PURSUANT TO A.R.S. § 38-431.01, THE GILA COUNTY BOARD OF SUPERVISORS WILL HOLD A MEETING AT THE GILA COUNTY COURTHOUSE, BOARD OF SUPERVISORS' HEARING ROOM, 1400 EAST ASH STREET, GLOBE, ARIZONA. ONE OR MORE BOARD MEMBERS MAY PARTICIPATE IN THE MEETING BY TELEPHONE CONFERENCE CALL OR BY INTERACTIVE TELEVISION VIDEO (ITV). THE MEETING IS ALSO TELEVISED TO THE GILA COUNTY TOMMIE CLINE MARTIN COMPLEX, BOARD OF SUPERVISORS' CONFERENCE ROOM, 707 S. COLCORD ROAD, PAYSON, ARIZONA.

Citizens may watch the Board meeting live-streamed at:
https://www.youtube.com/channel/UCkCHWVqrI5AmJKbvYbO-k2A/live

Citizens may submit written comments related to the October 25th Work Session Meeting agenda by no later than 5 p.m. on Monday, October 24th, by emailing to the Chief Deputy Clerk of the Board at mhenderson@gilacountyaz.gov or calling 928-402-4390. Citizens may also submit written comments during the meeting through YouTube. Please include the meeting date, agenda item number, your name, and residence address in the email.

WORK SESSION - TUESDAY, OCTOBER 25, 2022 - 10:00 A.M.

1. **CALL TO ORDER - PLEDGE OF ALLEGIANCE**

2. **REGULAR AGENDA ITEMS:**

   A. Information/Discussion to review the draft Ordinance No. 2022-08 - *Emergency Management Program*. **(Josh Beck)**

   B. Information/Discussion on Wildlife Feeding Education and/or Ordinance options for Gila County. **(Josh Beck)**

   C. Information/Discussion regarding revised Policy No. BOS-FIN-113 - *Procurement*. **(Mary Springer)**

   D. Information/Discussion to obtain guidance from the Board of Supervisors' and County Management on the preferred way to proceed on the Campaign Creek Buyout Project. **(Steve Sanders)**

3. **CALL TO THE PUBLIC:** A call to the public is held for public benefit to allow individuals to address the Board of Supervisors on any issue within the jurisdiction of the Board of Supervisors. Board members may not discuss items that are not specifically identified on the agenda.

Therefore, pursuant to Arizona Revised Statute § 38-431.01(H), at the conclusion of an open call to the public, individual members of the Board of Supervisors may respond to criticism made by those who have addressed the Board, may ask staff to review a matter or may ask that a matter be put on a future agenda for further discussion and decision at a future date.

4. At any time during this meeting pursuant to A.R.S. § 38-431.02(K), members of the Board of Supervisors and the County Manager may present a brief summary of current events. No action may be taken on the information presented.

IF SPECIAL ACCOMMODATIONS ARE NEEDED, PLEASE CONTACT THE RECEPTIONIST AT (928) 425-3231 AS EARLY AS POSSIBLE TO ARRANGE THE ACCOMMODATIONS. FOR TTY, PLEASE DIAL 7-1-1 TO REACH THE ARIZONA RELAY SERVICE AND ASK THE OPERATOR TO CONNECT YOU TO (928) 425-3231.

THE BOARD MAY VOTE TO HOLD AN EXECUTIVE SESSION FOR THE PURPOSE OF OBTAINING LEGAL ADVICE FROM THE BOARD'S ATTORNEY ON ANY MATTER LISTED ON THE AGENDA PURSUANT TO A.R.S. § 38-431.03(A)(3).

THE ORDER OR DELETION OF ANY ITEM ON THIS AGENDA IS SUBJECT TO MODIFICATION AT THE MEETING.

ARF-7608 **2. A.**

Work Session

Meeting Date: 10/25/2022
Submitted For: Josh Beck, Director
Submitted By: Celena Cates, Emergency Planner
Department: Health & Emergency Management
Division: Emergency Management

Information

Request/Subject

Discussion of a draft Ordinance No. 2022-08 - *Emergency Management Program.*

Background Information

In 2012, the Board of Supervisors approved (Gila County Resolution No. 05-09-12); the National Incident Management System (NIMS) as the practice model for the accomplishment of the significant responsibilities associated with prevention, preparedness, response, recovery, and mitigation of all major and hazards situations.

Gila County is authorized by Arizona Revised Statutes (A.R.S.) § 26-301 through § 26-319 to provide for emergency management within the jurisdiction of Gila County; to establish an emergency management agency within its jurisdiction; hereinafter referred to as Gila County Emergency Management; to appoint a director who shall be responsible for the organization, administration, and operation of the division.

The Emergency Management Ordinance No. 2022-08 will provide for the following:

1. Emergency Declarations and Powers of Authority
2. Emergency Management; Powers and Duties
3. Comprehensive Emergency Management and Response Plans
4. Emergency Operations Center
5. Volunteer Organizations

Evaluation

This ordinance will:

1. Prepare Gila County for emergencies resulting from a disaster or the imminent threat of a disaster, to establish a protocol for emergency management.
2. Establish the Gila County Emergency Management Division as the coordinating agency for all activity in connection with emergency management. This division may exercise authority and discharge responsibilities during disaster emergencies as vested in them by the Board.
3. Ensure utilization of all available County resources as reasonably necessary to cope with an emergency or disaster situation in Gila County.
4. Establish comprehensive emergency management plans for all County, local municipalities, and response agencies to utilize, upon activation of the Emergency Operations Center.

Conclusion

The adoption of the final Emergency Management Ordinance, No. 2022-08. will enable Gila County's primary and supporting agencies to adequately prevent, prepare, respond, recover, and mitigate all emergency or disaster situations.

Recommendation

The Health and Emergency Management Department Director recommends the review of the draft Ordinance No. 2022-08 - *Emergency Management Program*.

Suggested Motion

Information/Discussion to review the draft Ordinance No. 2022-08 - *Emergency Management Program*. **(Josh Beck)**

Attachments

EM Ordinance

GILA COUNTY ORDINANCE NO. 2022-08

AN ORDINANCE ESTABLISHING AN EMERGENCY MANAGEMENT PROGRAM; ACKNOWLEDGING AND PROVIDING FOR THE DUTIES AND RESPONSIBILITIES OF THE EMERGENCY MANAGEMENT DIVISION; GRANTING NECESSARY POWERS AND AUTHORITY TO COORDINATE ALL PHASES OF EMERGENCY MANAGEMENT IN GILA COUNTY; AUTHORIZING COOPERATIVE AND MUTUAL AID AGREEMENTS FOR RELIEF WORK BETWEEN GILA COUNTY, LOCAL JURISDICTIONS, OTHER COUNTIES AND STATE AND FOR RELATED PURPOSES.

WHEREAS, the Board of Supervisors is authorized by A.R.S. § 26-301 through 26-319 to provide for emergency management within the jurisdiction of Gila County; to establish an emergency management agency within its jurisdiction; hereinafter referred to as the Gila County Emergency Management Division; to appoint a director who shall be responsible for the organization, administration, and operation of the division; and

WHEREAS, in accordance with Gila County Resolution No. 05-09-12, the Board of Supervisors recognizes the National Incident Management System (NIMS) as the practice model for the accomplishment of the significant responsibilities associated with prevention, preparedness, response, recovery, and mitigation of all major and hazards situations; and

WHEREAS, the Board of Supervisors hereby declares that the preparation of comprehensive emergency management plans and the means for its implementation in Gila County from natural or human-caused disasters or threats thereof is immediately essential; and

WHEREAS, the Board of Supervisors further finds that an Ordinance should be adopted to protect the health and safety of persons and property during an emergency or disaster resulting from manmade or natural causes; and

NOW, THEREFORE, BE IT ORDAINED by the authority of the Gila County Board of Supervisors establishes the Emergency Management Division, the provision of emergency management in Gila County, and that the preparation and implementation of such plans are now imperative.

PASSED AND ADOPTED this ___ day of _____ 2022, at Globe, Gila County, Arizona

Attest: **GILA COUNTY BOARD OF SUPERVISORS**

_____ _____

James Menlove, Clerk of the Board Woody Cline, Chairman

Approved as to form:

_____

The Gila County Attorney's Office

SECTION 1: TITLE

This Ordinance shall be known as, referred to, or cited as, the Emergency Management Ordinance for Gila County.

SECTION 2: INTENT AND PURPOSE

2.1 To prepare the County for emergencies resulting from a disaster or the imminent threat of a disaster, it is necessary to establish a protocol for emergency management, conferring with the Board and others specified, pursuant to the powers and duties provided by this Ordinance.

2.2 To establish the Gila County Emergency Management Division as the coordinating agency for all activity in connection with emergency management. This division may exercise authority and discharge responsibilities during disaster emergencies as vested in them by the Board.

2.3 The role of any County department or agency, including the Emergency Management Division, in a declared emergency, as outlined within this Ordinance, unless otherwise specified by law, shall assist local units of government and local law enforcement agencies in responding to a disaster or the imminent threat of a disaster.

2.4 This Ordinance will not relieve any County Department of the legal responsibilities or authority given to it by local Ordinances, resolutions, or State regulations, nor will it adversely affect the work of any volunteer agency organized for relief in disaster emergencies.

SECTION 3: DEFINITIONS

As used in this Ordinance, capitalized terms shall have the following meaning:

3.1 **BOARD** means the County Board of Supervisors**.**

3.2 **DECLARATION OF EMERGENCY** as used in this Ordinance means a resolution stating a declaration of emergency issued by the Board, Chairman of the Board, or designee enacting some or all of the emergency powers addressed in this Ordinance.

3.3 **DIRECTOR** is the person who designates the day-to-day responsibility for the County's emergency management program and activities.

3.4 **COMMUNITY EMERGENCY RESPONSE TEAM (CERT)** is the volunteer organization of trained citizens, who have successfully completed a CERT course officially recognized by the Federal Emergency Management Agency.

3.5 **COMMUNITY WILDFIRE PROTECTION PLAN (CWPP)** means a community-based plan focused on identifying and addressing the local threat of wildfire. The plan determines what is at risk and provides a roadmap of actions for the community to address its wildfire risk.

3.6 **CONTINUITY OF GOVERNMENT (COG)** means the provision of the full range of governmental services of the three branches of government (judicial, legislative, and executive) at all levels (federal, state, and local).

3.7 **CONTINUITY OF OPERATIONS PLAN (COOP)** means an established plan to ensure the continuance of essential operations and relocation of personnel and resources to an alternate facility in the event of a catastrophic event.

3.8 **DISASTER** means any incident, natural or man-made, which causes the damage of sufficient severity and magnitude to warrant the County to issue a state of emergency proclamation to the Governor of the State of Arizona to supplement the efforts and request available resources to assist in protecting public health and safety, property, and/or harm to the environment.

3.9 **EMERGENCY** means any local incident, whether natural or man-made, which requires only local response action to protect public health and safety, property, and/or harm to the environment.

3.10 **EMERGENCY FUNCTIONS** as defined by A.R.S. § 26-301.5 includes warning and communications services, relocation of persons from stricken areas, radiological defense, temporary restoration of utilities, plant protection, transportation, welfare, public works and engineering, search or rescue, health and medical services, law enforcement, fire-fighting, mass care, resource support, urban search or rescue, hazardous materials, food, and energy information and planning and other activities necessary or incidental thereto.

3.10 **EMERGENCY MANAGEMENT** as defined by A.R.S. § 26-301.6, means the preparedness, response, recovery, and mitigation activities necessary to respond to and recover from disasters, emergencies or contingencies.

3.12 **EMERGENCY WORKER** as defined by A.R.S. § 26-301.7 means any person who is registered, whether temporary or permanent, paid or volunteer, with a local or state emergency management organization and certified by the local or state emergency management organization for the purpose of engaging in authorized emergency management activities or performing emergency functions, or who is an officer, agent or

employee of this state or a political subdivision of this state and who is called on to perform or support emergency management activities or perform emergency functions.

3.13 **EMERGENCY OPERATIONS CENTER (EOC)** means the physical location at which the coordination of information and resources to support incident management (on-scene operations) activities normally takes place. An EOC may be a temporary facility or a permanently established facility.

3.14 **EMERGENCY OPERATIONS PLAN (EOP)** as defined by the Federal Emergency Management Agency's (FEMA) Comprehensive Preparedness Guide (CPG) 101, means the ongoing plan maintained by various jurisdictional levels for responding to a wide variety of potential hazards. It describes how people and property will be protected; details who is responsible for carrying out specific actions; identify the personnel, equipment, facilities, supplies, and other resources available; and outlines how all actions will be coordinated.

3.15 **INCIDENT COMMAND SYSTEM** is a standardized hierarchical structure that allows for a cooperative response by multiple agencies, both within and outside of government, to organize and coordinate response activities without compromising the decision-making authority of the local command.

3.16 **LOCAL EMERGENCY** as defined by A.R.S. § 26-301.10 means the existence of conditions of disaster or of extreme peril to the safety of persons or property within the territorial limits of a county, city, or town, which conditions are or are likely to be beyond the control of the services, personnel, equipment and facilities of such political subdivision as determined by its governing body and which require the combined efforts of other political subdivisions.

3.17 **LOCAL EMERGENCY PLANNING COMMITTEE (LEPC)** is a community-based organization that assists in preparing for emergencies, and developing strategies to prevent, respond to and mitigate hazardous materials releases in their local community.

3.18 **MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN (MJHMP)** as defined by FEMA is a plan prepared jointly by more than one jurisdiction and may include any county, municipality, city, town, township, school district, or other special districts, council of governments or other regional organization, Indian tribe or Alaska Native village, or unincorporated areas.

3.19 **REGULATIONS** mean plans, programs, and other emergency procedures deemed essential to emergency management.

3.20 **STATE OF EMERGENCY** as defined by A.R.S. § 26-301.15 means the duly proclaimed existence of conditions of disaster or of extreme peril to the safety of persons or property within the state caused by air pollution, fire, flood or floodwater, storm, epidemic, riot, earthquake or other causes, except those resulting in a state of war emergency, which are or are likely to be beyond the control of the services, personnel, equipment and facilities of any single county, city or town, and which require the combined efforts of the state and the political subdivision.

3.21 **VOLUNTEER** means contributing a service, equipment, or facilities to the Emergency Management Division without remuneration.

SECTION 4: EMERGENCY DECLARATIONS & AUTHORATIVE POWERS

4.1 A state of emergency shall be deemed to exist whenever during times of public crisis, disaster, rioting, catastrophe, similar public emergency, or for any reason, public safety authorities are unable to maintain public order or afford adequate protection for lives, safety, or property, or whenever the occurrence of any such condition is imminent.

4.2 In the event of an existing or threatened state of emergency endangering the lives, safety, health, and welfare of the people within the County or any part thereof, or threatening damages to or destruction of property, the Board or delegated authority is hereby authorized and to issue a public declaration declaring to all persons the existence of such a state of emergency, and, in order to more effectively protect the lives and property of people within the County, to place in effect any or all of the restrictions authorized in this Ordinance.

4.3 Declaration of Emergency

4.3.1 If disaster conditions exist or are likely to, the Chairperson of the Board or delegated authority may issue a declaration of emergency resolution.

4.3.2 If a declaration of emergency is proclaimed, the County Manager or Emergency Management Director shall provide the Board with a preliminary damage assessment as soon as the assessment is available. Municipalities therein may proclaim individual disasters upon request of their respective governing authorities.

4.3.3 Upon a declaration, the Gila County Emergency Operations Plan or such component parts thereof, as may be relevant to the emergency shall be activated and implemented.

4.3.4 The declaration of emergency shall continue until the Board, after consultation with the Emergency Management Director, finds that emergency conditions no longer exist, at which time, the Chairman of the Board may, by resolution, terminate a declaration of emergency.

4.3.5 Any resolution declaring, continuing, or terminating an emergency shall be given prompt and general publicity and shall be filed promptly in the Clerk of the Board's office and submitted to the Arizona Department of Emergency and Military Affairs (DEMA).

4.4 Lines of Succession for Emergency Declarations

4.4.1 **County Board Chairperson:** The Chairperson of the County Board is empowered to declare an emergency, as an emergency is defined in this Chapter.

4.4.2 **Alternates:** In the absence of the Chairperson, alternates in the line of succession are:

a) County Manager
b) County Sheriff
c) County Emergency Management Director

4.5 Exclusion from Applicability

This Ordinance shall not apply within the incorporated city/town jurisdictions or within any area of the County over which the municipality has jurisdiction to enact general police power ordinances unless the municipality by resolution consents to its application or the local delegated authority of the municipality has requested its application, in which event it shall apply to such areas as fully and to the same extent as elsewhere in the county.

4.6 Declaration Imposing Prohibitions and Restrictions

4.6.1 Pursuant to A.R.S. § 26-311, if an emergency is declared, the Chairman of the Board or delegated municipal authority shall govern by resolution and shall have the authority to impose all necessary regulations to preserve the peace and order of the city, town, or unincorporated areas of the County, including but not limited to:

a) To utilize all available County resources as reasonably necessary to cope with an emergency, including the transfer and direction of personnel or functions of

County agencies or units thereof for the purpose of performing or facilitating emergency services.

b) To direct and compel the evacuation of all or part of the population from any stricken or threatened area within the County, to prescribe routes, modes of transportation, and destinations in connection with evacuation; and to control ingress and egress of a disaster area, the movement of persons within the area, and the occupancy of premises therein.

c) To impose a curfew, as necessary, prohibiting in certain areas and during certain periods the appearance in public of anyone who is not a member of an exempted class. The declaration shall state the exempted classes and the restrictions from which each is exempted. The declaration shall specify the geographical areas and the period during each twenty-four (24) hour day to which the curfew applies. Unless otherwise specified in the declaration, the curfew shall apply during the specified period each day until the Board or delegated authority by declaration removes the curfew.

d) To prohibit, as necessary, the possession or consumption of any alcoholic beverage, including beer, wine, and spirituous liquor, other than on one's own premises, and may prohibit the transfer, transportation, sale, or purchases of any alcoholic beverage within the area of the County described in the declaration.

e) To prohibit, as necessary, transportation or possession of one's own premises, or the sale or purchase of, any dangerous weapon or substance. The Board or delegated authority may exempt from some or all of the restrictions' classes of people whose possession, transfer, or transportation of certain dangerous weapons or substances is necessary to the preservation of the public's health, safety, or welfare. The declaration shall state the exempted classes and the restrictions from which each is exempted.

f) To establish, as necessary a system of economic controls overall resources, materials, and services to include food, clothing, shelter, fuel, rents, and wages, including the administration and enforcement of any rationing, price freezing, or similar state and federal order or regulation.

g) To establish, as necessary, restrictions on, pedestrian and vehicular movement, standing, and parking, except for the provision of designated, essential services, such as fire, police emergency medical services, and hospital services, including the transportation of patients, utility emergency repairs and emergency calls by physicians.

h) To perform and exercise such other functions, powers, and duties as are necessary to promote and secure the safety and protection of the civilian population.

i) To relieve any public official having administrative responsibilities under this Ordinance of such responsibilities for willful failure to obey an order, rule, or regulation adopted pursuant to this section.

4.6.2 Any proclamation declaring the existence of a state of emergency, and all restrictions and prohibitions imposed as a result of the declaration, shall apply in all areas of Gila County unless otherwise specified in the proclamation.

SECTION 5: EMERGENCY MANAGEMENT DIVISION; POWERS AND DUTIES

The Emergency Management Division shall consist of a director, manager, and other members as deemed necessary.

5.1 Emergency Management Director (or designee)

5.1.1 The Emergency Management Director or designee may be appointed by and serve at the pleasure of the County Manager and the Board.

5.1.2 The general powers and duties of the director or designee shall include, but are not limited to the following:

a) Shall have the legal authority to exercise the powers and discharge the duties conferred upon the Emergency Management Division, including the implementation of the emergency operations plan, coordination of the emergency responses of public and private agencies and organizations, coordination of recovery efforts with local and county officials, and inspection of emergency or disaster sites.
b) When necessary, shall coordinate and prepare a declaration of emergency and submit to the Board for approval.
c) Supervision of the development and approval of all emergency management plans; assuring plans address all hazards and include all cities, towns, and other population centers within the county.
d) Direction and control of the operations of the Emergency Management Division as well as the training of division personnel.
e) Establish an Emergency Operations Center ("EOC") as a central location from which key officials can direct and control operations during a disaster or emergency.
f) Assume and secure responsibility for public relations, information, and education regarding all phases of emergency management.

g) Supervision of, and final authorization for the procurement of all necessary supplies and equipment, for the purpose of improving emergency management and EOC activities within the County.

5.2 Emergency Management Manager (or designee)

5.2.1 The Gila County Emergency Management Division shall be under the supervision and control of the Gila County Emergency Management Director.

5.2.2 The duties of the manager or designee shall include, but are not limited to the following:

a) Develop and maintain emergency management plans consistent with State and Federal requirements.
b) Maintain liaison and coordinate with all other affected agencies, public, private, and nongovernmental organizations.
c) Coordinate the recruitment of volunteer personnel and agencies to augment County personnel and facilities for emergency management purposes.
d) Design and conduct exercises of the adopted emergency management plan as required by state and federal mandates.

SECTION 6: EMERGENCY MANAGEMENT PLANS

6.1 Emergency Management Plans

6.1.1 Comprehensive emergency management and response plans shall be adopted and maintained by resolution of the Board. In the preparation of these plans as they pertain to Gila County, it is intended that the services, equipment and facilities, and personnel of all existing and future departments/agencies shall fully be utilized. Upon approval of the plans, all departments/agencies shall be responsible for performing the functions assigned by these plans and maintaining their portions of the plans in a current state of readiness.

6.1.2 The emergency management plans shall be considered supplementary to this Ordinance and have the effect of law during the time of a disaster. Gila County emergency management plans include, but are not limited to the following:

a) Emergency Operations Plan (EOP); includes Emergency Support Function (ESF) Annexes, Incident Annexes, and Support Annexes; *A.R.S. § 26-308*

Powers of Local Government; Local Emergency Management Establishment; Organization.

b) Gila County Hazardous Materials Response Plan; *SARA Title III and the Arizona Revised Statutes Emergency Planning and Community Right to Know Act.*
c) Multi-Jurisdictional Hazard Mitigation Plan; *44 CFR § 201.6., Local Mitigation Plans.*
d) Continuity of Operations Plan; *National Continuity Policy Implementation Plan (NCPIP) and the National Security Presidential Directive51/Homeland Security Presidential Directive20 (NSPD-51/HSPD-20).*
e) Northern/Southern Gila County Community Wildfire Protection Plans; *Healthy Forests Restoration Act (HFRA) of 2003.*

6.1.3 The emergency management plans shall require the use of the Incident Command System (ICS) by all emergency response agencies during a declaration of emergency.

6.1.4 Each department/agency assigned responsibility in the EOP shall be responsible for carrying out all duties and functions assigned therein. In addition, all ESF, Incident and Support Annexes primary/coordinating agencies, emergency service organizations, and supporting agencies within the County shall:

a) Adopt, implement, utilize and train personnel in accordance with NIMS and its incorporated Incident Command System (ICS) as developed and implemented by the United States Department of Homeland Security for responding to, managing, and coordinating multiple agency or multiple jurisdiction incidents, emergencies and disasters whether single or multiple disciplines.
b) Develop and maintain departmental/agency Standard Operating Procedures (SOPs), response plans, guides, or checklists to support emergency management and response activities.
c) Continually maintain their portion of emergency management plans in a current state of readiness.

6.1.5 Amendments to these plans shall be submitted to the Emergency Management Director. Upon approval, the Director will then submit the amendments to the Board with his/her recommendation for their approval.

6.1.6 All emergency management plans shall not be in effect until adopted by the Board.

6.2 Orders of Succession

6.2.1 All emergency management/response plans that distinguish key positions with authoritative powers and responsibilities, as defined in this Ordinance, shall provide for continuity of operations and lines of succession required in an emergency. In each instance, this shall include, but may not be limited to:

a) Identify and prioritize essential business functions.
b) Identify and safeguard essential records and databases.
c) Determine a line of succession for essential positions.
d) Identify alternate business facilities and alternate EOC's.

6.2.2 In each instance, the responsible person will designate and keep on file with the director a current list of three persons as successors to his/her position. The list will be in the order of succession and will designate a minimum of three (3) persons best capable of carrying out all assigned duties and functions.

SECTION 7: EMERGENCY OPERATIONS CENTER

7.1 Emergency Operations Center (EOC)

7.1.1 The Gila County Emergency Management Division maintains a dedicated Emergency Operations Center (EOC) to manage and coordinate major emergencies or disasters.

7.1.2 The EOC Manager or designee shall assure that all county employees and rostered volunteers with responsibilities as part of the emergency management plan(s) receive training in the functions that are to perform under the plan.

7.1.3 When a required competency or skill or a disaster function is not available within the County, the EOC Manager or designee is authorized to seek assistance from the State. The assignment of duties shall also include the granting of authority for the persons so assigned to carry out such duties prior to, during, and after, the occurrence of a disaster.

7.1.4 The EOC shall include dedicated telephones, computers, radio terminals, conference rooms, bathrooms, and office areas.

7.1.5 An alternate EOC will be activated only when the primary EOC is damaged, or inaccessible, and/or evacuation of EOC staff members becomes necessary.

7.1.6 The level of EOC staffing will vary with the specific emergency situation.

SECTION 8: VOLUNTEER ORGANIZATIONS

8.1 Local Emergency Planning Committee

8.1.1 The Local Emergency Planning Committee; hereinafter, referred to as the "LEPC," shall consist of a representation of elected state and local officials, law enforcement, emergency management, firefighting personnel, first aid/EMS personnel, public health personnel, local environmental personnel, hospital personnel, transportation personnel, broadcast and print media personnel, community groups and owners or operators of local facilities.

8.1.2 The LEPC shall develop a hazardous material response and preparedness plan for local and county jurisdictions, establish procedures for conducting its public information and education responsibilities and assist local and county emergency response agencies in the development of emergency management plans.

8.1.3 The LEPC shall establish and maintain bylaws pursuant to the requirements cited in Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA); also referred to as the Emergency Planning and Community Right-to-Know Act (EPCRA); and the revised Arizona Statutes § 26-344 through § 26-345 of 2008.

8.2 Community Emergency Response Team

8.2.1 The Community Emergency Response Team, hereinafter, referred to as "CERT" shall be comprised of qualified, community volunteers.

a) Northern Gila County CERT volunteers shall be under the supervision and control of the Gila County Sheriff's Office.
b) Southern Gila County CERT volunteers shall be under the supervision and control of the Emergency Management Manager or designee.

8.2.2 The CERT program shall provide volunteer services in the areas of natural and other disasters under the direction of their respective County agency, to supplement and assist emergency management and response activities.

8.3 Radio Amateur Civil Emergency Service

8.3.1 The Radio Amateur Civil Emergency Service, hereinafter, referred to as RACES is a public service provided by a volunteer organization of licensed amateur radio operators who donate time, energy, skills, and use of personal equipment for public service within Gila County.

8.3.2 The Federal Communications Commission (FCC) is responsible for the regulation of RACES operations [FCC Rules and Regulations, Part 97, Subpart E, Section 97.407]. RACES is administrated by a local, county, or state civil defense agency responsible for disaster services.

8.3.3 The Federal Emergency Management Agency (FEMA) provides planning, guidance, and technical assistance for establishing a RACES organization within Gila County.

8.3.4 In the event of a significant emergency/disaster situation where normal communications systems have sustained damage or when additional communications are required, the Gila County Emergency Management Division shall activate RACES volunteers.

SECTION 9: LIABILITY

9.1.1 This Ordinance is an exercise by Gila County as its governmental functions for the protection of the public peace, health, and safety; and neither the County agents and representatives, if some, or any individual receiver, firm, partnership, corporation, association, or trustee, or any of the agents thereof in good faith carrying out, complying with or attempting to comply with any order, rule or regulation promulgated pursuant to the provisions of this Ordinance, shall be liable for any damage sustained to person or property as the result of said activity.

9.1.2 A.R.S § 26-314 and §36-790 provides volunteers with immunity from civil and criminal liability if acting in good faith if the volunteer is both registered with the State or local emergency management agency and is certified to support emergency management functions including mass dispensing.

9.1.3 CFR Title 42, Chapter 139, Section 14503 Limitation on liability for volunteers. Except as provided in subsections (b), (c), and (e), No volunteer of a nonprofit organization or governmental entity shall be liable for harm caused by an act or omission of the volunteer on behalf of the organization or entity if:

a) The volunteer was acting within the scope of the volunteer's responsibilities in the nonprofit organization or government entity at the time of the act or omission;
b) If appropriate or required, the volunteer was properly licensed, certified or authorized by the authorities for the activities or practice in the State in which the harm occurred, where the activities were, or practice was undertaken within the scope of the volunteer's responsibilities in the organization or entity;
c) The harm was not caused by willful or criminal misconduct, gross negligence, reckless misconduct, or a conscious, flagrant indifference to the rights or safety of the individual harmed by the volunteer; and,
d) The harm was not caused by the volunteer operating a motor vehicle, vessel, aircraft, or other vehicle for which the State requires the operator or the owner of the vehicle, craft, or vessel to possess an operator's license or maintain insurance.

SECTION 10: EXPENDITURES

Any expenditure made in connection with such emergency activities, including mutual aid activities, shall be deemed conclusively to be for the direct protection and benefit of the inhabitants and property of the County.

SECTION 11: VIOLATIONS

It shall be a misdemeanor for any person to violate any of the provisions of this Ordinance or plans issued pursuant to the authority contained herein, or to willfully obstruct, hinder or delay any member of the emergency management organization as herein defined in the enforcement of the provisions of this Ordinance or any plan issued thereunder.

SECTION 12: SEVERABILITY

Should any provision of this Ordinance be declared invalid for any reason, such declaration shall not affect the validity of other provisions, or of this Ordinance, as a whole, it being the legislative intent that the provisions of this Ordinance shall be severable and remain valid notwithstanding such declaration.

SECTION 13: CONFLICTING RULES AND REGULATION

Should any provision of this Ordinance be declared invalid for any reason, such declaration shall not affect the validity of other provisions, or of this Ordinance, as a whole, it being the legislative

intent that the provisions of this Ordinance shall be severable and remain valid notwithstanding such declaration.

ARF-7609 **2. B.**

Work Session

Meeting Date: 10/25/2022
Submitted For: Josh Beck, EM/PHEP Manager
Submitted By: Josh Beck, Director
Department: Health & Emergency Management Division: Health Services

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Information

Request/Subject

Information and Discussion on Wildlife Feeding Education and/or Ordinance options for Gila County

Background Information

In a previous Board of Supervisors meeting, during the public comment section, concerned residents spoke about the increasing amount of dangerous human/wildlife interactions in northern Gila County. These comments align with the data that has been shared by the Arizona Game and Fish Department. A thorough review of concerns has been researched and discussed between Arizona Game and Fish and Gila County Animal Care and Control. The findings will be shared to begin the discussion around the topic of wildlife feeding.

Evaluation

The benefits and detriments of wildlife feeding practices in northern Gila County have been researched and discussed. The information gathered is ready to be presented to the Board of Supervisors, for discussion on the best path forward.

Conclusion

Once presented with the research and information gathered about wildlife feeding practices, the Board of Supervisors will have the information available for the discussion on the best path forward for the residents and wildlife to address the wildlife/human balance in northern Gila County.

Recommendation

The Health and Emergency Management Department Director recommends the Board of Supervisors weigh the barriers and benefits to the options available for decreasing the frequency of dangerous wildlife/human interactions in Gila County.

Suggested Motion

Information/Discussion on Wildlife Feeding Education and/or Ordinance options for Gila County. **(Josh Beck)**

Attachments

Wildlife Presentation
Potential Draft-Wildlife Feeding Ordinance
Gila County Bear Ordinance
Cochise County Ordinance
Navajo County Ordinance
Yavapai County Ordinance
Show Low City Code
Flagstaff Ordinance
Research on Feeding
HUman Animal Interaction Fatalities
Wildlife Tourism
Vector Diseases
Feeding Wildlife Impacts
Wildlife Health

Gila County Wildlife Feeding

Gila County
Health & Emergency Management
Prevent. Promote. Protect.

History

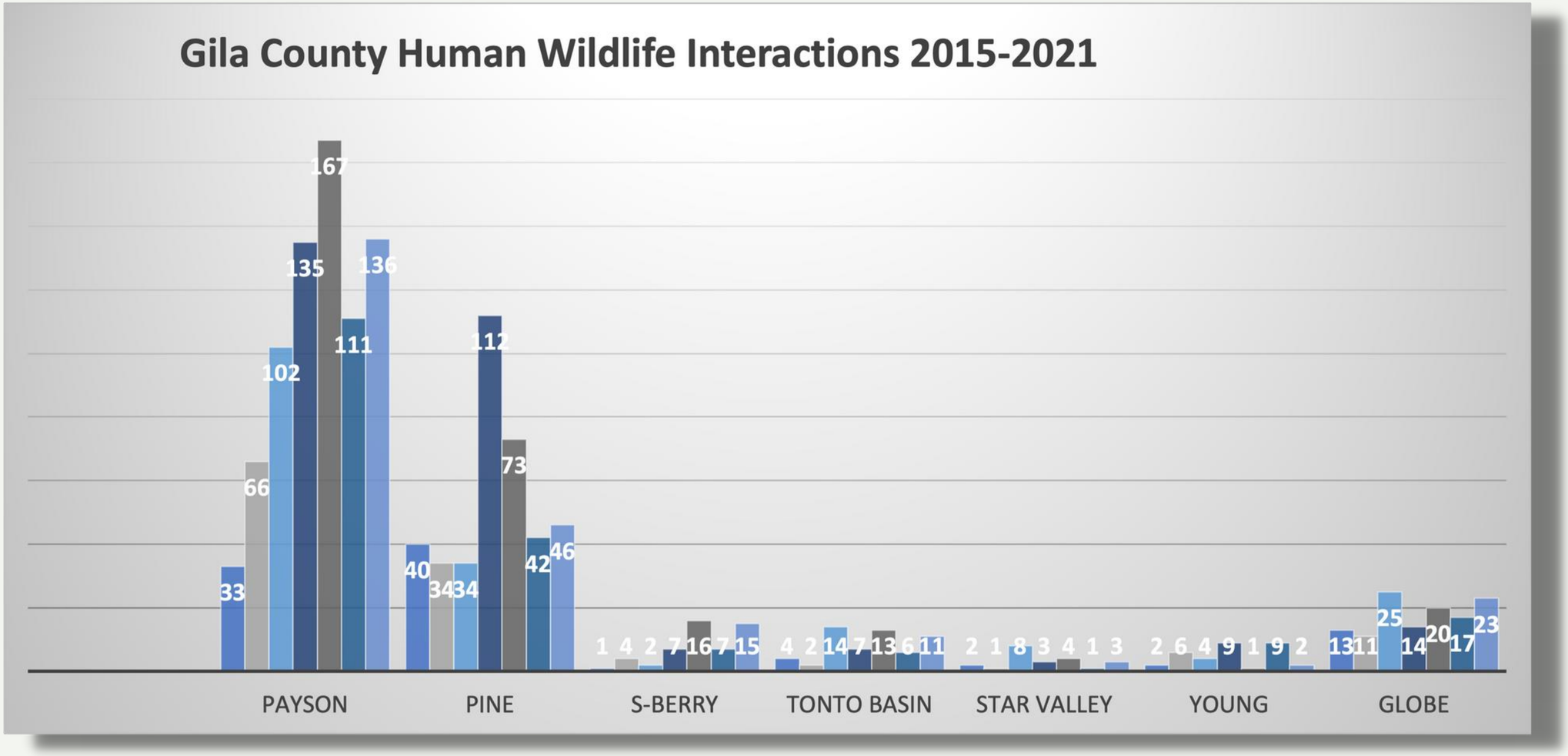
Statewide restriction on feeding wildlife introduced in 2006 restricting feeding wildlife in areas with population greater than 280,000. ARS. 13-2927

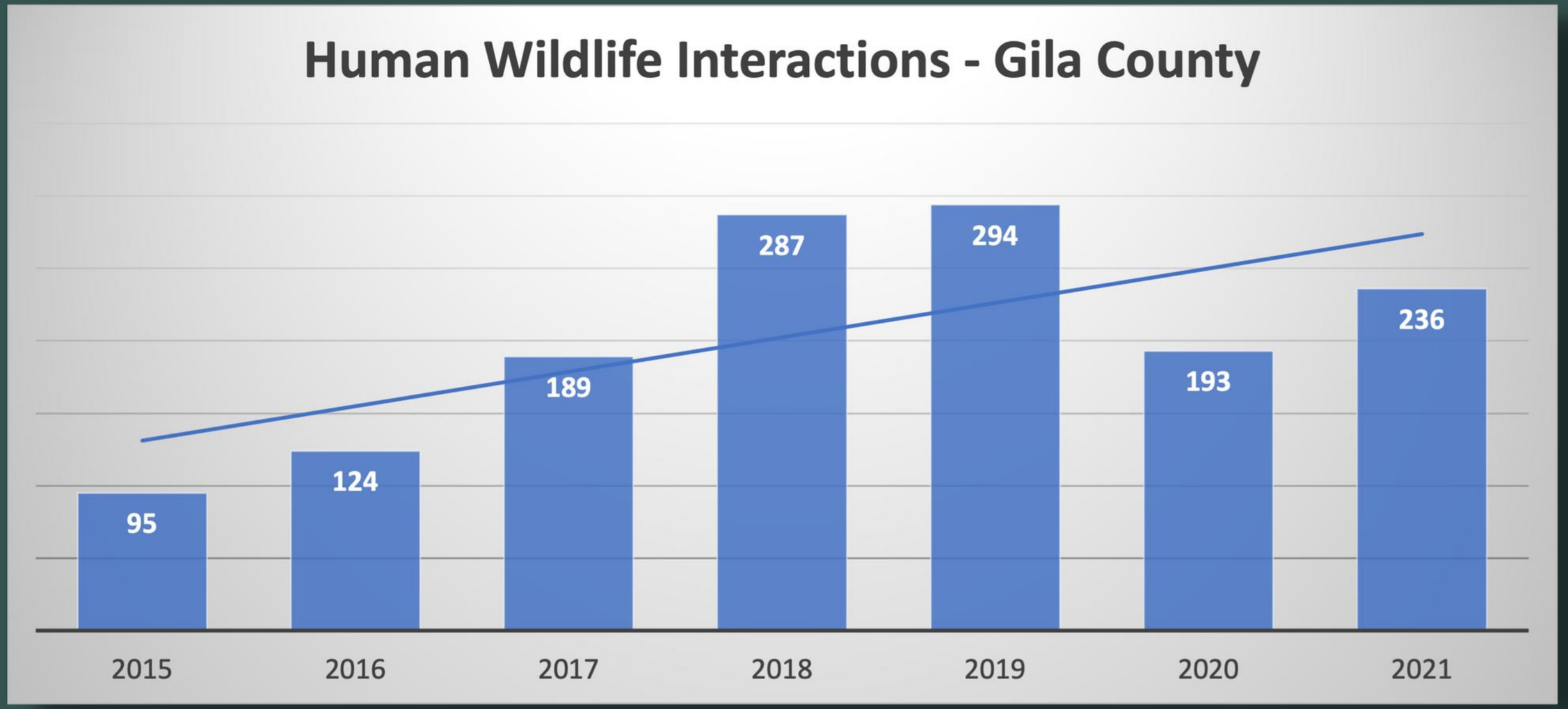
Gila County is more remote and less populated and likely will never reach this number

2001 – Current ordinance in unincorporated Gila County restricts feeding/attracting bears for public safety

2011 – Knolls subdivision – cease and desist/public nuisance
Human wildlife interactions increasing since 2015 linearly

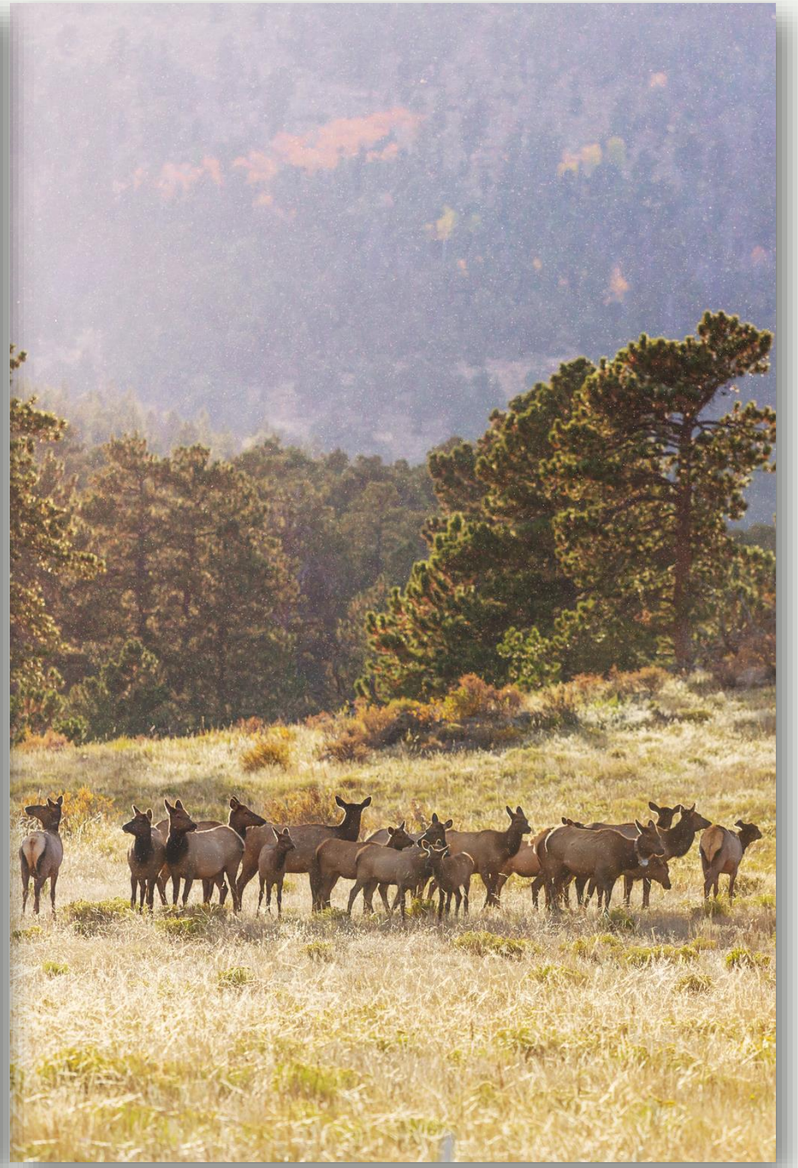
Statistics


Gila County Human Wildlife Interactions 2015-2021
33
66
102
135
167
111
136
40
34
34
112
73
42
46
1 4 2 7 16 7 15
4 2 14 7 13 6 11
2 1 8 3 4 1 3
2 6 4 9 1 9 2
13 11 25 14 20 17 23
PAYSON
PINE
S-BERRY
TONTO BASIN
STAR VALLEY
YOUNG
GLOBE


Human Wildlife Interactions - Gila County
95
124
189
287
294
193
236
2015
2016
2017
2018
2019
2020
2021

INCIDENTS

- **2017** – Payson Javelina bite
- **2018** – Payson Elk Attack (let calf out of yard and cow trampled her)
- **2020** – Pine Elk Attack – Lucy
- **2021** – Pine Elk Attack – Hand feeding carrots
- **2022** – Rumsey Park Elk
- **2022** – Pine Elk Attack – 9 year old
- **2022** – Pine Elk Attack – Husband, Wife and dog were all injured by cow elk



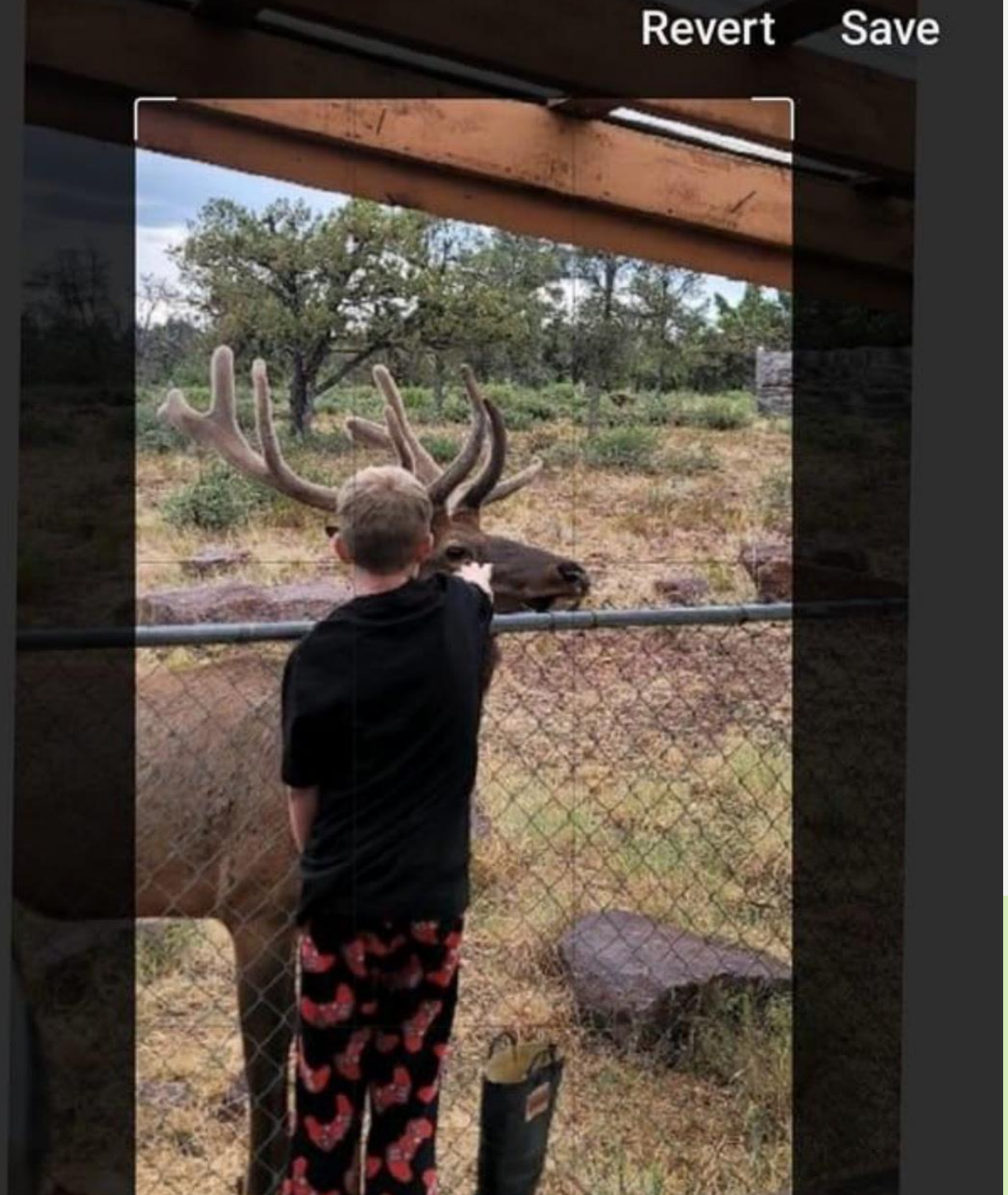
THE PROBLEM

Persistent feeding and watering of wildlife is habituating these wild animals into our communities where they are losing their natural fear of humans. This is leading to more wildlife/human conflicts in our rural communities within Gila County.

To compound matters, these habituated wildlife are raising their offspring within these areas and their young are not only being taught the same things, but also never leaving the area and continuing the cycle.

The increased number of elk and deer within our communities also increases the chances of larger predatory wildlife interactions, especially during fawning and calving season. It also increases the chance of aggressive behavior during mating season.


VETERAN


Revert
Save

9:42 5G 93%

Posts

Payson,AZ local community news and chat

Craig Miller · 1h ·

C'mon! Does that look like my mouth?

7:50 5G 92%

Posts

Payson,AZ local community news and chat

Michael Friend · 1h ·

This youngster came in our yard a few minutes ago. I always have some sweet feed in the tub to discourage pruning of the roses and shrubs. She sampled everything anyway.

SIMILAR ORDINANCES

- City of Flagstaff
- Cochise County
- Pinal County (State Law)
- Maricopa County (State Law)
- Pima County (State Law)
- Yavapai (Within Prescott City)
- Surprise

LOCAL SUPPORT FOR FEEDING RESTRICTIONS

- Gila County Sheriffs Office
- Payson Police Department

ONE SOLUTION

Increased Education
Continue to get the word out: social media posts, additional print articles, door-to-door flyers or mailers. Host additional town halls, work with VRBO’s, classes for school age children.

ANOTHER SOLUTION

Enact a County ordinance that restricts feeding and watering wildlife within Gila County. This ordinance would exclude feeding tree squirrels and birds as long as certain precautions were made to keep the feed out of reach of other wildlife. Gila County currently has an ordinance that restricts feeding or attracting bears for public safety. This new ordinance would replace the current one to include all wildlife.

QUESTIONS?

WHEREAS, the Board of Supervisors, pursuant to A.R.S § 11-251 and § 11-251.02, may make and enforce all local, police, and sanitary regulations, not in conflict with general law; and

WHEREAS, the frequency of wildlife/human contacts within Gila County are escalating and pose a potential threat to the welfare and safety of the public and to the welfare and safety of the wildlife; and

WHEREAS, the Board of Supervisors has determined that the intentional, negligent, or reckless placing, storing or discarding of garbage, refuse, human and animal food or edible materials contributes to the frequency of wildlife/human contacts.

NOW, THEREFORE, BE IT ORDAINED that the Gila County Board of Supervisors supports the enforcement of regulations for wildlife/human contacts, as follows.

SECTION 1. Wildlife Regulations

Subsections:

1.01 Definitions

A. "Feeding" or "to feed" is defined as placing edible materials in a location where it can be consumed by wildlife.
B. "Attracting" or "to attract" is defined as placing edible material in a location likely to entice wildlife to the source of the edible material.
C. "Edible Material" means any water, human or animal food, food byproduct, refuse, or garbage.
D. "Wildlife" means all wild mammals.
E. "Public Officials" means any Federal, State, County, or Town employees.

1.02 Feeding or attracting wildlife prohibited

It is unlawful for any person to intentionally feed wildlife, or to attract wildlife by intentionally, negligently, or recklessly placing edible material in a place that is physically accessible to wildlife.

1.03 Applicability

This section applies to all areas including those areas within any Federal, State, or National Park Lands that lie within the geographical boundaries of Gila County.

1.04 Exceptions

This ordinance does not apply to:

A. Public Officials, or their authorized agents, acting pursuant to A.R.S. Title 17 or Game and Fish Commission rule or order or acting within the scope of their authority for public safety or wildlife management purposes.
B. Edible material located within a residence, closed vehicle, fully closed storage structure, or fully secured trash container that prevents wildlife from opening.
C. Normal agricultural or livestock operational practices or any person feeding their own horses or domestic animals
D. Seeds, nectar, and other material for birds or tree squirrels that are placed specifically for attracting wild birds and/or tree squirrels in such a manner as to make it inaccessible to other wildlife.
E. Water features such as fountains, ponds, birdbaths, or similar structures where the primary purpose is decorative or ornamental.
F. Water sources, salt or salt-based materials produced and manufactured for the livestock industry placed ¼ mile outside of residential areas where the attraction of wildlife does not pose a risk to public safety.
G. Growing plants or parts of growing plants, including gardens and fruit-bearing trees, and the parts of those plants that may have fallen to the ground.

1.05 Enforcement

An Animal Control Officer or any state-certified Peace Officer may issue a written warning or citation for a violation of this ordinance.

1.06 Separate Offenses

Each violation pursuant to this section shall constitute a separate offense and each day a violation remains unabated may constitute a separate offense.

1.07 Penalties

1. Upon the first violation of this section, an officer shall issue a written warning and provide the person with wildlife educational materials.

4. Upon a second violation of this section and the person has previously been issued a warning, it is a class XXX misdemeanor, plus any other penalties, assessments, or surcharges authorized by law.

Section 2. That all ordinances and parts of ordinances in conflict with this ordinance be hereby repealed to the extent of that conflict.

After recording, please deliver to: Marian Sheppard, BOS

ORDINANCE

No. 01-1

AN ORDINANCE OF THE BOARD OF SUPERVISORS OF GILA COUNTY, ARIZONA, WHICH REGULATES CONTACT BETWEEN BEARS AND HUMANS WITHIN UNINCORPORATED GILA COUNTY IN AN EFFORT TO PROTECT THE WELFARE AND SAFETY OF THE PUBLIC AND OF THE BEARS.

WHEREAS, the Board of Supervisors, pursuant to A.R.S. §11-251 and §11-251.05, may make and enforce all local, police and sanitary regulations not in conflict with general law; and

WHEREAS, the frequency of bear/human contacts within unincorporated Gila County are escalating and pose a potential threat to the welfare and safety of the public and to the welfare and safety of the bears; and

WHEREAS, the Board of Supervisors has determined that the intentional, careless, negligent or reckless placing, storing or discarding of garbage, refuse, human and animal food or edibles contributes to the frequency of bear/human contacts.

NOW, THEREFORE, BE IT ORDAINED that the Gila County Board of Supervisors supports the enforcement of regulations for bear/human contacts, as follows:

SECTION 1. Bear regulations

Subsections:

1.01 Definitions

A. "Feeding" is defined as the intentional placing of water, animal or human food, or edibles to a bear or bears.

B. "Attracting" is defined as placing water, animal or human food, edibles, garbage or refuse in an area where a reasonable person would be aware of the potential presence of bears.

1.02 Feeding or attracting bears prohibited

It is unlawful for any person to intentionally feed a bear or bears, or to attract bears by intentionally, negligently or recklessly placing water, garbage, refuse, human or animal food, or edibles in a place that is physically accessible to bears.

1.03 Applicability

This section applies within all unincorporated areas of Gila County, including, but not limited to, those areas within any Federal Land, or State, or National Park that lie within the geographical boundaries of unincorporated Gila County.

1.04 Exceptions

This ordinance does not apply to:

A. Public employees acting within the scope of their authority for public safety or wildlife management purposes.
B. Feeding or attracting bears as permitted by Arizona law and the Arizona Game and Fish Commission.
C. Food or edibles that are being transported, consumed or prepared for consumption.
D. Garbage or refuse that is being transported.
E. Water, food, edibles, garbage or refuse located in a residence, sealed vehicle or storage building, or in a camping unit that is constructed of solid, non-pliable material.
F. Food edibles, garbage or refuse suspended at least ten feet above the ground and four feet horizontally from a post, tree trunk or other object on which a bear may climb.
G. Food, edibles, garbage or refuse stored in a covered and locked container made of sturdy, non-pliable material.
H. Municipal and commercial zoos.
I. Provision of feed for livestock, horses, swine, poultry or foul.

1.05 Enforcement

An animal control officer and any state certified peace officer may issue a citation for the violation of this ordinance.

1.06 Separate offenses

Each violation pursuant to this section shall constitute a separate offense and each day a violation remains unabated may constitute a separate offense.

1.07 Penalty

A violation of this section constitutes a Class I misdemeanor and is punishable by a fine of not less than $ 500.00, nor more than $ 2500.00, 6 months in jail, 3 years of probation, or any combination thereof

SECTION 2. That all ordinances and parts of ordinances in conflict with this ordinance be hereby repealed to the extent of such conflict.

SECTION 3. That if any part of this ordinance is for any reason held to be invalid or unconstitutional by the decision of a court competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

SECTION 4. Due to the summer recreation season and the recent bear encounters, this ordinance is enacted as an emergency measure to be effective immediately.

PASSED AND ADOPTED this 10th day of July 2001.

GILA COUNTY BOARD OF SUPERVISORS

Cruz Salas, Chairman

ATTEST:

Steven L. Besich, Clerk

APPROVED AS TO FORM:

James Hazel, Jr., County Attorney

Board of Supervisors

RESOLUTION 08-06

A RESOLUTION OF THE COCHISE COUNTY BOARD OF SUPERVISORS ADOPTING AN ORDINANCE REGULATING CONTACT BETWEEN WILDLIFE AND HUMANS WITHIN COCHISE COUNTY IN AN EFFORT TO PROTECT THE WELFARE AND SAFETY OF THE PUBLIC

WHEREAS, by Arizona Revised Statutes Title 17, the Arizona Game and Fish Commission is established and tasked with the responsibility to manage wildlife in Arizona; and

WHEREAS, the Board of Supervisors, pursuant to A.R.S. § 11-251.31, may make and enforce all local, police and sanitary regulations not in conflict with general law; and the issue of humans feeding wildlife and leaving human food and garbage available for wildlife has created and continues to create public safety concerns; and

WHEREAS, the frequency of wildlife/human public safety conflicts within Cochise County are escalating and pose a potential threat to the welfare and safety of the public; and

WHEREAS, the attraction of javelina, a primary prey animal for mountain lions, tends to attract mountain lions into the communities where these animals are being fed, and mountain lions are predators that have harmed humans in our state in the past by predatory attacks; and

WHEREAS, the Board of Supervisors has determined that the intentional, careless, negligent or reckless placing, storing or discarding of garbage, refuse, human and animal food or edibles contributes to the frequency of potentially dangerous contacts between humans and wildlife such as bears, coyotes, and mountain lions,

NOW, THEREFORE, BE IT RESOLVED that the Cochise County Board of Supervisors hereby adopts the Ordinance regulating contact between Wildlife and Humans Within Cochise County in form and substance as attached hereto. Said Ordinance shall become effective thirty (30) days after the date hereof.

Cochise County • 1415 Melody Lane, Building G • Bisbee, Arizona 85603
(520) 432-9200 • FAX: (520) 432-5016 • email: board@co.cochise.az.us
http://www.cochisecounty.com or http://www.co.cochise.az.us

APPROVED AND ADOPTED in Formal Session this 15th day of January, 2008

Richard Searle, Chairman
Cochise County Board of Supervisors

ATTEST:

Katie A. Howard,
Clerk of the Board

APPROVED AS TO FORM:

Britt Hanson,
Deputy County Attorney

FEE # 080101719
OFFICIAL RECORDS
COCHISE COUNTY
DATE HOUR
01/22/08 4
REQUEST OF
COCHISE COUNTY BOARD OF SUPV
CHRISTINE RHODES-RECORDER
FEE : PAGES : 5

080101719

Board of Supervisors

ORDINANCE NO. 36-08

AN ORDINANCE OF THE BOARD OF SUPERVISORS OF COCHISE COUNTY, ARIZONA, WHICH REGULATES CONTACT BETWEEN WILDLIFE AND HUMANS WITHIN COCHISE COUNTY IN AN EFFORT TO PROTECT THE WELFARE AND SAFETY OF THE PUBLIC

WHEREAS, by Arizona Revised Statutes Title 17, the Arizona Game and Fish Commission is established and tasked with the responsibility to manage wildlife in Arizona; and

WHEREAS, the Board of Supervisors, pursuant to A.R.S. § 11-251.31, may make and enforce all local, police and sanitary regulations not in conflict with general law; and the issue of humans feeding wildlife and leaving human food and garbage available for wildlife has created and continues to create public safety concerns; and

WHEREAS, the frequency of wildlife/human public safety conflicts within Cochise County are escalating and pose a potential threat to the welfare and safety of the public; and

WHEREAS, the attraction of javelina, a primary prey animal for mountain lions, tends to attract mountain lions into the communities where these animals are being fed, and mountain lions are predators that have harmed humans in our state in the past by predatory attacks; and

WHEREAS, the Board of Supervisors has determined that the intentional, careless, negligent or reckless placing, storing or discarding of garbage, refuse, human and animal food or edibles contributes to the frequency of potentially dangerous contacts between humans and wildlife such as bears, coyotes, and mountain lions,

NOW, THEREFORE, BE IT ORDAINED that the Cochise County Board of Supervisors supports the enforcement of regulations for feeding certain wildlife, as follows:

Section 1. Wildlife feeding regulations

Subsections:

1.01 Feeding or attracting bears, javelina, coyotes and mountain lions prohibited
1.02 Definitions
1.03 Applicability
1.04 Exceptions
1.05 Enforcement

080101719

1.06 Separate offenses
1.07 Penalty

1.01 Feeding or attracting bears, javelina, coyotes and mountain lions prohibited.

It is unlawful for any person to intentionally feed bears, javelina, coyotes or mountain lions, or to attract them by intentionally, negligently or recklessly placing water, garbage, refuse, human or animal food, or edibles in a place that is physically accessible to such wildlife.

1.02 Definitions.

A. "Feeding" is defined as the intentional provision of water, animal or human food, animal carcasses, or edibles to wildlife.
B. "Attracting" is defined as placing water, animal or human food, edibles, animal parts or carcasses, garbage, or refuse in an area where a reasonable person would be aware of the potential presence of wildlife.

1.03 Applicability.

This ordinance applies within all unincorporated areas of Cochise County.

1.04 Exceptions.

This ordinance does not apply to:

A. Public employees or their agents acting within the scope of their authority for public safety or wildlife management purposes.
B. Feeding or attracting wildlife as permitted by Arizona law and not prohibited by any Arizona Game and Fish Commission Rule or Order.
C. Food or edibles that are being transported, consumed, or prepared for human consumption.
D. Garbage or refuse that is being transported to an approved landfill or disposal facility.
E. Water, food, edibles, garbage, or refuse located in a residence, sealed vehicle or storage building, or in a camping storage unit that is constructed of solid, non-pliable material.
F. Food, edibles, garbage or refuse suspended at least ten feet above the ground and four feet horizontally from a post, tree trunk or other object on which a bear can climb.
G. Food, edibles, garbage or refuse stored in a covered and locked container made of sturdy, non-pliable material provided, however, that refrigerators or freezers that are placed outside, even if locked, are not exempt under this ordinance.
H. Municipal and commercial zoos or Arizona Game and Fish Department licensed wildlife rehabilitation providers.
I. Provision of feed exclusively for livestock, horses, swine, poultry, or fowl.
J. Feeders placed to attract birds or other wildlife that do not pose a public safety issue, nor attract bears, javelina or coyotes.

1.05 Enforcement.

An animal control officer or any state certified peace officer may issue a citation for the violation of this ordinance subject to the following provisions:

First offense: The violator is provided information about the ordinance and the public safety hazards associated with feeding or attracting wildlife and given a verbal warning.

Second offense: The violator is issued a citation for violating this section of the Cochise County Ordinance.

1.06 Separate offenses.

Each violation (after a first offense) pursuant to this section shall constitute a separate offense and each day a violation remains unabated may constitute a separate offense.

1.07 Penalty.

Pursuant to A.R.S. § 11-251.05A.2, a violation of this section constitutes a Class 1 misdemeanor and is punishable by a fine of not more than $2,500, 6 months in jail, 3 years of probation, or any combination thereof.

PASSED AND ADOPTED by the Cochise County Board of Supervisors this 15th day of January, 2008. Effective date of the Ordinance shall be thirty (30) days, hereafter.

Richard Searle, Chairman
Cochise County Board of Supervisors

ATTEST:

Katie A. Howard,
Clerk of the Board

APPROVED AS TO FORM:

Britt W. Hanson,
Chief Civil Deputy

2010-07762
Page 1 of 2
Requested By: BOARD OF SUPERVISORS
Navajo County Recorder - Laurette Justman
05-13-2010 09:14 AM Recording Fee $0.00

N/C

Ordinance No. 09-10

An Ordinance of the Navajo County Board of Supervisors, Amending the Navajo County Animal Control Ordinance, Ordinance No. 02-06, by Adding a New Article 4 Concerning Remedial Actions to Avoid Contact between Humans and Bears, Coyotes or Javelinas

WHEREAS, the Navajo County Animal Control Ordinance, Ordinance No. 02-06, comprehensively regulates the keeping of dogs and other animals in the unincorporated areas of Navajo County; and

WHEREAS, in the interest of public safety, and specifically in the interest of minimizing contact between humans and potentially dangerous species of wildlife, numerous jurisdictions across the United States have adopted regulations prohibiting conduct that tends to attract dangerous species in inhabited areas; and

WHEREAS, the Arizona Game and Fish Department has encouraged local jurisdictions to adopt similar regulations to minimize potentially dangerous contacts between humans and wildlife; and

WHEREAS, the Board of Supervisors has been informed of potentially dangerous contacts occurring in Navajo County as the result of carelessness in regard to the placement or storage of trash, food and other items that tend to attract dangerous species,

NOW, THEREFORE, BE IT ORDAINED by the Board of Supervisors that the Animal Control Ordinance is hereby amended by the insertion of the following new Article 4, with the current Article 4 (Penalties and Enforcement) being renumbered as Article 5:

Article 4 – Remedial Actions to Avoid Contact between Humans and Certain Dangerous Species

It shall be unlawful for any person to fail to take remedial action to avoid contact between humans and bears, coyotes or javelinas after having been notified by the Code Enforcement Agent, an officer of the Arizona Game and Fish Department or any peace officer that bears, coyotes or javelinas are in the area and that remedial action should be taken. Such notice may be oral or written. Remedial action shall take the form prescribed by the official giving such notice and may include without limitation actions to secure or remove outdoor trash, cooking grills, pet food, bird feeders and any other food source or attractant likely to attract

bears, coyotes or javelinas. In addition, it shall be unlawful for any person, after an initial contact or conflict with a bear, coyote or javelina on property owned or occupied by the person (including a sighting of a bear, coyote or javelina on or in close proximity to the property) to fail to take prompt remedial action to secure or remove outdoor trash, cooking grills, pet food, bird feeders and any other food source or attractant likely to attract bears, coyotes or javelinas. The obligation to take remedial action under this Article shall continue for the period prescribed by the official giving notice or for a period of not less than 30 days after the initial contact or conflict, as the case may be.

PASSED AND ADOPTED by the Navajo County Board of Supervisors on May 11, 2010.

Navajo County Board of Supervisors

By _____
Jesse Thompson
Chairman

ATTEST:

Melissa W. Buckley
Melissa W. Buckley, Clerk of the Board

Prescott (w/i yavapai)

5-3-16 OUTDOOR FEEDING AND PROTECTION OF WILDLIFE:

(A) Definitions. In this section unless the context otherwise requires:

1. "Feeding" or "to feed" means placing edible material in a location where it can be consumed by wildlife.

2. "Attracting" or "to attract" means placing edible material in a location where a reasonable person would be aware of the potential presence of wildlife.

3. "Edible material" means any human or animal food, food by-product, animal carcasses, salt, organic material, refuse, garbage or water.

4. "Wildlife" means bears, javelina, deer, coyotes or/and mountain lions.

5. "Public employees" means any federal, state, county or City employees.

(B) Feeding or Attracting Wildlife Prohibited. It is unlawful for any person to intentionally, knowingly or recklessly feed wildlife or to attract wildlife.

(C) Applicability. This section applies to all areas within the Prescott City limits.

(D) Exceptions. This section does not apply to:

1. Public employees, or their authorized agents, acting pursuant to A.R.S. Title 17 or Game and Fish Commission rule or order or acting within the scope of their authority for public safety or wildlife management purposes.

2. Edible material located in a residence, closed vehicle, fully enclosed storage structure, or in a closed trash container.

3. A person feeding his/her own horses or domestic animals.

4. Feeders placed to attract birds, squirrels or other wild animals that do not pose a public safety threat.

5. Water features such as fountains, ponds, birdbaths or similar structures where the primary purpose is decorative or ornamental.

6. Growing plants or parts of growing plants, including gardens and fruit bearing trees or plants and the parts of those plants that may have fallen to the ground from those plants.

7. Compost piles that are fully contained and made inaccessible to wildlife.

8. Hand feeding of ducks or water fowl on lakes or ponds.

(E) Limitations to Exceptions. The exceptions do not apply to any person who knows or has reason to know that an activity is attracting wildlife other than birds or tree squirrels. To avoid a violation, a person shall modify placement of any edible material, immediately cease the activity, or take such actions as the situation may require.

(F) Enforcement. An Arizona Game and Fish officer, animal control officer, City Code Enforcement Officer, or any AZPOST certified peace officer may issue a written warning or citation for the violation of this section.

(G) Separate Offenses. Each violation pursuant to this section shall constitute a separate offense and each day a violation remains unabated may constitute a separate offense.

(H) Penalties.

1. Upon a first violation of this section, an officer shall issue a written warning and provide the person with wildlife educational materials.

2. If there is a violation of this section within sixty (60) days from the date a warning was issued, the new violation is a petty offense punishable by a fine not to exceed one hundred fifty dollars ($150.00), plus any other penalties, assessments or surcharges authorized by law.

3. If there is a violation of this section and the person has previously been convicted within ninety (90) days of violating this section it is a petty offense punishable by a fine not less than one hundred fifty dollars ($150.00) and not more than three hundred dollars ($300.00), plus any other penalties, assessments or surcharges authorized by law.

4. If there is a violation of this section and the person has previously been convicted two (2) or more times within one hundred and eighty (180) days of violating this section, it is a class three misdemeanor, plus any other penalties, assessments or surcharges authorized by law. (Ord. 4969, 5-3-2016)

5.05.140 Wild animals.

(A) Any property owner who fails to take remedial action to avoid contact between humans and bears, coyotes, javelinas, or other wild animals after having been notified in writing by animal control or any peace officer is guilty of a civil violation. Remedial action may include, without limitation, actions to secure or remove outdoor trash and any other food source or attractant likely to attract bears, coyotes, javelinas, or other wild animals.

(B) Any property owner who knowingly or purposely leaves garbage, refuse, debris, or any other attractant outside in order to attract bears, coyotes, javelinas, or other wild animals shall be guilty of a civil violation.

(C) Exhibitions or parades of wild animals may be conducted only upon securing a permit from the city unless the exhibition or parade is conducted by another government agency or adequately covered under another city permit. (Ord. No. 2004-20, §§ 1, 2, 9-21-04; Ord. No. 2010-13, § 1, 8-17-10. 1976 Code § 6-1-14)

6-01-001-0023 OUTDOOR FEEDING AND PROTECTION OF WILDLIFE

A. Definitions. In this section unless the context otherwise requires:

1. "Feeding" or "to feed" means placing edible material in a location where it can be consumed by wildlife.

2. "Attracting" or "to attract" means placing edible material in a location likely to entice wildlife to the source of the edible material.

3. "Edible material" means any human or animal food, food by-product, salt organic material, refuse, garbage or water.

4. "Wildlife" means all wild mammals and/or wild birds.

5. "Public employees" means any federal, State, County or City employees.

B. Feeding or Attracting Wildlife Prohibited. It is unlawful for any person to intentionally, knowingly or recklessly feed wildlife or to attract wildlife.

C. Applicability. This section applies to all areas within the Flagstaff City limits.

D. Exceptions. This section does not apply to:

1. Public employees, or their authorized agents, acting pursuant to A.R.S. Title 17 or Game and Fish Commission rule or order or acting within the scope of their authority for public safety or wildlife management purposes.

2. Edible material located in a residence, closed vehicle, fully enclosed storage structure, or in a closed trash container.

3. A person feeding their own horses or domestic animals.

4. Seeds, nectar, and other material for birds or squirrels placed specifically for attracting wild birds and/or tree squirrels in a closed top container placed at least four (4) feet above the ground.

5. Growing plants or parts of growing plants, including gardens and fruit bearing trees or plants and the parts of those plants that may have fallen to the ground from those plants.

6. Compost piles that are fully contained and made inaccessible to wildlife.

7. Hand feeding of ducks or water fowl on lakes or ponds.

E. Limitations to Exceptions. The exceptions do not apply to any person who knows or has reason to know that an activity is attracting wildlife other than birds or tree squirrels. To avoid a violation, a person shall modify placement of any edible material, immediately cease the activity, or take such actions as the situation may require.

F. Enforcement. An Arizona Game and Fish officer, animal control officer or any State certified peace officer may issue a written warning or citation for the violation of this section.

G. Separate Offenses. Each violation pursuant to this section shall constitute a separate offense and each day a violation remains unabated may constitute a separate offense.

H. Penalties.

1. Upon a first violation of this section, an officer shall issue a written warning and provide the person with wildlife educational materials.

2. If there is a violation of this section within sixty (60) days from the date a warning was issued, the new violation is a petty offense punishable by a fine not to exceed one hundred fifty dollars ($150.00), plus any other penalties, assessments or surcharges authorized by law.

3. If there is a violation of this section and the person has previously been convicted within ninety (90) days of violating this section it is a petty offense punishable by a fine not less than one hundred fifty dollars ($150.00) and not more than three hundred dollars ($300.00), plus any other penalties, assessments or surcharges authorized by law.

4. If there is a violation of this section and the person has previously been convicted two (2) or more times within one hundred and eighty (180) days of violating this section, it is a class three misdemeanor, plus any other penalties, assessments or surcharges authorized by law. (Ord. 2013-20, Enacted, 09/17/2013)

To feed or not to feed: a contentious issue in wildlife tourism

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ABSTRACT

There is a deep need within humans to be in contact with animals and feeding has arisen as a means of achieving this as well as fostering a sense of nurture and even assistance to wild animals. In tourism situations feeding is frequently used in order to enhance visitor satisfaction through delivering a good sighting and close contact as well as through improved opportunities to photograph wildlife. Wildlife feeding activities comprise one or a combination of being inadvertent and accidental, a result of deliberate habitat modification to attract wildlife, unstructured, namely the intentional provisioning of food for wildlife without any form of management or structured where wildlife are deliberately fed via formal supervised arrangement. All of these situations have the potential to have both positive and negative impacts on wildlife. Recognised advantages of intentional feeding can be divided into two categories. The first relates to visitor experience and tourism product while the second involves animal welfare issues. Potential and realised problems associated with the feeding of wildlife include habituation and attraction, disruption of normal activities, increased aggregation of animals at feeding sites and nutritional problems. Management strategies aim to control access, visitor numbers, the nature and quality of provisioned food and the educational value of the viewing experience. Management styles cater for different circumstances and include wild bird feeding operations, wildlife restaurants, structured fish feeding and highly managed dolphin feeding. All of these involve a specific feeding area, controls over the feeding activity and educational programmes. It seems that on, a global scale, birds appear the most suitable candidates for structured feeding operations. Caution must be exercised in developing a feeding situation for tourism purposes and be subject to review in the light of new information on the benefits or otherwise of the feeding situation. Feeding operations should also be based upon the fostering of respect and appreciation of natural values and not entertainment.

Key words: Wildlife tourism, food provisioning, advantages of feeding, impacts, management, interpretation

Introduction

Wildlife tourism is an important economic activity worldwide with visitation to sites of wildlife interest continuing to rise (Braithwaite 2001; Higginbottom 2004; Tisdell and Wilson 2004; Newsome *et al.* 2005). For example, it is estimated that there are 1000-1500 wildlife tourism enterprises in Australia with the associated wildlife tourism industry currently thought to be worth $1.5 to 3 billion (Hundloe and Hamilton 1997; Tourism Tasmania and Parks and Wildlife Services Tasmania 2005) As discussed by Newsome *et al.* (2005) there is frequently a deep need within humans to be in contact with animals which is reflected in the huge industry associated with various pets, the popularity of zoological collections, and a plethora of books, magazines and television documentaries concerned with wildlife. In addition, there is the ever-increasing interest in viewing animals in the wild. Because of the desire to be in close contact with animals, feeding has arisen as a means of achieving this as well as fostering a sense of nurture and even assistance to wild animals. Feeding can also be viewed as stimulating awareness and knowledge of wildlife particularly in the case of bringing children into contact with responsive animals. In some cases feeding has a long history and is well established and promoted in places like the USA and UK where the public engage in home backyard feeding as well as attending tourism centered wildlife feeding situations. This is particularly evident in the case of bird feeding where significant conservation groups such as the Royal Society for the Protection of Birds (RSPB) in the UK actively promote food provisioning (Fig 1). The whole concept of helping wildlife and making a contribution to restoring depleted populations has been extended to other species for example, also in the UK, advice on feeding mammals is provided by various Wildlife Trusts and English Nature.

Feeding can also be used in specific tourism contexts in order to enhance visitor satisfaction through delivering a good sighting and close contact as well as through improved opportunities to photograph wildlife (e. g. Fig. 2). The feeding of wildlife therefore can be seen to occupy a spectrum which at one end involves the casual feeding of wildlife in non-tourism situations through to highly structured situations where otherwise difficult

Pp 255 - 270 in *Too close for comfort: contentious issues in human-wildlife encounters,* edited by Daniel Lunney, Adam Munn and Will Meikle. 2008. Royal Zoological Society of New South Wales, Mosman, NSW, Australia.

Figure 1. Shop on the Royal Society for the Protection of Birds Reserve Minsmere, England selling a wide range of feeding apparatus and various wild bird foods and seed mixes. Minsmere hosts special events for children that include making bird feeders and bird cake. Slimbridge, in southern England, is another location that sells bird food. Wild bird feeds take place at the Peng Observatory at Slimbridge from January to March. There are special evening floodlit sessions with a commentary educating the public about the feeding of birds during winter. Photo. D. Newsome.

to see, and/or wildlife that occurs in specific locations, are fed as part of a tourism attraction. Because wildlife tourism is a means of learning about wildlife and the way that most people come into contact with exotic, rare and charismatic species this chapter seeks to explore the spectrum introduced above. It is thus necessary to take on a global view, so that the wildlife-feeding situation, particularly from a tourism perspective, can be fully appreciated.

Figure 2. Bird feeding devices such 'nut feeders' (directly in front of the viewer) provide enhanced viewing opportunities (value added tourism product) at a bird hide at Rutland Water, UK. Photo. D. Newsome.

One of the complexities that lies with understanding the issues associated with food-provisioned wildlife is in the context of inadvertent, unstructured and structured feeding activities. Inadvertent feeding is when wildlife is fed accidentally as compared with accepted feeding practices that can be divided into (a) un-supervised or unstructured food provisioning and (b) structured feeding operations where there is a significant regulated and organised activity. There are recognized advantages (visitor satisfaction; promotion of goodwill towards wildlife) and disadvantages (feeding wildlife the wrong foodstuffs; abnormal concentrations of animals at feeding sites; pollution; risk of humans being bitten) associated with all these situations and this chapter explores each condition accordingly.

Because of the perceived disadvantages in feeding wild animals (e.g. Green and Higginbottom 2001; Higginbottom 2004; Newsome *et al.* 2005) sitting alongside variable human interests, expectations and attitudes towards wildlife, there are the different and conflicting perspectives as to whether feeding is desirable or not and in many cases debate as to how wildlife feeding should be managed. Moreover, problems of inappropriate feeding, risks to wildlife and public safety are issues that many local authorities, councils and land management agencies have to deal with (e.g. Fig. 3).

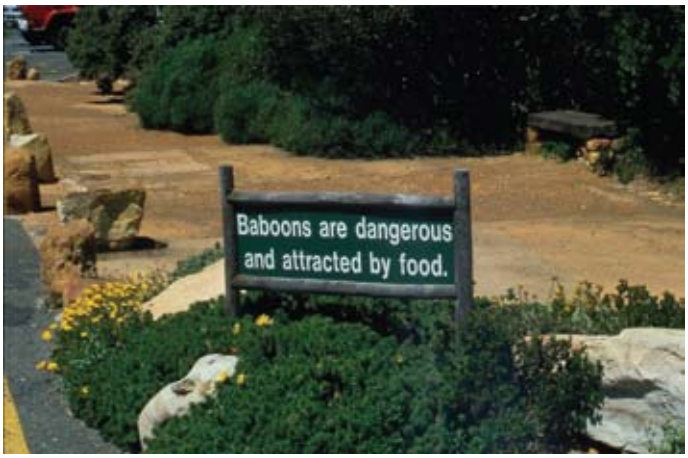

Figure 3. Warning sign Cape Peninsula National Park, South Africa. There is a blur between wildlife tourism and general recreation. Incidental feeding can evolve into a regular pattern of deliberate feeding as animals are attracted to picnic sites and day use areas. The feeding of primates is particularly problematical due to close approach of the animals and individual behaviours that lead to animals 'controlling' the feeding situation. Photo. D. Newsome.

Green groups and animal welfare agencies have expressed concerns relating to the manipulation of wildlife in some feeding situations. Differing stakeholder opinions further complicates the situation. While many people seek close interaction and wish to gain photographs and unique experiences there are others who demand more authentic and sustainable wildlife tourism experiences. This chapter therefore explores the arguments for and against feeding in the context of various management situations. The final part of this chapter attempts to formulate some principles and guidelines relating to the issue of feeding of wildlife in tourism situations.

The spectrum of wildlife feeding activity

The feeding of wildlife can be classed as either the intentional or accidental supply of non-natural foods to wild animals. Intentional feeding is where tourists provide food informally for wildlife (e.g. feeding of stingrays, Australia and the Caribbean) or under supervised conditions

(e.g. feeding of dolphins, Australia). Accidental feeding involves the wildlife acquiring food from disposal areas (e.g. dingoes *Canis lupus dingo* Fraser Island, Australia), discarded food wastes (e.g. bears in North America) or by stealing directly from the tourists themselves (monkeys in Africa and Asia, see Fig. 4) (Newsome *et al.* 2005). The spectrum of wildlife feeding activity, which includes both accidental and intentional feeding, can be categorised as inadvertent, via habitat modification, unstructured or structured. All of these have the potential to have both positive and negative impacts on wildlife.

Figure 4. Do not feed the monkey signage at Bukit Timah Nature Reserve, Singapore. Despite the signage and risk of penalties visitors to the reserve have been observed checking for management presence and then secretly giving food to the monkeys. Photo. D. Newsome.

Inadvertent Feeding

Inadvertent feeding is where the provisioning of food is predominantly accidental. This form of feeding is where the wildlife scavenges human foods from campsites and refuse disposal sites. Places where inadvertent feeding is known to take place include campgrounds, fishing sites, picnic and day use areas, as well as at tourist accommodation sites. As animals become habituated to human presence and learn to obtain discarded food items they may also steal food left on unattended picnic tables, or forage through food and storage containers (Howard and Jones 2004; Newsome *et al.* 2005). Such inadvertent feeding by tourists can impact on the normal feeding behaviour of animals. For example, grizzly bears *Ursus arctos horribilis* in Yellowstone National Park, USA were affected when park refuse sites were closed in the 1970s. Upon the closure of refuse sites a significant decrease in the reproductive rate of bears, litter size and body size was detected (Knight and Temple 1995; Roe *et al.* 1997). A further outcome from inadvertent feeding is animals becoming unnaturally aggressive towards humans. For example, in 2001 on Fraser Island, Australia a 9 year old child was mauled to death by two dingoes. This resulted in the cull of 31 dingoes on the island and management focusing on changing tourist behaviour in relation to feeding dingoes at camping areas and the storage and disposal of human foods (Burns and Howard 2003; Howard and Jones 2004).

Feeding through habitat modification

This is the common practice of attracting animals through the planting of lawns, trees and shrubs (Green and Higginbottom 2000; Howard and Jones 2004). The supply of food and water are some of the most powerful attractants for wildlife. Fruiting trees, nectar rich flowers and water holes can thus be used to manipulate the distribution, abundance and proximity of wildlife (Gill 2002). For example, lawns can be planted with the intention of attracting herbivores such as kangaroos in Australia (Green and Higginbottom 2000).

In Africa watering points are commonly used to facilitate wildlife viewing (Green and Higginbottom 2000; Newsome *et al.* 2002). For example in Kenya at Tsavo Park an artificial waterhole was built near Kilguni Lodge to allow hotel guests to watch the animals come to drink. However the constant presence of wildlife resulted in degradation of the area surrounding the waterhole leading to loss of vegetation and the creation of bare eroded areas. The provision of waterholes thus has the potential to bring about a concentration of wildlife that under normal conditions would tend to follow seasonal rains. Such a lack of migratory behaviour can result in damaged and altered habitats around human created waterholes (Ayeni 1977; Goodwin *et al.* 1998; Frost and Shanka, Undated).

While similar to and sometimes overlapping with structured feeding situations, where the nature and supply of food is controlled by management, Newsome *et al.* (2005) observe that the objective of habitat modification is to commonly facilitate viewing and photography of wildlife rather than satisfying a need for the tourist to feed the wildlife. The privately owned Kingfisher Park, Julatten, Australia consisting of rainforest and accommodation for birdwatchers is an example of where both approaches are employed. This park offers high quality interpretative guiding and approximately 150 species can be found in and around the park. To achieve a high diversity of species in good viewing numbers the park uses both habitat modification and a structured feeding programme. The dual approach involves the provision of bird attracting trees and shrubs such as *Grevillea sp*. and the provision of seven water dishes, two nectar feeders, a seed feeder and a fruit feeder. This double strategy attracts many species of birds as part of their natural foraging behaviour while allowing clear viewing and photographing opportunities for tourists (Newsome *et al.* 2005).

Unstructured Feeding

Unstructured feeding is intentional provisioning of food for wildlife without any form of management or informed supervision. In this case little to no education or interpretation takes place. Furthermore, there is often little control over what is fed to wildlife (Newsome *et al.* 2004). This type of feeding can take place in public places (e.g. Fig 5), in the backyards and gardens of private individuals and can also include evolving attractions (this latter point involves a spectrum of feeding activity that may or may not become a regular feeding situation – see later). Further examples of unstructured feeding situations occurring in public places include bird feeding at ponds and lakes such

as at Lake Monger, Western Australia (Fig. 6) and feeding fish to the pelicans outside a fish and chip restaurant on the Gold Coast, Australia (Fig. 7). Backyard feeding is also classified as unstructured feeding. Attracting wildlife to suburban back yards is extremely common throughout the Western world (O'Leary and Jones 2006). Studies in Australia have found 40-60% of households undertake some form of wildlife feeding (Jones and Howard 2001). In North America it is estimated that 63-80 million people feed birds during winter (Wilson 2001). In the UK wild bird feeding is supported by conservation organizations such as the RSPB, which provides advice on what to feed to birds (see Fig. 1).

Figure 5. Unstructured and casual feeding of birds in Sydney Botanic Gardens. Sacred Ibis *Threskiornis aethiopicus* (prominent in this photograph), various species of pigeon and flocks of up to 30 Sulphur-crested Cockatoo *Cacatua galerita* are attracted to and regularly fed by visitors to the gardens. Photo. D. Newsome.

Figure 6. Unstructured feeding of birds taking place at lake Monger, Western Australia. Over time the practice of feeding swans and ducks became very popular resulting in the site being targeted as a visitor attraction by bus tour companies. Risks to the health of wild birds due to the use of bread, the attraction of nuisance species such as Silver Gulls (*Larus novaehollandiae*), pushy behaviour of the swans and the risk of wild birds being killed on nearby roads has resulted in food provisioning being prohibited at lake Monger. Photo. D. Newsome.

Figure 7. The unstructured feeding of pelicans outside a popular fish and chip restaurant on the Gold Coast, Queensland. Here the daily feeding can attract over 20 pelicans and crowds of up to 50 people. Photo. K Rodger

In some cases unstructured feeding has the potential to develop into more structured form of feeding. An example of this is the feeding of dolphins at Monkey Mia, Western Australia. In the 1960s this unstructured feeding attraction commenced as local fisherman started to feed bottlenose dolphins *Tursiops truncatus*. This expanded throughout the 1970s to include tourists feeding the dolphins (Mann and Kremps 2003). Today Monkey Mia is a multi-million dollar tourism industry that has developed on the basis of the viewing and feeding of the dolphins (Fig. 8) (CALM 1993). In the absence of management controls unstructured feeding can result in negative impacts on the wildlife. The feeding of black *Dasyatis thetidis* and smooth *Dasyatis brevicaudata* stingrays at Hamelin Bay, Australia (Fig. 9) is an example of an evolving attraction. Here unmanaged/uncontrolled feeding has resulted in behavioural impacts with the rays being attracted to humans resulting in aggression and hierarchy towards one another and the possible risk of people being injured by stingray barbs. A major issue for situations such as this is the lack of management supervision and a dearth of information provided to the tourists at the site (Lewis and Newsome 2003; Newsome *et al.* 2004). Some evolving attractions may terminate due to awareness of problems developing or upon the instigation of management controls (e.g. see Fig. 6) or in other cases continue to develop to be subsequently managed as a major tourism attraction such as at Monkey Mia in Western Australia (see Fig. 8).

Structured Feeding

Structured feeding is where wildlife are deliberately fed via formal supervised arrangement. This includes feeding by tourists, the provision of food by tour operators to ensure predictable viewing of wildlife and the feeding by managing agencies (Green and Higginbottom 2001). Structured feeding can take place in a variety of situations involving semi captive to free ranging wildlife on private property through to government managed land or water. An example of structured feeding on private property is the provisioning of Tasmanian Devils *Sarcophilus harrisii* in Australia. Wildlife tours operate to view Tasmanian

Figure 8. The structured feeding of dolphins at Monkey Mia Dolphin Interaction Area, Western Australia. Feeding takes place 3 times a day anywhere between 8am and 1pm attracting crowds of up to 700 people. Staff stand in the water with buckets containing fish while educating visitors on the dolphins and the history of Monkey Mia. Following this several tourists are chosen from the crowd to come into the water and feed a fish to the dolphins. Photo, K. Rodger.

Figure 9. Unstructured feeding of stingrays at Hamelin Bay, Western Australia. Some of the issues identified were risk of rays being damaged by boats, overfeeding, feeding the wrong food, ignorant behaviour of visitors, skin lesions on rays as a result of excessive touching by visitors, damage to rays from fishing hooks and water pollution (see Lewis and Newsome, 2003 and Newsome *et al.* 2004). Photo. D. Newsome.

devils feeding on carcasses placed in a natural setting where tourists view the feeding activity from a hide (Nick Mooney, pers. comm.). The tours operate no more than five days a fortnight and no more than three days in a row to avoid devils becoming dependent on the food.

Structured feeding is also a component of conservation management where management decides that a certain species will benefit from food supplementation because it contributes to the animals' survival while allowing for close contact with wildlife. Furthermore, it provides an opportunity to foster appropriate behaviour towards wildlife (Newsome *et al.* 2005). This is because education and interpretation are normally a part of the tourism-wildlife feeding interaction. An example is the feeding of birds at the Slimbridge Wildfowl and Wetlands Centre in England. Slimbridge contains the largest captive collection of wildfowl in the world and the public are encouraged to feed the birds which are on display (Fig 10). In addition the centre is adjacent to a nature reserve where over 250 species of wild birds have been identified. Formulated mixes can be purchased and tourists are allowed to feed the captive birds throughout the year. During winter wild birds are also fed at scheduled times when they are under stress due to the cold conditions. However, this aspect of feeding at Slimbridge is supervised with visitors being educated not only on what to feed but also why the wild birds are being fed (Newsome *et al.* 2005).

Recognised advantages of feeding wildlife

Orams (2002) noted that the feeding of wildlife can provide significant social, economic and in some cases environmental benefits, although not all apply at the same time these potential benefits serve to illustrate a range of advantages depending on the situation and the species involved. Recognised advantages of intentional feeding can be divided into two categories. The first relates to visitor experience and tourism product while the second involves animal welfare issues. In many cases the intentional feeding of wildlife for tourism is based predominantly on ensuring a good tourism experience. The viewing of wildlife requires a predictable occurrence of wildlife species within a small spatial area (Duffus and Dearden 1990). To achieve reliable viewing of wildlife provisioning is therefore undertaken to attract them to a particular site resulting in value added to the tourism product (Orams 2002).

For tourists the feeding of wildlife allows for the opportunity to have a close up personal experience and in doing so people are more able to connect with wildlife (Fig. 11). According to Orams (2002) in today's world there is a decreasing number of opportunities to interact with wildlife. A key feature of the wildlife tourism experience therefore is close proximity to the animals resulting in tourists feeling they can commune with nature (see Muloin 1998; Schnazel and McIntosh 2000; Orams 2002). Feeding of wildlife ensures this close interaction will take place resulting in enhanced viewing and photographic opportunities and increased visitor satisfaction. An example of how this works is the Jumping Crocs Cruise on the Adelaide River in the Northern Territory. Tour guides suspend meat from lines above the water to attract crocodiles to jump out and seize the bait providing opportunities for photos (Fig. 12) (Ryan 1998). The jumping for food is a natural part of crocodiles foraging behaviour while allowing for greater viewing and photography. However, studies conducted by Chirgwin and Harvey (1999) indicated that these interactive feeding tours may have some impact on the saltwater crocodiles behaviour. There are particular problems associated with feeding aggressive, carnivorous species. For example in the case of feeding Komodo dragons *Varanus komodoensis* in Indonesia the use of goat carcasses resulted in abnormal concentrations of dragons at the provisioning site in addition to making potentially dangerous animals less wary of humans. This is a predicted situation with the feeding of crocodiles in the Northern Territory of Australia. Currently the Jumping Crocs cruises are not subject to any permits or regulations

but operators seem to have developed their own code of ethics. Furthermore, the Parks and Wildlife Commission have no plans to regulate or introduce a permit system. Yet, the potential impact of crocodile feeding tours on crocodile behaviour, such as attraction to recreational boats, is an important issue for not only the conservation of saltwater crocodiles *Crocodylus porosus* but also the sustainability of the tourism activity.

Figure 10. The Slimbridge Wetlands Centre, England contains the world's largest captive collection of wildfowl including the endangered Hawaiian Goose. Formulated mixes can be purchased and visitors feed many species of wildfowl that roam the ground freely or are otherwise on display in open pens. Photo. by D. Newsome.

Figure 11. This photograph highlights the enjoyment of feeding captive emus *Dromaius novaehollandiae*. Structured feeding in a captive situation allows for visitors to interact with animals which can often be difficult to view in the wild. Feeding wildlife can bring great enjoyment as well as providing the opportunity for education and interpretation. Photograph by K. Rodger.

Figure 12. The structured feeding of crocodiles takes place on the Adelaide River in the Northern Territory, Australia to enhance the tourism product. Meat is delivered from the side of the boat to encourage crocodiles to jump. This allows for not only greater photographic opportunities but also the excitement of seeing the crocodiles jump. Photo. K. Rodger.

Feeding is attractive to tour operators because it adds to the value of the tourism product by increasing the chances of sighting the wildlife on which they base their businesses. This is particularly the case in Australia where many of the native species are nocturnal and crepuscular. Provisioning of food can create opportunities for tourists to interact with these animals (Hodgson *et al.* 2004). For example, the structured feeding of semi-captive rare and charismatic fauna (which are often difficult to view) at Barna Mia in Western Australia. Here the wildlife are surrounded by electrified fence to keep feral predators, such as foxes *Vulpes vulpes*, out. Guided walks are offered which include the feeding of the captive wildlife to attract them to the visitor groups. Visitors can also take part in the feeding process. Visitors have reported a great sense of satisfaction with this experience (Hughes *et al.* 2005). Without reliable wildlife viewing the economic viability of tour operators businesses can be compromised (Orams 2002).

The second recognised advantage of wildlife feeding relates to animal welfare issues and in particular is thought to reduce the negative ecological effects from habitat loss. These may be powerful reasons for people wanting to feed wildlife in tourism situations or otherwise. Howard and Jones (2000) noted the most common reason for the feeding of birds by residents in Southeast Queensland was to compensate for the loss or destruction of wildlife and their habitats. In the Northern Hemisphere the feeding of wildlife is promoted as being beneficial to the animals, as raising the importance of conservation (especially in urban areas) and as a means of increasing community interest in wildlife (Cannon 1999, cited in O'Leary and Jones 2006). The most popular of all wildlife for people to feed is birds (Orams 2002). As stated previously organisations including the British Trust for Ornithology (BTO) and Royal Society for the Protection of Birds (RSPB) in the UK actively encourage the feeding of birds as a means

of enriching the urban environment and increasing the survival of birds during severe winter conditions.

Where species have been hunted and persecuted or where habitats have been significantly modified by humans the provisioning of food may aid the recovery of threatened species populations (Orams 2002). The work by Wilbur *et al.* (1974) demonstrated the benefits of provisioning in enhancing populations of endangered species including the California condor *Gymnogyps californianus*. Supplementary food provisioning has resulted in the increased nestling survival of northern goshawks *Accipiter gentilis* in North America. Ward and Kennedy (1996) provided northern goshawks with food from hatching until dispersal. They found that food provisioning influenced the behaviour and/or physiology of northern goshawks. In many circumstances, the increased survival rate of juveniles was attributed to the altered behaviour of provisioned adult females. This was due to the increased time adult females spent in nest stands allowing a greater time in detecting chick predators (Ward and Kennedy 1996).

Provisioning of food can also assist wildlife during periods of natural food shortage such as drought, after bush fires in fire prone environments or during freezing conditions in the Northern Hemisphere. An example of this is the winter feeding of White-tailed Deer (*Odocileus virginianus*) in Ontario, Canada. In the 1970s deer numbers were diminished and the winter habitat was severely degraded due to farming and land clearing. The lack of accessible food resulted in the starvation and death of deer. In response to this local residents fed the animals and this resulted in feeding becoming commonplace even with the support of the government. This allowed the deer to survive severe winters which in turn resulted in an increase in the population (Ministry of Natural Resources Ontario Undated).

The overall advantage to be gained from the structured feeding of wildlife is increased education, awareness, and the promotion of goodwill towards wildlife. Feeding of wildlife can allow for information to be delivered to tourists resulting in greater understanding and knowledge of species. Education is an important component of wildlife management (Orams 1996). As Newsome *et al.* (2005) noted increased knowledge could result in increased conservation supporting behaviour.

Problems associated with feeding wildlife

Potential and realised problems associated with the feeding of wildlife are summarized in Table 1. Orams (2002), however, observed that there was a general lack of scientific evidence in support of such claims. Bearing that in mind the scientific evidence continues to grow (e.g. see Lewis and Newsome 2003; Newsome *et al.* 2004; Newsome *et al.* 2005; Milazzo *et al.* 2006; Seminuk *et al.* in Press) and there would be general agreement amongst scientists and managers that food provisioning can lead to health problems for wildlife and/or pose risks to public safety. Thus following on from this the perceived disadvantages associated with feeding of wildlife can be divided into different areas including attraction, habituation, disruption, aggregation and inappropriate human behaviour. All of these can have short and or long term effects on individual species as well as wildlife populations (Fig.13).

Table 1. Problems associated with food supplementation of wildlife. Adapted from Newsome *et al.* (2005)

Perceived disadvantages	Context of problem
Attraction to feeding sites and presence of humans with food	Abnormal concentrations of individuals at a feeding site. Increased populations of provisioned species.
Habituation and creation of semi-domesticated states	Direct contact with and even handling of target species.
	Increased susceptibility of wildlife to injury and disease.
	Loss of fear of humans leading to pushy and aggressive behaviour with consequent public safety issues. Increased chance of offending animals having to be re-located or destroyed.
Disruption of normal activities concerned with foraging, breeding and predator avoidance	Disruption of proportion of time and energy devoted to foraging leading to dependence on provisioned foods.
	Less dominant species displaced by more aggressive species. Individuals may sustain wounds while competing for food
	Disruption of maternal care leading to reduced breeding success. Increase and regular supply of food resources leading to an increase in local breeding activity of adaptable species
Aggregation of nuisance species	Increased vigilance and displacement of smaller species due to presence of more aggressive dominant species and predators
	Potential for increased populations of gulls and corvids with subsequent decline in reproductive success of local resident species
Problems associated with facility development	Vehicle collision resulting in death of wildlife
	Site pollution at feeding stations
	Pollution of waters at fish feeding sites
Inappropriate human behaviour	Inappropriate foods and poor quality of provisioned foods leading to malnourishment and reduced body condition

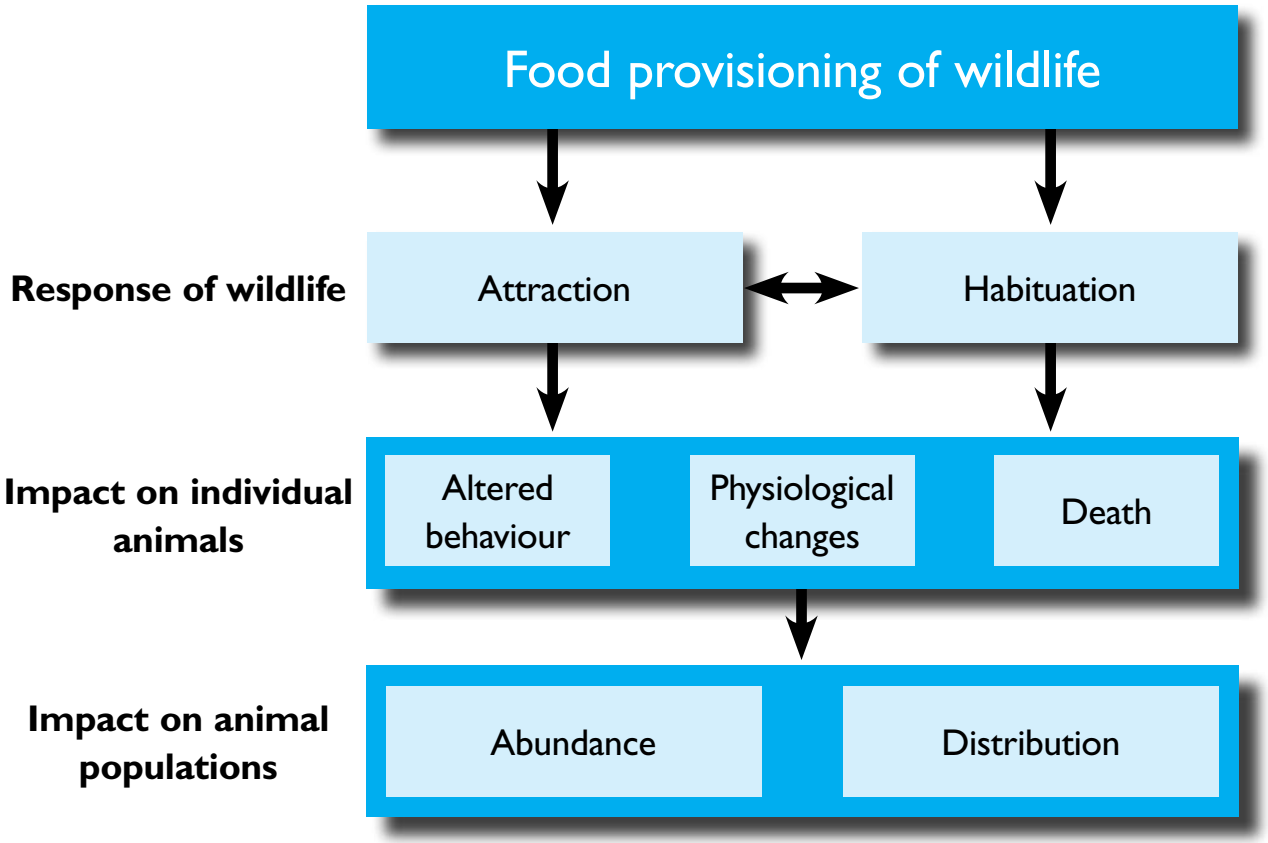

Figure 13. Potential and actual impacts on wildlife from food provisioning.

Habituation and attraction of wildlife

The process of habituation and attraction is typical of wildlife responses to feeding (Thompson *et al.* 2003). The loss of fear of humans can also result in changed behaviour. The attraction and habituation of wildlife through feeding can result in major public safety issues as the wildlife attracted to feeding sites may become aggressive towards humans (see Orams, 2002 and Newsome *et al.*, 2005 for detailed account). Some wildlife remain docile when frequently fed by tourists while others can become aggressive and can attack humans (Orams 2002; Newsome *et al.* 2005). The outcome is an increased chance of offending animals being relocated or destroyed.

It needs to be noted that attraction and habituation are two interrelated problems associated with the feeding of wildlife. Although they are discussed here as separate categories it is often difficult to determine which comes first, attraction or habituation. The EPA (2001) surmise the events leading up to the dingo attacks on people visiting Fraser Island, Australia as attraction > habituation > interaction > aggression. However, it could be suggested that habituation then results in attraction. As the animals become used to humans and less wary they then became confident enough to respond to the provisioning of food. Whittaker and Knight (1998) have raised the issue that habituation is often confused with attraction and emphasise that habituation is a waning of response and neutral while attraction is a positive reinforcement where an animal will be attracted to and, for example, associate with humans in order to acquire food. However, because habituation is where animals learn to become less sensitive to a given stimulus, animals can easily become habituated to human contact, particularly through feeding. This can result in animals becoming dependent on humans to feed them (Orams 2002). Such continual feeding can also create semi-domesticated wildlife. For example, on Rottnest Island, Western Australia quokkas *Setonix brachyurus* have become so habituated to humans and feeding they have little if any fear of humans (Fig. 14). Quokkas have even been observed stealing food from plates at the outdoor restaurants while diners look on (pers. obs. K. Rodger; Herbert 2007).

Figure 14. Illustration of unstructured feeding of quokkas on Rottnest Island, Australia. Even though management does not encourage this practice feeding is still a common occurrence. Photo. K. Rodger.

Attraction involves animals learning by association. Animals may begin to associate the presence of tourists with food and are attracted accordingly (Newsome *et al*. 2005). This can be the result of structured and unstructured feeding. In some circumstances the supplementary feeding is used to attract the wildlife. However, regular feeding can result in an increased number of animals at the feeding site. An example is the feeding of Komodo dragon in Indonesia. These large carnivores can be quite difficult to view in the wild. To overcome this difficulty goats were used to attract the dragons. This resulted in dragon numbers being at a level generally not found naturally. Due to the potential negative impacts feeding was prohibited in August 1994 (Walpole 2001).

The attraction of wildlife for food can result in increased injury or death to animals. For example, attraction and access by grizzly bears to human foods is still a fundamental cause of bears being killed or removed in certain North American national parks. In Banff and Yoho National Parks, Canada adult females and subadult male grizzlies are more prone to habituation to humans and attracted to human foods increasing their mortality risk as a result of road kill or their potential to be destroyed or relocated as nuisance animals (Benn and Herrero 2005). A further example of road kill problems associated with feeding is the case of Australian Cassowaries that are attracted to roads as a result of people feeding them. Crome and Moore (1990) found that traffic is a major killer of cassowaries in North-eastern Queensland.

The inadvertent feeding of wildlife, as discussed earlier, can also result in abnormal concentrations of individuals at a feeding site. For example, Marzluff and Neatherlin (2006) found populations of corvids including breeding American crows *Corvus brachyrhynchus* and common ravens *Corvus corax* at campsites in Washington's Olympic Peninsula reduced their home range size and enhanced breeding success resulting in increased abundance of these species.

Disruption of normal activities

The feeding of wildlife can result in disruption of normal activities, in particular the proportion of time and energy devoted to foraging. This is because food availability is the most important factor in deciding the amount of time spent on particular activities. When feeding of wildlife takes place animals need to spend less time foraging which therefore results in changes to other activities including breeding and socializing (Orams 2002). Hodgson *et al.* (2004) found that provisioned Mareeba Rock Wallabies *Petrogale mareeba* at Granite Gorge, North Queensland, Australia displayed higher rates of aggression and spend more time performing contact behaviours than non-provisioned groups. The differences in behaviour between the different groups was explained as competition for provisioned food and territorial defence.

The disruption to foraging can result in some species becoming completely dependent upon provisioned foods. Wilson (1994) reported on a dolphin at Monkey Mia which was so accustomed to being hand fed that it ultimately became completely dependent on provisioned food. Shackley (1998) observed the stingrays at 'Stingray City' in the Cayman Islands showing signs of 'hunger' on the days when divers cannot visit the site due to weather conditions suggesting that the natural foraging skills of the rays may have been distorted as a result of food provisioning. Moreover, rays were observed swarming over the tourists when they arrived resulting in minor injuries to rays as a result of divers panicking and accidentally colliding with the rays.

The feeding of wildlife can also result in changes to intra-species interactions such as social relationships that may result in animals being injured while competing for provisioned food. An example is the feeding of pelicans *Pelecanus conspicillatus* on the Gold Coast, Australia. Individual pelicans were seen to have long battles with each other, caught together by their beaks in an effort to obtain food (Fig. 15). In addition to this, when wildlife are fed by humans changes in the composition of animal communities may be seen. Larger more aggressive species or individual animals may displace the less dominant species. This is because the more aggressive species are likely to successfully access the human-provided food (Orams 2002). For example, at Hamelin Bay, Western Australia stingrays *Dasyatis thetidis* and *Dasyatis brevicaudata* were seen to fight over large pieces of fish offal. If the rays approached the provisioned food from a similar angle one will slide a pectoral fin under the other and forcefully push it away. Also if the eagle rays *Myliobatis australis* tried to approach the food they would be chased up the beach or in some cases the stingrays would pin them to the sand (Newsome *et al*. 2004).

Figure 15. Pelicans fighting over a fish. These two pelicans remained joined with neither willing to retreat until tourists stepped in to break them up. Photo. K. Rodger.

Food provisioning can also disrupt maternal care resulting in reduced breeding success. This was seen with dolphins at Monkey Mia, Western Australia where there was an increased mortality of juveniles due to decreased parental behaviour (Wilson 1994; Newsome *et al.* 2005).

Aggregation

The feeding of fish around Ustica Island Management Priority Area in the Mediterranean Sea demonstrates changes in the density and distribution of coastal fish species. Increased aggregation of fish as a result of feeding by the public may have negatively impacted upon on local populations of fish (Milazzo *et al.* 2005). In particular the aggregation of predatory fish due to food provisioning is considered to have a detrimental impact on the reproductive success of nesting damsel fish (Milazzo *et al.* 2006).

A well recognised problem associated with the feeding of wildlife is the presence of opportunistic and nuisance species (Higginbottom *et al*. 2003; Newsome *et al*. 2005). Increased vigilance is needed by smaller species due to the presence of larger or more aggressive dominant species. This can result in the displacement of the smaller and/or less aggressive species. Feeding can also attract a greater number of scavenging species. For example, the feeding of bald eagles *Haliaeetus leucocephalus* at sites such as at Homer in Alaska attracts not only a large number of eagles to the site but also other scavenging species including American crows *Corvus brachyrhynchos*, common ravens *Corvus corax*, coyotes *Canis latrans* and bobcats *Lynx rufus* (Gill 2002).

Feeding wildlife can result in being in a state of increased vigilance as well as increases in the vulnerability of some species to predation. This is particularly the case when feeding occurs in areas where there is little or no cover for vulnerable species to escape to.

High visitor numbers and nutritional issues

Where facilities and accommodation are developed there is always the risk of wildlife being attracted as a result of inadvertent and/or deliberate feeding. Linked with this is the loss of habituated wildlife on roads due to vehicle collision. Where structured feeding takes place site pollution at feeding stations can be a problem unless the interaction area is designed accordingly (Fig. 16). A critical management issue is the problem of ignorant or inappropriate human behaviour. The stingray study undertaken in 2004 at Hamelin Bay, Western Australia by Newsome *et al.* (2004) highlights many of the problems that can arise from the unsupervised feeding of wildlife. The stingrays were originally attracted to the beach for feeding of fish remnants and offal from returning commercial and recreational fishermen in the 1950s. This has grown over the years to include visitors who come with the sole purpose of feeding the stingrays (see Fig. 9). This study found that due to the increased feeding, stingrays are now vulnerable to increased risks due to attraction, habituation, inappropriate human behaviour and facility development. The stingrays face the risk of injury from boats, over feeding, injury from fishing hooks and lesions from over-handling. While at the same time the natural environment is vulnerable to pollution from decomposing fish and petrol spillage. The visitors were also identified as being at risk from this interaction with reports of bruised hands as a result of feeding the rays as well as increased risk of being stung by a ray (Newsome et *al*. 2004).

Figure 16. The feeding of birds at O'Reillys Guesthouse, Queensland. Here management strategies include the selling of seed to visitors and the construction of a designated paved feeding area that can readily be cleaned and maintained. Photo. K. Rodger.

An additional problem is the feeding of continuous amounts of the same or the wrong types of food resulting in the malnourishment of wildlife and reduced condition. Semeniuk *et al.* (2007) have examined the diet of provisioned stingrays in the Caymen Islands. They compared the blood fatty acid levels of provisioned and non-provisioned rays. It was found that the squid fed to rays does not provide a diet comparable to that of non-provisioned rays with respect to essential fatty acids. The long-term implications of such physiological condition remain unclear but the results suggest that fatty acid profiles can be a useful indicator for the future monitoring of food-provisioned stingrays. A similar study undertaken by Ishigame *et al.* (2006) in Brisbane, Australia examined the physiological effects of backyard feeding of Australian magpies *Gymnorhina tibicen* and found that the plasma cholesterol of wild magpies to be affected by backyard feeding. Ishigame *et al.* (2006) suggested that the current levels of food provisioning could influence the population ecology of magpies. However, a study of the foraging and breeding ecology of food-supplemented magpies conducted by O'Leary and Jones (2006) found that the birds were not reliant on supplemental feeding.

An additional example of the problems associated with feeding is the case of marmots and chipmunks in America. The quality and quantity of stored body fats are important in these animals for hibernation. If these animals are fed food high in saturated fats the fats can impede an effective hibernation resulting in increased mortality rates (Gill 2002).

Public views on feeding wildlife

Public perceptions on feeding of wildlife vary. Historically the feeding of wildlife has been common practice in the Northern Hemisphere where many wildlife agencies and conservation groups actively promote wildlife feeding as an important role in conserving wildlife, for example the British Trust for Ornithology and the Royal Society for the Protection of Birds actively encourage the feeding of birds

(Moore and Jones undated; O'Leary and Jones 2006). In Australia wildlife agencies are still mostly opposed to the provisioning of wildlife. Despite objections raised by government agencies and conservation groups, and the prohibition of feeding in most national parks, the provisioning of wildlife still remains popular in Australia (Orams 2002; O'Leary and Jones 2006).

A recent survey undertaken with marine and terrestrial wildlife tour operators in Australia found almost two-thirds of operators did not feed wildlife (Rodger *et al.* 2007). Yet, for tour operators the feeding of wildlife can contribute to the reliable viewing of wildlife. Wildlife operators base their tours on the predictable occurrence of species within a particular area (Duffus and Dearden 1990). The guaranteed close up interaction with wildlife adds value to the tourism product. Many tour operators oppose the prohibition of wildlife feeding as it could decrease visitor enjoyment (Moscardo *et al.* 2001). Smith *et al.* (2006) found that managers and tour operators felt the prohibition of dolphin feeding at Monkey Mia, Western Australia would detract from the quality of visitor experience.

The next perspective on feeding that needs to be considered is the visitor. For many tourists feeding of wildlife is still an important component of the human-wildlife interaction. They believe it is their right to feed the wildlife (Fig. 17). However recent studies have shown that seeing animals in their natural state is becoming important as well (see Croft and Leiper 2001; Smith *et al.* 2005). This is where the wildlife tourists' satisfaction comes from being in the presence of other animal species (Bentrupperbaumer 2005). Lewis and Newsome (2003) with their study on stingray tourism in Hamelin Bay, Western Australia found that seeing animals in their natural state was the most important aspect of the human-wildlife interaction while feeding ranked only sixth out of seven items. Yet when visitors to Hamelin Bay were asked on their management preferences if uncontrolled stingray feeding were to increase the most preferred option was education and regulation on feeding while the least preferred option was to prohibit all stingray feeding. The differing perspectives held by wildlife agencies, tour operators and tourists on wildlife feeding highlight the many difficulties management faces.

Figure 17. In some situations people feel it is their choice and perogative to be able to feed wildlife. This poster was positioned in the front window of a garage and retail outlet in Albany, Western Australia and reflects public indignation at the potential banning of feeding wild birds by a local tour operator. Photograph by D. Newsome.

Management of wildlife feeding activities

Context

Although Newsome *et al.* (2005 p209) state that 'management should aim to restrict formal feeding activities' the fact that wildlife is an important reason for many people visiting natural areas around the world, along with the educational, environmental protection and economic potential of tourism, food provisioning is likely to continue as an aspect of many wildlife viewing situations. A further reason for the likely continuance of feeding activities is that many countries promote their wildlife as part of tourism marketing strategies and that the global interest in nature based tourism is increasing along with increasing recognition that tourism can contribute to the conservation of species and their habitats. Furthermore, as international travel and tourism continue to rise people with expectations of feeding wildlife in one country may have expectations of feeding wildlife at some stage of their visit to their destination of choice. Recognition of this means that visitor expectations may have to met and managed and wildlife feeding activities selected that are suitable for different species and conditions. Management therefore has an opportunity to shape the feeding experience and the outcomes of visitor contact with wildlife. In support of this last assertion is the increasing evidence that the wildlife tourism visitor is increasingly expecting more authentic, well-managed and sustainable experiences (see Lewis and Newsome 2003; Smith *et al.* 2006).

The central issues that set the agenda for management lie in developing a management presence that can control access, visitor numbers and the viewing experience. How this reflects in the detail of practical management depends on the specifics of the situation. Of critical importance is the appropriate management of children and ignorance amongst adults as in both cases such conditions can lead to touching, manipulation via use of food items and even entertainment in order to elicit a reaction from the target species. The following case studies of formal bird, mammal and fish feeding situations serve to illustrate management approaches designed to minimize environmental impacts educate the public and foster sustainable tourism.

Management styles: some examples

Feeding wild birds

There is a strong tradition of feeding wild birds in the Northern Hemisphere ranging from casual backyard/village pond feeding through to structured feeding situations where people may congregate at feeding sites to watch wild birds being fed and/or engage in feeding birds themselves under controlled and supervised conditions. In other situations such as at Kingfisher Park, Julatten Australia, birds are attracted to water dishes, a fruit feeder, a seed feeder, nectar feeders and flowering shrubs. Staff service the entire feeding programme and visitors are not directly involved in the feeding process. More common, however, bird feeding involves public participation in some form or other with food being provided by site management and/or tourism operators.

Famous as a site for bird watching O'Reillys Guesthouse, Queensland, Australia has scheduled natural history programmes comprising bird watching tours. There is a strong commitment to environmental education and sustainable tourism. Bird feeding is a very important part of the ecotourism services offered by the guesthouse, which has a visitation profile of 300,000 per annum with the day visit component being 264,000 (Fig. 18). There are 36,000 overnight stays and 50-60% repeat visitation. Bird feeding has been in operation since the 1920's. Problems were recognized early on when day-trippers were feeding birds bread, chips and other unsuitable food items. Seed was provided in order to avoid this but coach drivers and some tourism operators were observed to be providing their own supply of the wrong mix of seed. As part of a strategy to counteract this in 1988, formulated seed was sold to visitors. This was combined with feeding under supervision at a designated feeding station and the construction of a paved feeding area that can be readily cleaned (See Figs 16 and 18).

Figure 18. The feeding of birds at O'Reillys Guesthouse, Queensland. Photo. D. Newsome.

Overnight visitors are also able to observe birds attending bowls of food placed outside the windows of the guesthouse dining room. The birds are given a mixture of fruit and vegetables at 8am and 1pm daily. Birds in attendance include the Regent Bowerbird *Sericulus chrysocephalus*, Satin Bowerbird *Ptilonorhynchus violaceus*, Green Catbird *Ailuoedus crassirostris* and Lewin's Honeyeater *Meliphaga lewinii*. In this instance there is no contact between people and the birds and the bowls are removed after each feeding session for cleaning and storage. In order to avoid wastage minimal amounts of food are provided and the use of high-sided bowls prevent spillage that might attract rats and mice. Interpretive signs provide information on bird ecology and conservation. In addition to this there is a private use walk trail where hotel guests can accompany a guide to view insectivorous birds being fed a meat mix. As with the bowls of food there is no direct contact between the birds and visitors and the guide provides an interpretive talk.

Wildlife restaurants

The concept involves putting food out at a designated feeding site with tourists viewing from a distance and usually from a concealed hide. This approach lends itself to the observation of shy and/or nocturnal, but food provisioned, wildlife with minimal disturbance with 'close contact' being achieved with the use of binoculars and telescopes.

In the case of nocturnal species a good example is the Tasmanian Devil which is normally difficult to observe because it is shy and nocturnal. The devil restaurant comprises a feeding station situated some 40 m from a viewing hide. This distance was selected following monitoring of animal behaviour and ensures minimal disturbance (Mooney 2005). Native animal road kills, which form part of the devils' natural diet, are located, removed and then placed at the feeding station under as hygienic conditions as possible. The use of telescopes combined with an intercom system gives visitors direct 'ownership' of the viewing experience. At 40 m distance visitors can enter and leave the hide without disturbing the devils and disrupting the viewing for anyone else. A guide supervises groups of up to 8 people. The entire experience is supported with an interpretation programme that explains vocalizations at the carcass and biology of the Tasmanian Devil. This is supported with the use of visual aids such as bones, plastic skulls, items chewed by devils, scats containing echidna spines and the sale of souvenirs such as Plaster of Paris footprints taken from the actual feeding station.

Feeding stations or restaurants are an increasing popular means of observing vultures in Asia and Europe. A site located in the Preah Vihear Protected Forest in Cambodia is becoming popular with the international bird watching circuit. Bookings are taken one week in advance to give sufficient time for a cow to be slaughtered and located at the feeding station. Tourists can stay at a camp located 1 km from the station and are then taken to hides by rangers in order to view the vultures feeding at the carcass. Vultures tend to stay in the area for 5-7 days with numbers peaking on days 2-4. Similarly bird watchers can visit a vulture restaurant in Bulgaria where a local farmer employs a similar concept to that described for Cambodia.

Best practice fish feeding

Despite the concerns raised by Milazzo *et al.* (2005; 2006), fish feeding is an established means of enhancing visitor experience in marine protected areas. Harriott (2002) notes the importance of tourism in the Great Barrier Reef marine Park with tourist visits peaking at around 1.7 million in 2000 with an associated tourism

value of $1 billion. Along with vessel and shore based operations is the use of tourist pontoons. The pontoons can cater for up to 400 day visitors at a time. Fish feeding has been part of their tourism profile that centres on snorkelling and diving. Best practice operation (Table 2) involves several components regulated according to permit and based on the observations of Sweatman (1996) who concluded that fish respond to the presence of humans and are attracted to the pontoon by feeding (Fig.19) but disperse away from pontoons when tourist boats are not present.

Dolphin feeding

The feeding of wild bottlenose dolphins at Monkey Mia provides a major focus for tourism in Shark Bay, Western Australia. Dolphins have been fed since the 1960's with a corresponding evolution of facilities and the development of the Monkey Mia Reserve Draft Management Plan and the Shark Bay Marine Reserves Management Plan (CALM, 1993; 1996). Current visitation runs at around 100,000 per year with up to 700 people assembling at the interaction site during peak periods (see Fig. 8). The current feeding programme, although highly controlled by management, is a major component of the overall dolphin tourism package. For example, a survey of visitors and management strongly suggests that preventing food provisioning would significantly reduce the quality of a visit to Monkey Mia (Smith *et al.* 2006). The current management strategy is based upon an extensive research programme (eg. see Wilson, 1994; Mann and Kemps, 2003; Bejder and Samuels 2003) and includes supervision of feeding by rangers within a designated interaction zone, controls over the quality of food and the amount and timing of feeding (Table 3). Education forms part of the official feeding programme and this is supported by the presence of a dolphin interpretation centre (Fig. 20).

Wild bottlenose dolphins have been provisioned at Tangalooma, a tourist resort on Moreton Island, Queensland, Australia since 1992 (Neil and Brieze 1998). Up to nine bottlenose dolphins have been recorded regularly attending the provisioning sessions. The Tangalooma Dolphin Management Program as discussed by Neil and Brieze (1998) comprises two components in the areas of education and food provisioning management:

1. Visitors intending to feed the dolphins must book at the Dolphin Education Centre on the afternoon preceding the night they wish to participate. One provisioning token per person is issued. Attendance at the centre provides opportunities for visitors to view publications and displays about marine mammals. There is also a small theatre and activities for children. Visitors are not allowed to provision dolphins unless they have a token.

2. Dolphin provisioning occurs at a specific area of the beach, marked by buoys. Signs landward and seaward state that the area is off-limits to swimming, fishing and boating activities at all times. Participants are required to be at the site 30 minutes prior to the scheduled feed time, and are given a briefing before the feeding regime. Briefings include behaviour in the presence of dolphins such as no touching, the need for minimising pollution such as avoiding the use of insect repellents and sun screens and reasons are given for the short period that visitors are allowed in the water.

Figure 19. The feeding of fish forms part of the natural attractions available at the Great Barrier Reef Marine Park and attracts more than 1.7 million tourists per annum. Photo. D. Newsome.

Table 2. Guidelines for fish feeding on the Great Barrier Reef. Adapted from Great Barrier Reef Marine Park Authority (1999).

No more than one fish feeding station to be operated at each site
Food to consist of fresh raw marine products and/or manufactured aquaculture fish food pellets approved by Great Barrier Reef Marine Park Authority
Total food used not to exceed 1kg/day or, where fish feeding is carried out at more that one site per day, 2kg/day
Fish to be fed only by tour operation staff and must not be fed directly by hand
Participants in the programme must be given practical and adequate warning of the potential dangers of fish feeding
Guidelines to be displayed at the fish feeding station

Table 3. Management of dolphin feeding at Monkey Mia, Western Australia. Adapted from Smith *et al.* (2006).

An exclusive dolphin interaction area has been designated in which boating and swimming are prohibited.
Human-dolphin interactions are supervised by rangers in order to prevent touching of dolphins by the public and in order to control the feeding activity.
Only adult female dolphins are offered fish, which helps to prevent male dolphins becoming aggressive, and using the situation to herd females. They are fed a maximum of 2kg of fish per day with no more than three feeds taking place per day. Feeding times vary between 8am and 1pm (this encourages dolphins to spend afternoons offshore, socialising and foraging for wild food) and are variable and dependent on when the dolphins come in-shore.
Fish used to feed the dolphins is caught in the local area, frozen and stored for no longer than 3 months. In order to minimise the risk of disease it is thawed immediately prior to being fed to the dolphins.
In preparation for feeding, rangers ask visitors to move out of the water; buckets are then bought down to the water and each ranger takes a bucket to a specific female. The feeding begins with rangers selecting one person at a time and asking them to approach each bucket. The ranger hands each person a fish and they feed it to the dolphin head-first. After they have given the fish to the dolphin, they are asked to leave the water immediately so the next person can be called. The last fish is offered to each dolphin simultaneously to any avoid competition. After the final fish is offered, the buckets are tipped over and dipped in the water to show the dolphins that the feed is over. The entire feeding regime usually takes three to five minutes. The dolphins almost always leave the dolphin interaction area within five minutes after the feed.
Any feeding of dolphins is prohibited outside the designated interaction area and feeding from boats is strongly discouraged.
Visitor information is given during the dolphin interaction. Rangers impart information via a public address system broadcast at the beach during the interaction about dolphin biology, behaviour, the feeding regime and also provide information to prevent inappropriate dolphin interactions.

Figure 20. Monkey Mia Dolphin Interpretation Centre. Such facilities facilitate the delivery of education and interpretation. Information can be presented on local fauna and flora and there is the opportunity for face-to-face contact with staff. A particular advantage is the potential for the application of a wide range of techniques including audiovisual presentations, interactive displays and the opportunity to handle various objects such as bones, skulls and models (Newsome et al. 2002). Photo. D. Newsome.

The educational component of the dolphin-feeding program at Tangalooma was used by Orams (1997) as an opportunity to assess the effectiveness of environmental education as a mechanism to promote ecologically desirable changes in the attitudes and behaviour of tourists. He concluded that both visitor enjoyment and knowledge increased following the education programme. Orams (1997) also found that the structured education programme was more likely to increase environmentally responsible behaviour. This work is an example of the importance of education programmes in informing the public about how to behave and can increase their knowledge of wildlife biology in food provisioning situations. This vital aspect of management is reinforced by Newsome *et al.* (2005) who note the value of education and interpretation in increasing visitor knowledge, reducing impacts, increasing satisfaction and fostering a greater respect for wildlife.

Conclusion

This chapter has explored the complexities and controversy surrounding the feeding of wildlife, especially from the standpoint of tourism operations. The situation is further complicated by the different attitudes and expectations of the wildlife feeding public in that while many wish to simply 'consume' a wildlife encounter there are others whose intent lies in experiencing animals under natural conditions and behaving in a setting of minimal manipulation. Having said this it is important to recognize that feeding is an important means of 'connecting' with wildlife.

Given that there are recognized advantages and disadvantages to the feeding of wildlife, the material explored in this chapter can lead to the development of guidelines that become important in deciding whether to feed or not. Moreover, principles can be designed that can be utilized in setting the agenda for the approval and/or continuance of wildlife feeding in tourism situations.

It is therefore recommended that it is not acceptable to feed wildlife under the following conditions:

- Where there is an absence of management
- Where there is an absence of education and interpretation
- Where there is an absence of risk assessment where humans come into contact with large carnivorous species
- Where target species are likely to be strongly attracted to humans

- Where there is a significant risk of dependence on feeding
- Where there is distortion of natural behaviour that is likely to lead to the activity budget of a particular species being compromised
- Where scientific evidence suggests that the body condition of provisioned species is being compromised

Conversely it can be argued that it is acceptable to feed wildlife when the following conditions are operational:

- Where there is management presence
- Where there are educational and interpretive strategies in place
- Where management show awareness of visitor expectation (e.g. the importance of feeding to the visitor)
- Where the feeding programme builds upon natural foraging behaviour
- Where a feeding interaction plan forms the basis of the feeding programme
- Where there is monitoring and review of operations

With regard to the acceptability of feeding, it would appear that on, a global scale, birds appear (eg Julatten O'Reillys, Slimbridge) the most suitable candidates for structured feeding operations. There are two final points to be made. The first being that developing a feeding situation for tourism purposes must always be treated with caution and, if developed, be subject to review in the light of new information on the benefits or otherwise of the feeding situation. The second point being that feeding operations should be based upon the fostering of respect and appreciation of natural values and not entertainment.

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Numbers of human fatalities, injuries, and illnesses in the United States due to wildlife

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Abstract: I reviewed published and unpublished papers, government reports, and websites to estimate how many people are injured or killed each year by wildlife or stricken by a zoonotic disease. Over 47,000 people annually in the United States sought medical attention after being attacked or bitten by wildlife, and approximately 8 people died annually. Most bites were by snakes, birds, rodents, and raccoons (*Procyon lotor*). Each year, wildlife–vehicle collisions resulted in >59,000 human injuries and >440 human fatalities, while wildlife–aircraft collisions added 16 more injuries and 10 fatalities. I also found that >68,000 people each year sought medical assistance for a zoonotic disease, and 243 of these cases were fatal. When wildlife-related casualties and fatalities are summed, >174,000 people were injured or sickened and >700 were killed by wildlife annually. These figures do not mean that wildlife populations should be reduced; they do indicate, however, that wildlife biologists have an opportunity to serve society by preventing human injuries, morbidities, and fatalities resulting from wildlife. In doing so, wildlife biologists will also be protecting the future of wildlife.

Key words: aircraft collisions, bird–airplane collisions, deer–vehicle collisions, fatalities from wildlife, predator attacks on humans, wildlife–vehicle collisions, wildlife–human conflicts, zoonotic diseases

Wildlife causes numerous human injuries and fatalities by attacking or biting people, colliding with vehicles, striking aircraft, and serving as vectors or reservoirs for zoonotic diseases. Only a small fraction of human–wildlife interactions result in human injury or death, but the loss of even 1 person is a tragedy. These incidences often attract a great deal of media coverage and can have a large impact on public perception of wildlife (Wolfe 2008).

The most recent national assessment on the number of human injuries and fatalities from wildlife was conducted 17 years ago (Conover 2002). Hence, the current magnitude of the problem in the United States is unknown. This reduces our ability to allocate effectively scarce resources to mitigate the risk to humans posed by wildlife. Consequently, the goal of this paper is to determine the current number of human fatalities, injuries, and morbidity annually in the United States due to human–wildlife interactions at the time of this study (2018).

Methods

I define wildlife as terrestrial wildlife (reptiles, birds, and mammals). Most medical records do not distinguish between free-ranging animals and captive animals. Hence, I cannot do so either. For most wildlife, this does not provide a problem because most wildlife species are not kept as pets. But snakes are kept as pets, and snake-bite victims include people bitten by both free-ranging snakes and pets. I provide information on the proportion of injuries from free-ranging animals when it is available. I defined a zoonotic disease as a human disease for which that pathogen uses animals as either a reservoir or vector but excluded those that are primarily spread by human-to-human contact.

My goal was to determine the most accurate data on the extent of human fatalities, injuries, and morbidity in the United States from wildlife. To obtain these data, I searched for unpublished reports and those published in peer-reviewed journals containing information on the extent of human fatalities, injuries, and morbidity in the United States by using Google Scholar, Google, and websites of wildlife agencies. Once an article on the subject was located, I searched its literature cited section for data and other additional pertinent literature. Most journal websites also provide information about where their articles have been cited since publication. These articles were likewise searched to locate pertinent articles. I also searched the World Health Organization and Centers for Disease Control and Prevention (CDC) websites and publications for information. Of

special importance was the CDC's publication, Morbidity and Mortality Weekly. Some sources on attacks on humans by large predators did not provide separate data for just the United States, but instead reported data for North America, usually meaning the United States and Canada. I included these sources but identified the area of the study as North America rather than the United States.

My literature search usually produced several reports about the frequency or incidence of attacks by a particular species, wildlife–vehicle collisions, bird–aircraft collisions, or a zoonotic disease that differed by the year the data were collected. In these cases, I reported the results of all studies so that readers could compare them. When there were multiple sources, I needed to determine which study provided the most accurate data on current conditions for the United States. Hence, I used the most recent data and the data that covered the greatest proportion of the country. Sometimes, I was able to combine data from different studies when they covered non-overlapping parts of the United States. For example, state wildlife agencies report how many people in their state were bitten by alligators (*Alligator mississippiensis*). By combining these state reports, I was able to gain an accurate estimate of the number of people bitten by alligators within the entire United States.

Studies often differed in the method used to assess the extent of the problem. For example, data on zoonotic diseases often can be obtained from 4 sources: (1) cases submitted to the CDC for reportable diseases, (2) doctor reports to state health agencies in those states where such reports are required by law, (3) patient visits to hospital emergency rooms, and (4) queries to poison-control centers in the United States. In such cases, I used the data that represented the greatest proportion of the patient population and relied on sources in the same order they appear above (i.e., 1, 2, 3, and 4) because that is the order of the completeness of their coverage. Reportable diseases (#1 above) are those diseases and medical problems for which medical providers are required by federal law to report them to federal health agencies. Data on reportable diseases, therefore, cover most U.S. patients where a diagnosis was made. Excluded from these data are victims that did not seek medical attention and patients whose disease was misdiagnosed. Some states require doctors to report additional diseases or medical problems (such as a bite by a wildlife species), but this varies among states. Hence, these data (#2 above) are not complete for the entire United States but represent a collection of states. It is for this reason that I used CDC data over state data in trying to determine data for the entire country. Data on patient visits to emergency rooms or calls to poison-control centers cover a large proportion of the United States but only include victims who seek their services. The problem with these 2 data sources is that it is unclear what proportion of victims utilize these services.

Results

Injuries from attacks and bites by wildlife species

Snakes. Several sources provided information on the number of people bitten by snakes in the United States. The CDC (2016) estimated that 6,000–8,000 people are bitten by a venomous snake each year, and Forrester et al. (2018) found that 6 snakebite victims die annually in the United States. The American Association of Poison Control Centers was an association of 61 poison control centers, which covered 300 million U.S. residents (Langley 2008). They received annually an average of 6,803 calls from snakebite victims and 1,050 calls from victims of other reptiles from 2001 to 2005 (Langley 2008). What proportion of snakebite victims in the United States called poison control centers was unknown, but it was possible to use the data to determine which species of snakes bit people; 2,409 people identified the snake that bit them. Of these, 1,193 people were bitten by rattlesnakes (Viperidae), 869 by copperheads (*Agkistrodon contortrix*), 173 by cottonmouths (*Agkistrodon piscivorus*), and 82 by coral snakes (Elapidae). During this same 5-year period, 27 human fatalities from snakebites were reported to poison control centers, including 3 bites from timber rattlesnakes (*Crotalus horridus*), 2 from eastern diamondback rattlesnakes (*Crotalus adamanteus*), 3 from rattlesnakes of unknown species, 4 from pit vipers of unknown species, and 15 from unknown species (Langley 2008). At the same time, an average of 9,015 people visited emergency rooms annually seeking

Table 1. Best estimate of the annual number of people injured or killed in the United States after being bitten or attacked by wildlife, involved in a wildlife–vehicle collision, wildlife–aircraft collision, or sickened by a zoonotic disease. These data only include people who sought medical attention and they had a reportable disease (i.e., one that the doctor was required by law to report to state and federal health agencies). The disease statistics include both confirmed and probable cases in humans.

Causes	No. injured or sickened	No. killed	Sources
Snakes (nonvenomous)	6,135	0	O'Neil et al. (2007)
Snakes (venomous)	7,000	6	Centers for Disease Control and Prevention (2016)
Alligators	9	1	Florida Fish and Wildlife Conservation Commission (2018), Texas Parks and Wildlife (2004)
Reptiles (excluding snakes)	1,050	?	Langley (2008)
Birds (excluding parrots)	1,594	0	O'Neil et al. (2007)
Bats	1,335	0	O'Neil et al. (2007)
Rodents	27,000	0	Conover et al. (1995)
Opossum	375	0	O'Neil et al. (2007)
Skunk	750	0	Conover et al. (1995)
Raccoons	1,310	0	O'Neil et al. (2007)
Foxes	500	0	Conover et al. (1995)
Coyotes	9	0.1	Timm et al. (2004)
Wolves	0.7	0.1	Wikipedia (2018*a*)
Cougars	3.3	0.3	Wikipedia (2018*b*), Penteriani et al. (2016)
Black bears	25	0.3	Herrero (1985)
Grizzly bears	0.8	?	Smith and Herrero (2018)
Polar bears	0.1	0	Smith and Herrero (2018)
Bison	1.7	0	Cherry et al. (2018)
Elk	3.0	0	Conover (unpublished)
All bites and attacks	47,102	7.8	
Deer–vehicle collisions	58,622	440	This paper
Moose–vehicle collisions	640	6	This paper
Bird–vehicle collisions	10	1	This paper
Wildlife–civilian aircraft collisions	16	1	Thorpe (2012)
Wildlife–military aircraft collisions	?	9	Conover et al. (1995)
All collisions	59,288	457	
Zoonotic diseases	68,509	243	
All causes	174,899	708	

treatment for snakebites, including 6,315 cases for bites by nonvenomous snakes and 2,820 by venomous snakes (O'Neil et al. 2007). I have reported 7,000 (Table 1) because it is the mean of data provided by the CDC (2016).

Alligators, other reptiles, and birds. Alligators injured 567 people and killed 24 in the United States from 1948 to 2009 (Table 2). Most attacks occurred in Florida where alligators are abundant. Crocodiles posed a much greater problem in other countries than alligators, but there have been no crocodile attacks reported in the United States. (Langley 2010). The U.S. poison control centers received an average of

Table 2. Studies of the annual rate of nonfatal and fatal injuries to humans by wildlife in different parts of the U.S. and Canada. Excluded are injuries for which the victim did not seek medical attention.

Species	Location	Years of study	Injuries/year		Reference
			Nonfatal	Fatal	
Venomous snakes	United States	2015	7,000	5	CDC (2016)
	United States	2001–2004	2,820	0	O'Neil et al. (2007)
	United States	2008–2015	?	6	Forrester et al. (2018)
Nonvenomous snakes	United States	2001–2004	6,135	0	O'Neil et al. (2007)
American alligators	United States	1948–2009	7	0.3	Langley (2010)
	United States	1990–1995	18	0.3	Conover and DuBow (1997)
	Florida	1948–1992	3.5	0.1	GutierrezSanders (1992)
	Florida	2018	8	1	Florida Fish and Wildlife Conservation Commission (2018)
	Texas	1989–2004	1	0	Texas Parks and Wildlife (2004)
Reptiles (excluding snakes)	United States	2001–2005	1,050	?	Langley (2008)
Birds (excluding parrots)	United States	2001–2004	1,594	0	O'Neil et al. (2007)
Bats	United States	2001–2004	1,335	?	O'Neil et al. (2007)
Rodents	United States	2001–2004	15,832	?	O'Neil et al. (2007)
Mice	United States	2001–2004	4,075	?	O'Neil et al. (2007)
Rats	United States	2001–2004	5,383	?	O'Neil et al. (2007)
Squirrels	United States	2001–2004	3,126	?	O'Neil et al. (2007)
Rats	United States	2008–2015	?	0	Forrester et al. (2018)
Opossum	United States	2001–2004	375	?	O'Neil et al. (2007)
Skunks	United States	1971–1972	750	0	Conover et al. (1995)
	United States	2001–2005	261	0	Langley (2008)
Raccoons	United States	2001–2004	1,306	0	O'Neil et al. (2007)
Foxes	United States	1971–1972	500	0	Conover et al. (1995)
Wolves	North America	2000–2018	0.7	0.1	Wikipedia (2018*a*)
Coyotes	California	1989–1993	1.4	0.2	Timm et al. (2004)
	California	1999–2003	9.2	0.0	Timm et al. (2004)
	North America	1960–2006	3.5	0.02	White and Gehrt (2009)
	North America	2004–2015	7.2	?	Penteriani et al. (2016)
Black bears	United States	1960–1980	25	0.3	Herrero (1985)
	Alaska	2005–2015	6.7	?	Smith and Herrero (2018)
	British Columbia	1960–1997	0.4	0.2	Herrero and Higgins (1999)
	Alberta	1960–1998	0.2	0.1	Herrero and Higgins (2003)
	North America	1960–2009	?	1.2	Herrero et al. (2011)
	North America	2000–2009	?	1.7	Herrero et al. (2011)
	North America	2004–2015	1.2	?	Penteriani et al. (2016)

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Grizzly bears	North America	1900–1980	3.7	0.5	Herrero (1985)
	North America	2004–2015	2.2	?	Penteriani et al. (2016)
	British Columbia	1960–1997	1.1	0.2	Herrero and Higgins (1999)
	Alberta	1960–1998	0.6	0.2	Herrero and Higgins (2003)
	Alaska	2005–2015	0.8	?	Smith and Herrero (2018)
Polar bears	Alaska	2005–2015	0.1	?	Smith and Herrero (2018)
Cougars	United States	1890–1990	0.2	0.05	Beier (1991)
	North America	1890–2001	0.7	0.15	Linnell et al. (2002)
	North America	1991–2000	2.7	1.2	Linnell et al. (2002)
	North America	2000–2018	?	0.3	Wikipedia (2018*b*)
	North America	2004–2015	3.0	?	Penteriani et al. (2016)
	California	1986–1995	0.9	0.2	Mansfield and Charlton (1998)
Bison	Yellowstone National Park	1978–1992	3.7	0.1	Conrad and Balison (1994)
	Yellowstone National Park	2000–2015	1.7	0.0	Cherry et al. (2018)
Elk	Yellowstone National Park	2018	3.0	0.0	Conover (unpublished)

1,050 calls annually from 2001 to 2005 from people bitten by reptiles (Langley 2008). From 2001 to 2004, an average of 1,594 people visited U.S. emergency rooms for treatment of bird bites (excluding bites by parrots).

Rodents and small mammals. State laws required doctors in 14 states (New Hampshire, Massachusetts, New York, New Jersey, South Carolina, Georgia, Florida, Kentucky, Indiana, Illinois, North Dakota, South Dakota, Texas, and Arizona) to report to public health officials when someone had been bitten by an animal (Moore et al. 1977). Because these states were widely distributed across the country, the results could be extrapolated to the other 36 states with some degree of confidence (Conover et al. 1995). However, these data were conservative because they only included serious bites for which the victim sought medical attention; they did not include bites for which the person did not seek medical assistance. About 27,000 people annually sought medical attention for a rodent bite, 750 for a skunk bite, and 500 for a fox bite (Moore et al. 1977, Conover et al. 1995). These attacks far exceeded the number of attacks by large predators but received less media attention because bites by small mammals were seldom newsworthy. From 2008 to 2015, no one in the United States died from a rat bite, but there were 3 fatalities from 1999 to 2007 (Forrester et al. 2012, 2018).

More recently, O'Neil et al. (2007) provided data on the annual number of people that sought treatment at U.S. emergency rooms annually for animal bites. The scientists found that 1,335 patients were bitten by a bat, 375 by an opossum (*Didelphis virginiana*), 1,310 by a raccoon (*Procyon lotor*), and 15,832 by a rodent. The rodent bites included 4,075 by a mouse, 5,383 by a rat, 3,126 by a squirrel, and 1,541 by another rodent. In total, O'Neil et al. (2007) reported fewer U.S. patients bitten by a rodent than the 27,000 estimated by Conover et al. (1995) because O'Neil et al. (2007) only reported visits to emergency rooms while Conover et al. (1995) included all doctor visits. I have used 27,000 as the reported number (Table 1) because I believe it to be the more accurate estimate.

Wolves and coyotes. Coyotes (*Canis latrans*) normally prey upon small mammals or the young of ungulates and livestock, which coyotes kill by clamping their jaws on the prey's throat and neck, preventing the victim from breathing. Occasionally, a person is killed by a coyote. Attacks on children are usually predatory, but coyote attacks on adults are not.

Coyote attacks on humans have increased over time. From 1999 to 2003, 46 children and adults were attacked by coyotes in California (Table 2); this compared to only 7 attacks from 1989 to 1993 (Timm et al. 2004). Across North America, there were 159 victims of coyote attacks from 1960 to 2006 (White and Gehrt 2009). There were 2 fatalities: a child in California and a grown woman in Canada; both were predatory attacks (NBC News 2010).

Wolves (*Canis lupus*) are much larger than coyotes and are efficient killers of large mammals, such as deer (*Odocoileus* spp.), elk (*Cervus canadensis*), and moose (*Alces alces*). Wolf populations are expanding in North America, both naturally and with the help of reintroduction efforts. There have been 2 fatal wolf attacks recently in North America. Kenton Joel was a 22-year-old engineering student and was killed during 2005 while hiking in northern Saskatchewan. The other victim was Candice Berner, a 32-year-old school teacher, who was killed during 2010 while jogging in Alaska (NBC News 2010).

Cougars. During the last century, 53 humans were attacked by cougars (*Felis concolor*), resulting in 11 human deaths (Seidensticker and Lumpkin 1992), but the frequency of cougar attacks on humans has increased in recent years. Only 3 people were injured by cougars in California from 1890 to 1985 (Mansfield and Charlton 1998), but that many have been attacked annually in the United States from 2004 to 2018, and a human death occurs on average every 3 years (Tables 1 and 2).

Bears. Black bears (*Ursus americanus*), grizzly bears (*Ursus arctos*), and polar bears (*Ursus maritimus*) all pose threats to people. About 30 people are attacked in North America annually by bears (Table 2). In Alaska, bear attacks averaged 7.6/year during the last decade with 88% of these involving grizzly bears, black bears 11%, and polar bears 1% (Smith and Herrero 2018).

Across North America, black bears injure more humans than any other bear species. Black bears have killed 54 people between 1960 and 2009 with most occurring in Canada and Alaska. Polar bears have attacked 6 people in the United States and 38 in Canada from 1870 to 2014 (0.3 attacks per year). Polar bear attacks have become more common in recent decades; there was 1 attack per year from 1960 to 2009 and 3 attacks per year from 2010 through 2014, perhaps due to a reduction of sea ice from global warming (Herrero and Higgins 1999, 2003; Wilder et al. 2017). Most (59%) polar bear attacks on humans were predatory in nature; 61% of attacking bears were in poor health. Predatory attacks were more likely to result in a human fatality. Most grizzly bear attacks that result in serious human injuries or fatalities are defensive in nature and involve a female with young. Most fatal black bear attacks (88%) were predatory in nature and involved a single bear (usually male); most victims were alone when attacked (Herrero 1985, Wilder et al. 2017).

Large herbivores. There is a paucity of information about how frequently people in the United States are injured by free-ranging herbivores. One exception is Hubbard and Nielsen (2009); they reported that people at Southern Illinois University were attacked by female white-tailed deer (*Odocoileus virginianus*) that were defending their fawns hiding nearby. Moose also attack people when they feel threatened. During the 1990s, 2 people were killed by moose in Anchorage, Alaska; a man was stomped to death on the University of Alaska campus, and a woman was trampled to death in her yard (Conover 2002).

American bison (*Bison bison*) injure more people than any other wildlife species in Yellowstone National Park (Oliff and Caslick 2003). Bison injured 56 people and killed 2 people in Yellowstone National Park from 1978 to 1992 and injured 25 people from 2000 to 2015 (Table 2). Victims were an average of 3.4 m (range 0.3 to 6.1 m) away from the bison when attacked, despite park regulations requiring people not to approach within 23 m of a bison. Eighty percent of victims were approaching the bison when attacked and half were trying to take a photograph. Of the 25 injured people, 10 people were thrown into the air, 9 were head-butted, and 6 were gored; almost half (48%) required hospitalization (Cherry et al. 2018).

Human injuries and fatalities from wildlife–vehicle collisions

Each year, thousands of people are injured when their vehicle collides with a wild animal. State Farm Insurance Company (2018) reported 1,332,322 claims were filed annually with

Table 3. Annual number of deer–vehicle collisions in each state that were reported to insurance companies from July 1, 2015 through June 30, 2016 and the percent of all drivers that filed an accident claim with their insurance company stating that they had collided with a deer during the same 1-year period (based on data from State Farm Insurance Company [2018]).

State	Number of collisions	Probability of a collision (%)
Alabama	28,794	0.74
Alaska	1,135	0.21
Arizona	4,155	0.01
Arkansas	22,100	1.04
California	23,316	0.09
Colorado	14,782	0.38
Connecticut	8,118	0.32
Delaware	4,948	0.68
District of Columbia	609	0.15
Florida	15,390	0.11
Georgia	52,819	0.79
Hawaii	48	0.01
Idaho	7,668	0.68
Illinois	43,634	0.52
Indiana	32,779	0.74
Iowa	32,559	1.47
Kansas	16,181	0.80
Kentucky	29,156	0.80
Louisiana	11,031	0.33
Maine	7,357	0.72
Maryland	29,716	0.72
Massachusetts	7,500	0.15
Michigan	87,702	1.18
Minnesota	42,207	1.25
Mississippi	22,733	1.15
Missouri	36,770	0.85
Montana	13,316	1.72
Nebraska	10,509	0.76
Nevada	1,765	0.10
New Hampshire	4,590	0.43
New Jersey	24,617	0.40
New Mexico	3,042	0.21
New York	70,405	0.62
North Carolina	61,047	0.87
North Dakota	5,773	1.10
Ohio	62,874	0.79
Oklahoma	12,605	0.51
Oregon	11,661	0.42
Pennsylvania	133,817	1.49
Rhode Island	2,167	0.29
South Carolina	39,052	1.07
South Dakota	8,765	1.43
Tennessee	31,408	0.68
Texas	54,408	0.34
Utah	9,511	0.67
Vermont	3,114	0.57
Virginia	61,141	1.06
Washington	17,612	0.33
West Virginia	28,354	2.44
Wisconsin	54,597	1.30
Wyoming	5,012	1.18
U.S. total	1,309,288	0.61

insurance companies for accidents involving deer–vehicle collisions (DVCs) during a 12-month period stretching from June 2017 to July 2018. Given the 212 million drivers in the United States, each driver has a 0.6% chance each year of filing a claim with an insurance company because of damage from a DVC. Only about half of all DVCs are reported to insurance companies or to the police (Decker et al. 1990, Marcoux and Riley 2010); hence, the actual number of DVCs occurring annually in the United States could be closer to 2.6 million annually, and the actual risk of a driver being involved in a DVC could be approximately 1.2% each year.

Annual numbers of DVCs reported to insurance companies vary by state (Table 3) with the most occurring in states with both large populations of deer and people. The most occurred in Pennsylvania (133,817), Michigan (87,702), and New York (70,405), while the

fewest collisions were in Hawaii, District of Columbia, and Alaska. The probability of a driver having a DVC was highest in states with high deer densities and a high proportion of the state's population living in rural areas (Table 3). Such states included West Virginia (2.4% of drivers annually), Montana (1.7%), Pennsylvania (1.5%), Iowa (1.5%), South Dakota (1.4%), and Wisconsin (1.3%).

Conover et al. (1995) estimated that 29,000 people in the United States were injured yearly in a DVC, and 200 people lost their lives. More recently, U.S. Centers for Disease Control and Prevention (2004) and Conn et al. (2004) reported that each year 26,726 people visited an emergency medical facility for injuries from a DVC, based on data from 2001 and 2002. Given the 1,332,322 reported DVCs, 2.0% of DVCs result in a person injured serious enough to visit an emergency medical room. Based on state highway safety data, 60,000 reported DVCs in Michigan resulted in 1,880 injuries (3.1% of DVCs) and 7 fatalities (Marcoux and Riley 2010). In Alabama, 8% of 27,780 DVCs resulted in a human injury (Hussain et al. 2007). Bissonette et al. (2008) reviewed databases for 20,873 people involved in DVCs in Utah; 2.1% visited a hospital and 0.2% were hospitalized overnight. The average of these injury rates for 3 states (3.1%, 8%, and 2.1%) is 4.4%. When 4.4% is multiplied by the 1,332,322 number of reported accidents, the results indicate that 58,622 people are injured in DVCs annually: double the rate reported by the CDC. I believe that this value is probably a more realistic record of total injuries because many victims do not visit emergency medical facilities.

In Michigan, 0.01% of DVCs resulted in a fatality (Marcoux and Riley 2010), as did 0.01% of DVCs in Alabama (Hussain et al. 2007) and 0.04% in Utah (Bissonette et al. 2008). The average of these 3 fatality rates is 0.033%; this average rate multiplied with the annual number of collisions (1,332,322) indicates there are 440 human fatalities each year from DVCs (Table 1).

Moose are much larger than deer, weighing up to 725 kg and standing 2.3 m at the shoulder—tall enough so that during a moose–car collision, the car's hood strikes a moose's legs while the moose's body and head crash into the windshield. Hence, moose collisions are more likely than a deer collision to result in a human fatality (Pelletier 2006). There are an unknown number of collisions with moose in the United States, but Pelletier (2006) found that there were about 3,400 moose collisions in Maine during a 5-year period (2000–2004). These collisions resulted in 1,600 injuries and 17 fatalities or 320 injuries and 3 fatalities annually. Moose occur in many states bordering Canada and in the Rocky Mountains. Information on moose–vehicle collisions in these states is lacking, but I assume that their frequency in these states combined at least equals the number occurring in Maine. Hence, I estimate in the entire country, moose–vehicle collisions are at least 640 human injuries and 6 fatalities annually.

Each year, there are between 89 million and 340 million bird–vehicle collisions in the United States (Loss et al. 2014). These collisions may result in a broken windshield or dented fender, but some drivers may have swerved to the point where the vehicle collides with something else much larger than a bird. These secondary collisions undoubtedly result in a few, but unknown number of human injuries and fatalities. I think it is safe to assume that the millions of bird–vehicle collisions annually result in at least 10 human injuries and 1 human fatality (Table 1).

Fatalities and injuries from wildlife–aircraft collisions

From 1990 to 2015, there were 616 bird strikes with civilian aircraft in the United States that resulted in damage to the aircraft, 229 strikes that injured 400 people, and 12 strikes that killed 26 people. Large birds were responsible for most of the human injuries for which the animal could be identified; these included 117 injuries with Canada geese (*Branta canadensis*), 42 with vultures (Cathartidae), 31 with ducks (Anatidae), and 22 with gulls (Laridae; Dolbeer et al. 2014, 2016).

The U.S. Air Force reported an average of 3,200 bird–aircraft collisions yearly (Conover et al. 1995). From 1987 to 1993, 7 deaths were attributed to bird strikes with U.S. Air Force planes, but in 1995, 24 people lost their lives when a single AWAC aircraft collided with a flock of Canada geese in Alaska. These data amount to an average of 3.1 fatalities/

Table 4. Number of human cases and fatalities during 2015 among U.S. residents from zoonotic diseases that are reportable diseases: those that doctors are required by law to report to the health authorities. Human cases include both confirmed and probable cases. In some cases, U.S. residents acquired the pathogens while traveling abroad. An unknown proportion of these zoonotic disease cases are related to wildlife. Some zoonotic diseases, such as hantavirus, are not included because they are not reportable diseases. Most data are from CDC (2016), but fatality data for arboviral diseases came from Adams et al. (2016, 2017). Statistics for West Nile virus and other arboviral diseases are reported for 2017 (Curren et al. 2018).

Diseases	Human cases	Fatalities
Anthrax	0	0
Arboviral diseases	3,181	152
Chikungunya virus disease	896	?
Eastern equine encephalitis virus disease	5	2
Jamestown Canyon virus disease	75	2
La Crosse virus disease	63	0
Powassan virus disease	34	2
St. Louis virus disease	11	0
West Nile virus disease	2,097	146
Babesiosis	2,100	7
Ehrlichiosis/Anaplasmosis	5,137	13
Anaplasma phagocytophilum infection	3,656	?
Ehrlichia chaffeensis infection	1,288	?
Ehrlichia ewingii infection	14	?
Undetermined ehrlichiosis/anaplasmosis	179	?
Giardiasis	14,485	1
Hantavirus infection, non-Hantavirus pulmonary syndrome	3	?
Hantavirus pulmonary syndrome	21	5
Lassa viral hemorrhagic fever	1	?
Leptospirosis	40	?
Listeriosis	768	36
Lyme disease	38,069	15
Plague	16	0
Psittacosis	4	0
Q fever, total	156	3
Acute	122	?
Chronic	34	?
Rabies (human cases)	2	2
Spotted fever rickettsiosis	4,198	8
Tularemia	314	1
Trichinellosis	14	0
Total	68,509	243

year from 1987 to 1997. U.S. Navy officials estimate that the number and cost of bird–aircraft collisions for the Navy are similar to those for the Air Force, because the Navy flies along the coast where bird strikes are more likely. The U.S. Army has more aircraft than the U.S. Air Force, but data for collisions with Army aircraft are lacking. Using U.S. Air Force fatality rates for all branches of the armed forces yields an estimate of approximately 9 deaths/year due to bird strikes (Table 1).

Morbidity and mortality from zoonotic diseases

A zoonotic disease is one that infects both humans and animals; these diseases are much more common than most people realize (58% of all human diseases are also zoonotic). Some zoonotic diseases are reportable disease, which means that doctors, emergency rooms, and hospitals must report cases to state and federal health agencies. The CDC keeps track of how many people (human cases) have sought medical attention for reportable zoonotic diseases. The last annual record was 2015 (CDC 2016). Based on these CDC data, Adams et al. (2016, 2017) and (Curren et al. 2018) reported that 69,661 people sought medical attention for a zoonotic disease, and 376 people died (including both confirmed and probable diseases; Tables 1 and 4). These numbers are conservative because many sick people do not seek medical attention, especially if their symptoms are mild. I also have not included zoonotic diseases that are primarily spread from

one person to another, although a wild animal could have been the original source of the epidemic (e.g., avian flu, dengue). Also excluded from my study are zoonotic diseases that are not reportable, such as histoplasmosis. There are little data on the frequency of non-reportable diseases, but a half million people in the United States are believed to be infected by the histoplasmosis pathogen (*Histoplasma capsulatum*) annually, with most being asymptomatic or only having cold-like symptoms (Conover and Vail 2014).

Cumulative effects

I found that each year, >47,000 people in the United States sought medical attention after being attacked or bitten by wildlife. Most attacks were by snakes, birds, rodents, and raccoons. About 8 people lost their lives annually from these events, with most fatalities resulting from snakebites. In comparison, attacks on humans by large predators were rare. Injuries from wildlife–vehicle collisions resulted in >59,000 human injuries and >440 human fatalities, while wildlife–aircraft collisions added 16 more human injuries and 10 more deaths. I found that >68,000 people each year sought medical assistance for a zoonotic disease, and 243 of these cases were fatal. When these are added to injuries and fatalities from bites, attacks, and wildlife collisions, >174,000 people were injured and >700 were killed by wildlife annually. These figures are conservative because they do not include people who did not seek medical attention or were stricken with a zoonotic disease that was also contagious (e.g., salmonella) or by a disease that the CDC failed to track.

Discussion

I found that attacks by alligators, cougars, polar bears, grizzly bears, black bears, and coyotes have been increasing in recent decades in North America. Although these predators are diverse and live in different parts of the continent, the same factors are responsible for their recent increase in their attacks on humans. All of the predator populations have been rebounding since the early part of the twentieth century when humans poisoned and shot large predators. These animals, which currently enjoy either complete or partial legal protection, certainly have less reason to fear humans than they did previously. Fear of humans have deterred predator attacks in the past but less so today.

Some human-habituated predators moved into urban areas, where they often interact with humans. Concomitantly, human populations have increased, and people are spending more time in remote areas frequented by these large animals. The result is that there is much more contact between these animals and humans, and occasionally these contacts have tragic consequences (Conover 2008). For instance, a tourist who visits the backcountry is 38 and 84 times more likely to be injured by a bear than a normal tourist in Yellowstone National Park and Glacier National Park, respectively (Herrero and Fleck 1989). Today, many people no longer have a healthy fear of dangerous animals and engage in activities that put them in harm's way. This naivety also contributes to the increased frequency of people being injured by wildlife. For example, people approach within a few meters of a bison in Yellowstone National Park, feed alligators in their backyards, and pick up venomous snakes so they can get a closer look.

Natural resource agencies spend time and money promoting visitation and making sure that citizens have a positive opinion of the agencies and the wildlife they manage. People are less likely to visit places where they think they are at risk; fearful people also may develop an adverse opinion of predators and wildlife. Any wildlife attack on a person will attract much attention in the news media, and stories in the media are often designed to elicit empathy for the victim (Stafford et al. 2018). Hence, a single wildlife attack on a person can undo all that was gained by a well-funded publicity campaign by a natural resource agency. Our natural resources, parks, and wilderness areas are dependent upon public support for their existence. That support wanes when people become fearful of wildlife.

Management implications

The number of human injuries, illnesses, and deaths do not mean that wildlife populations are too high or should be reduced because the benefits of wildlife far outweigh the problems they cause (Conover 2011). These incidents provide wildlife biologists an opportunity

to save lives and reduce human suffering. Biologists can teach dangerous animals to fear humans and educate humans to recognize and avoid dangerous situations involving wildlife. Methods to reduce DVCs include modifying the habitat along the roadway to make it less attractive to deer, developing methods that allow deer to cross the road safely, and/or erecting deer-proof fences to keep deer off roads. Motorists can learn that deer rarely travel alone, and that it is deer that they do not see that will likely collide with their vehicle. People can take steps to protect themselves from zoonotic diseases.

One example of progress in reducing human injuries and fatalities from wildlife interactions is the reduction in the number of bird–aircraft collisions over the last decade because of a program implemented jointly by the U.S. Federal Aviation Agency and U.S. Wildlife Services. Wildlife biologists are now stationed at all commercial airports in the United States so that the biologists and airport employees can manage airports to keep away birds and other wildlife. We need many other similar programs to address other problems caused by wildlife.

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Wildlife Tourism: a strategic destination analysis



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FOREWORD

Tourism is widely considered to be the world's largest business enterprise, involving tens of millions of employees and hundreds of millions of customers. Recent estimates suggest that as many as 700 million international trips are taken each year, and domestic tourism may well be an order of magnitude larger than that. Quite simply, people really do like to travel. And while many travel to visit offspring, grandparents, in-laws, or friends, many others travel to visit exotic places where wildlife can stimulate them with new experiences, impressions, and emotions.

Wildlife tourism is a specialised, yet supremely important, aspect of the tourism phenomenon. When thinking about why people like to see wildlife, it is perhaps helpful to take an historical perspective. After all, only one or two generations ago most of our parents and grandparents saw many wild animals virtually every day, and even more domesticated ones. Just 100 years ago, our planet had only about a quarter as many people as it has today, and large cities were few and far between. Wildlife was ubiquitous in the countryside, with flocks of birds so dense they darkened the sky, teeming herds of antelope migrating across the savannas, and schools of fish so thick that in some places the sea seemed solid with life.

Today, the vision of bountiful nature is seen mostly on television, and electronics has become the standard medium for many people to 'experience' the world's wildlife resources. This exposes people to images of the world's biodiversity in ways that were impossible a generation ago, though at some cost of authenticity. In former times, people often were intimately familiar with their local species of wildlife, and aware only dimly (if at all) of the strange beasts that occupied other parts of the world. Today, people may seldom see a wild animal other than commensal species like pigeons and sparrows, yet may be intimately familiar with the lifestyles of koalas, great white sharks, tigers, giant pandas, flamingos, giant otters, migrating caribou, and on and on. Though essentially out of touch with nature in any physical sense, people may be more connected mentally than ever before to at least some aspects of wildlife. Tourism to places where animals live and can be seen behaving as they always have may offer an important opportunity for bringing virtual reality closer to the reality as our ancestors experienced it. Once a person has seen a species in the wild, watching more detailed representations on the television or at the cinema, even in cartoon form, takes on quite a different meaning.

The challenges of wildlife tourism are even more important because half of the world's population now lives in cities, and their relationship with the wild remains distant, even almost mythical. But wildlife tourism provides urban people a chance to get back in touch with their own wild nature, feeling an atavistic thrill when a cheetah streaks across the Serengeti Plain in hot pursuit of a fleeing wildebeest, or scuba diving among a school of barracuda in the coral reefs off the coast of Sulawesi, or casting for trout in a free-flowing mountain stream in the Rockies, or watching flocks of colourful parrots taking wing above the Amazon rainforest. While most urban dwellers may not be very interested in returning to a life without the modern conveniences of refrigeration, electricity, and virtually unlimited amounts of information, many of them are voting with their time and money for at least a temporary return to nature, and visiting the world's last remaining wild areas to enjoy wildlife tourism. It is no coincidence that, as the world's population has doubled over the past 40 years or so, the area of wildlife habitat given legal protection has almost

tripled, and now amounts to nearly 12% of the land surface of our planet. Many, even most, of these protected areas are designed especially for appealing to tourists, both domestic and foreign. Indeed, a convincing argument can be made that wildlife tourism has been an essential stimulus for encouraging governments to take the measures necessary for conserving the world's biodiversity.

What is more, wildlife tourism is providing some significant economic opportunities for landowners who would like to retain wild animals on their land. Private nature reserves are providing useful complements to government-protected areas in many parts of the world. In many other cases, establishing protected areas for wildlife tourism is bringing fundamental changes to the surrounding lands, increasing the proportion of employment in the service and retail sectors while significantly reducing the exploitation of natural resources for consumptive uses. Such economic changes do not always come about entirely smoothly, but it has been clearly demonstrated in many parts of the world that recreation-related employment can be more than five times greater than employment in resource exploitation in the same territory, and gross economic benefits are often more than ten times greater.

All of this has been a rather long-winded way of emphasising how important is the topic of wildlife tourism, both as a phenomenon in its own right, and as a means of demonstrating to governments that we the people want our wildlife heritage to continue to prosper. We value gorillas, pandas, rhinos and elephants both for their own right to exist and so that we, too, may some day hope to have the unforgettable experience of being charged by a bull elephant, or walking quietly among a group of resting gorillas, or bringing down a ring-necked pheasant flushed by a spaniel at point.

This book provides an invaluable primary reference for anyone with a serious interest in wildlife tourism – whether from a conservation or tourism perspective. Bringing together research from a wide range of disciplines, it provides the first detailed compilation and synthesis of wildlife tourism issues. Building on the concept of Triple Bottom Line sustainability, it helps us to understand how we might better use this emerging industry to nourish a continuing intimate relationship between people and the rest of nature, even as some of us isolate ourselves in concrete jungles during the times we are not being wildlife tourists.

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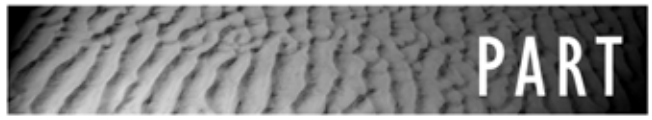


PART ONE

the wildlife tourism industry

Chapter 1

Wildlife Tourism: An Introduction

Karen Higginbottom

Wildlife tourism has been heralded as a way to secure sustainable economic benefits while supporting wildlife conservation and local communities (e.g. Shackley 1996, Fennell and Weaver 1997, Ashley and Roe 1998, Manfredo 2002). But how well is it achieving this, and what needs to be done to secure this vision? This book explores the impacts of wildlife tourism, both positive and negative, and provides directions for its design, planning and management. In this introductory chapter, we define and classify wildlife tourism, provide a framework for its planning and management and explain why wildlife tourism is important. The last part of the chapter provides a rationale and outline of the book.

Tourism that is based on visitors interacting with wild animals is attracting increasing interest from governments, the tourism industry and researchers. The types of experiences are diverse. They include scuba diving on a coral reef, going on a wildlife safari in Africa, whale watching from a boat or land, bird-watching either independently or with a commercial guide, spotting animals while walking in a national park, staying at an ecoresort with neighbouring wildlife, visiting a zoo or wildlife sanctuary, big game fishing and trophy hunting. All of these tourism activities, and many more, feature wild animals as the major or a significant part of the experience. And increasingly, such experiences are becoming part of organised tourism, widely considered a growth industry and contributing substantially to the economy of many countries (WTTC 2000), despite recent setbacks to international travel.

While the only feature shared by all wildlife tourism products or experiences is their inclusion of a wildlife element, labelling and discussion of wildlife tourism, as a distinct class of tourism, is becoming increasingly common. In recent years, a number of organisations and initiatives have been established to focus particularly on viewing of free-ranging wildlife, such as the National Watchable Wildlife Program and state wildlife viewing programs in the USA (Pierce and Manfredo 1997, USDA Forest Service 2003), a wildlife tourism initiative by the Scottish 'Tourism and the Environment Forum' and formation of Wildlife Tourism Australia (see Chapter 13 for details). Wildlife viewing handbooks for practitioners (especially Richie Oberbillig 2000) and guidebooks and videos for recreationists and tourists are appearing (e.g. Duda 1995; Case and Associates 1995; Bennett et al. 2000 and 31 USA state wildlife viewing guides available through Watchable Wildlife, Inc. 2003). Several universities now include subjects on wildlife tourism in their curricula (e.g. University of Western Sydney and James Cook University, Australia and Central Lakes College, USA). Businesses have been established to supply goods to support wildlife watching (e.g. Wildlife Watching Supplies 2003).

This focus on wildlife tourism seems to reflect three factors. First, there is increased interest from wildlife management professionals and non-government wildlife organisations in synergies that can be gained between wildlife conservation and tourism involving wildlife (Chapter 6). Second, wild animals are increasingly used

by marketers in some countries (e.g. Scotland: birds and marine mammals, India: tigers; China: giant pandas) as flagships for promoting tourism in general or nature-based tourism. This is associated with a third factor: that for many tourists wild animals are of particular interest compared with opther elements of the natural environment. We do not argue for promotion of wildlife tourism as a distinct entity, as whether this is worthwhile will depend on the goals of the person or organisation involved. However there is a wide range of issues and stakeholders associated particularly with tourism based on wildlife that merits systematic and critical evaluation, as will be seen in subsequent chapters.

What is wildlife tourism?

Wildlife tourism is tourism based on encounters with non-domesticated (non-human) animals. These encounters can occur in either the animals' natural environment or in captivity. It includes activities historically classified as 'non-consumptive', such as viewing, photography and feeding, as well as those that involve killing or capturing animals, particularly hunting (in the terrestrial environment) and recreational fishing (in the aquatic environment). Wildlife tourism can entail: attractions at fixed sites, tours, experiences available in association with tourist accommodation, or it can occur as unguided encounters by independent travellers. Further explanations of key terms used in this book are given in Box 1.1.

Box 1.1: Wildlife tourism terminology

'Tourism' is the sum of government and private sector activities that shape and serve the needs and manage the consequences of holiday, business and other travel (Pearce et al. 1998, p.xvi.). A **'tourist'** is a person who travels 40km or more away from their home for a period of at least one night, for any reason other than paid employment (Harris and Howard 1996, p.88). In some cases in this book, we use the more general term **'visitor'** to mean a person who undertakes temporary travel outside their home to another location for any purpose other than engaging in paid employment in the location visited (Harris and Howard 1996, p. 162).

We restrict our definition of **'wildlife'** to fauna (animals), to coincide with general use of the term by the tourism industry and public. The term **'animal'** is defined in the biological sense to mean any member of the Kingdom Animalia (except humans). It thus includes not only land-dwelling vertebrates such as mammals, birds and lizards, but also aquatic vertebrates that usually live in the sea or inland waters, such as platypus, fish and turtles. It also includes invertebrates such as glow-worms, butterflies, corals and starfish. Wildlife is not restricted to animals that are native to the country in question (such as kangaroos and emus in Australia) but also includes exotic animals, whether held in captivity, or introduced into the natural environment either deliberately or accidentally (such as feral pigs and camels in Australia). The term **'non-domesticated'** is preferred to **'wild'** because it is unclear whether the latter term applies to the species or its setting (e.g. a tiger in a zoo is a non-domesticated species, but some might argue it is no longer wild).

'Wildlife tourism' can be applied at a number of hierarchical scales. Its application is complicated by the fact that many tourism experiences and products feature wildlife as only one component of a travel package. At the lowest hierarchical level, wildlife tourism is that component of a tourism experience or product that is based on wildlife. At the next level, it can be applied to tourism products. For convenience in this book, a whale watching tour and an ecotour that includes wildlife are both considered wildlife tourism products. It can also be applied to businesses that offer a wildlife tourism product. Thus, a zoo and a farm-stay business

that includes viewing of wild animals (among other experiences) are both considered wildlife tourism businesses in this book. At the highest level, some places, such as the Galapagos Islands and Kenya can reasonably be described as wildlife tourism destinations.

As a tourism product category (the sense in which we use the term in the majority of this book), wildlife tourism overlaps with other classes of tourism, particularly nature-based tourism, special interest tourism and ecotourism (see Higginbottom et al. 2001 for a diagram illustrating this). The extent of this overlap depends on exactly how these terms are defined. We consider that most wildlife tourism is a subset of nature-based tourism, since animals are a subset of nature, although zoos and other attractions where wildlife are kept in captivity are not seen by some other authors as nature-based tourism. Wildlife tourism can be considered a form of ecotourism when it occurs within the context of nature-based activities that provides environmental interpretation and adopts environmentally responsible practices. In cases where a tourist travels to a particular destination primarily for the purpose of having a wildlife experience, then wildlife tourism can be seen as a form of special interest tourism (Hall and Weiler 1992).

Classification of wildlife tourism

Wildlife tourism includes a very diverse set of experiences, and classifying different forms or attributes of these experiences can be useful for a variety of purposes. In this book, we distinguish between (and discuss separately in the first part of the book) the following main forms of wildlife tourism:

- Wildlife-watching tourism (viewing or otherwise interacting with free-ranging animals)
- Captive-wildlife tourism (viewing animals in man-made confinement; principally zoos, wildlife parks, animal sanctuaries and aquaria; also includes circuses and shows by mobile wildlife exhibitors)
- Hunting tourism
- Fishing tourism

We distinguish between these forms because each is associated with somewhat distinct types of suppliers, organisational networks, environmental impacts, host community issues, stakeholders, markets and bodies of literature. We do, however, link our discussion of hunting and fishing, because although the suppliers, organisational structures and (to some extent) markets are different, the historical distinction has been somewhat artificial (due to different public perceptions of terrestrial and aquatic vertebrates) and we believe there is value in linking them together in order to demonstrate commonalities.

From an economic point of view, each of these forms of wildlife tourism can be considered a ‘product-market’, which is a group of products with similar patterns of benefits for a group of customers (Rosa et al. 1999). The customers associated with different product-markets are likely to have different objectives and motives in relation to wildlife tourism. Sub-division into further product-markets within each of these forms may also be useful for some purposes.

It is however important to recognise that the distinctions between all these forms have become less clearly defined in recent times. Wildlife tourism product offerings change to follow tastes and trends in markets and suppliers, and also with changes in wildlife management practices. A large fenced nature reserve, established to conserve natural habitat, such as those found commonly in southern Africa, would typically be

considered as having free-ranging animals (providing wildlife-watching tourism). It would be considered as very distinct from an open-range zoo. Yet these days the latter might use existing natural vegetation or revegetate large areas to closely resemble natural habitats, and might be almost as large in area. There is in fact a continuum from circumstances where animals are living with virtually no human influence, through varying degrees of provisioning (where free-ranging animals are provided with resources by tourists or tourism operators) to confinement in small enclosures or cages. Similarly, the distinction between wildlife watching and hunting is in some cases smaller than some would suppose, as exemplified by the increasing popularity of catch-and-release fishing (see Chapter 4). A further limitation on this classification system is that the extent of overlap between markets for these different forms is not clear, but probably considerable (e.g. see Duda et al. 1998). The criteria for classifying forms of wildlife tourism will need to be continually reassessed in relation to such changes. The most appropriate type of classification depends on the purpose of classification, and thus depends on the person or organisation doing the classifying (see Box 1.2).

Box 1.2: Scope and classification of wildlife tourism

The key variables that have most commonly been used to classify forms of wildlife tourism in the literature are:

1. Consumptive vs non-consumptive. Consumptive wildlife tourism involves animals being deliberately killed or removed, or having any of their body parts utilised (Freese 1998) e.g. hunting, fishing, bull fighting and other blood sports. Since whether or not tourism is called 'consumptive' may seem to pre-empt whether or not it leads to negative impacts on the wildlife, these terms may be misleading. Poorly managed wildlife watching can cause serious negative impacts on wildlife, while well-managed hunting or fishing can be ecologically sustainable. Therefore we generally avoid use of these terms.

2. Captive - free (range) continuum, reflecting the degree of confinement of animals.

3. Wildlife-dependent vs wildlife-independent. Wildlife-dependent wildlife tourism occurs when it is the tourists' deliberate intention to view wildlife, whereas wildlife-independent wildlife tourism relates to tourists who travel without the specific intention of experiencing wildlife, but consider their wildlife encounter adds value to their recreational experience. An alternative terminology sometimes presented for this is **primary vs secondary wildlife watching**.

To elaborate on the above classification, most types of wildlife tourism that are commonly recognised or promoted as distinct brands (e.g. whale watching tours, night spotlighting tours, zoos, trophy hunting, working conservation holiday) can be distinguished from each other by a unique combination of values of the variables listed below (modified from Higginbottom et al. 2001). Those marked with an asterisk are the ones that are used as the defining features of the four forms of wildlife tourism identified in the text (wildlife-watching tourism, captive-wildlife tourism, hunting tourism and fishing tourism).

1. Level of confinement (captive* - free-ranging continuum)

2. Environment (or simulated environment) where interaction occurs (land, coastal, marine not in water, marine underwater, freshwater not in water, freshwater underwater)

3. Principle type of encounter (view natural or simulated natural activities, view performing animals, view non-living animals, feed animals, handle animals, kill or capture animals*, research or conservation work, view and learn about wildlife farm production, indirect, no 'real' animals)

4. Degree of emphasis of tourism experience on wildlife (continuum from a minor component to the emphasis of the whole experience)
5. Dispersion (fixed site attraction, dispersed activity, mobile attraction)
6. Type and range of animal species (e.g. in free-ranging settings: whatever species are encountered, fish*, mammals, birds, whales, seals; in wildlife farms: ostriches, alpacas, crocodiles)
7. Type of supplier: none (independent travellers), private tourism operator, non-profit organisation, government nature conservation or wildlife agency, local council, educational institution.

Further dissection of these and certain additional variables can be used to characterise wildlife tourism activities in ways that correspond with appropriate design features and approaches to marketing and/or management (Higginbottom et al. 2001).

A framework for planning and managing wildlife tourism

Goals for wildlife tourism: sustainability and maximising benefits

The goal of sustainable development is now widely accepted and adopted by governments and business sectors, and is commonly defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development 1987). Sustainability has been adopted as the dominant paradigm for the tourism industry (see especially WTO/WTTC/Earth Council 1995), and is widely interpreted as 'tourism which is developed and maintained in an area in such a manner and at such a scale that it remains viable over an indefinite period and does not degrade or alter the environment (human and physical) in which it exists to such a degree that it prohibits the successful development and well being of other activities and processes' (Butler 1993, p29). It thus requires simultaneous consideration of impacts of tourism on the natural environment, host (human) communities, the tourism industry and tourists. Thus contemporary tourism planning seeks to develop sustainable tourism destinations. More recently, the concept of Triple Bottom Line sustainability (Elkington 1997), focusing on economic prosperity, environmental quality and social justice, has become widely adopted by major business players in the private sector and government (see Chapter 10). Achieving sustainability also requires that wildlife tourism development is integrated into national, regional and local strategic planning frameworks.

While practical application of the concept of sustainability is problematic (see Weaver and Lawton 1999), the broad concept is helpful in guiding policy and planning, and is taken as a starting point for this book. The application of sustainability to each of the above areas is explored further in Chapters 5-10.

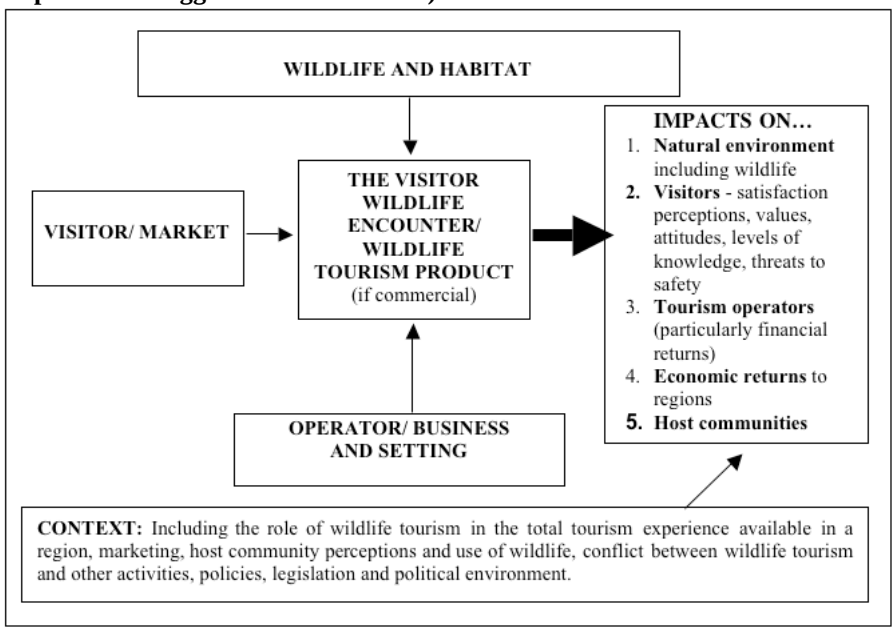
An alternative way of conceptualising sustainability is to say that it is about minimising long-term costs to the human or physical environment. Moving beyond the goal of sustainability is the idea that wildlife tourism should be planned and managed to maximise net benefits to society or stakeholders (Manfredo and Driver 2002). A certain level of benefits (in relation to costs) might be needed to ensure sustainability, but additional benefits are possible beyond this. Thus, wildlife tourism might, in principle, bring psychological benefits to visitors beyond those needed to maintain customer demand. It might bring financial benefits to individual businesses beyond those needed to simply sustain businesses. It might lead to social benefits to host

communities that improve on their perceived quality of life prior to tourism. Finally, wildlife tourism might provide economic benefits to host communities or countries that exceed those of alternative sustainable resource uses. Of particular interest to conservationists, it is argued that wildlife tourism can bring benefits to wildlife and habitats that might help redress conservation problems caused by factors other than tourism.

Elements of the wildlife tourism system

The visitor-wildlife encounter comprises the core of a wildlife tourism product (if a commercial operator is involved) or of a wildlife tourism experience (if not). As shown in Figure 1.1, it is the result of the interaction of elements relating to the natural resource base (wildlife and associated habitat), the visitor, the operator or business, and the setting. Encounters also lead to consequences for the visitor, the natural resource base, the economy (from the level of the individual business to that of the country as a whole), and for the host community. The consequences for the natural environment and for host communities can be positive, neutral or negative (Budowski, 1976; Ashley and Roe, 1998). All these elements depend, in turn, on the wider context in which the experience occurs. There will often be interdependencies between and within these elements, which are not shown in this diagram for the purpose of simplification.

Figure 1.1: Interactions between components of the wildlife tourism experience (adapted from Higginbottom et al. 2001).



Thus in order to explain the various outcomes of wildlife tourism, and to manage it sustainably, we need to consider all of these elements in an integrated way. Stakeholders or researchers from different disciplines will inevitably attribute different emphases and levels of detail to different elements of the system, but sustainability still requires consideration of all elements and their interactions. This conceptualisation also helps us to identify the major stakeholders involved in wildlife

tourism (Table 1.1). Achieving sustainability or maximising benefits can thus alternatively be seen as finding ways to jointly achieve the goals of these major stakeholders. In this book, we explore all these perspectives, and consider in the concluding chapter how they can best be reconciled.

It is recognised that this table is a simplification, and that within each of these stakeholder groups, there will be a diversity of primary goals among different individuals or organisations. In particular, many wildlife tourism operators and a growing number of industry organisations consider long-term economic sustainability, high quality experiences and even ecological sustainability to be primary goals.

Table 1.1: Primary goals of major wildlife tourism stakeholders.

Stakeholder	Expected primary goals
Visitors	Access to affordable, high quality wildlife tourism experiences.
Tourism industry, including private and public sector operators, the travel trade and industry associations	Growth of wildlife tourism. Maximise short-term profits to individual operators and members of travel trade.
Government agencies concerned with tourism planning and promotion	Economically, socially and ecologically sustainable growth of wildlife tourism. High quality operators and experiences.
Host communities	Maximise profits to local area. Minimise negative social consequences of tourism. Minimise disruption of local uses of wildlife.
Environmental managers, particularly government conservation agencies	Ecological sustainability of tourism activities. Satisfy public recreation goals. Use tourism to support conservation goals.
Non-government organisations concerned with animal welfare and conservation	Minimise threats to wildlife conservation and/or welfare. Use tourism to support conservation goals.
Wildlife?	(Generally it is assumed that their interests are reflected among the goals of the latter two stakeholder groups)

Why is wildlife tourism important?

Wildlife tourism is economically important

Although there are no reliable global estimates of the economic impact of wildlife tourism, it is clear that it involves large numbers of participants and generates lots of money. One of the few attempts to estimate global economic impacts has been made by Filion et al. (1994, p.239), who concluded that in 1988, depending on the region, 'wildlife-related tourism appears to account for some 20-40 percent of international tourism' and that it 'accounted for [national] economic impacts ranging from US$47 billion to US$155 billion' (but see a critique of this estimate in Chapter 8). More reliable global estimates of participation are available for certain types of wildlife tourism. An estimated nine million people participated in whale watching in 1998, with total expenditures of US$1,049 million (Hoyt 2000). Recreational scuba diving has been estimated as attracting 14 million annual participants (Shackley 2001), although the extent to which this includes viewing of underwater wildlife is unknown. Tourist submarines and semi-submersible vessels carry over two million passengers and take an estimated US$150 million in revenue annually (Cater and Cater 2000). Zoos seem to attract more participants than any other organised form of wildlife tourism, with an estimated 600 million visitors annually (IUDZG/CBSG 1993), although it is not clear what proportion of these visitors are tourists as opposed to local residents. In addition, millions of people worldwide participate in hunting and fishing tourism (see Chapter 4).

The most detailed recent research to determine the importance of wildlife-related recreation has been in the USA, although these statistics generally do not distinguish tourism from recreation by local residents. The most up-to-date and comprehensive study estimates that during 2001, 66.1 million adults in the United States engaged in wildlife watching (observing, feeding, or photographing non-captive wildlife), 21.8 million of whom travelled at least one mile away from their home for the primary purpose of doing so (U.S. Department of the Interior, Fish and Wildlife Service, US Department of Commerce and U.S. Census Bureau 2002). Tourists (as defined here) would comprise a subset of the latter figure. A total of 37.8 million people were estimated to participate in hunting and/or fishing (distance from home not specified). The study further estimates that wildlife watchers spent a total of US$38.4 billion on their wildlife-related trips, activities and equipment, while people engaged in hunting and/or fishing spent a total of US$70 billion. Thus, although rates of participation in hunting and fishing are lower than for wildlife watching, the total expenditure is much greater. In the USA, birdwatching has been estimated to involve up to 60 million people (Hall and O'Leary 1989) or alternatively 20-35% of the adult population (Adams et al. 1997). Whale watching is estimated to have attracted just over 4.3 million visitors in 1998, with a total expenditure of about US$357 million (Hoyt 2000).

Information on the importance of wildlife tourism outside North America is difficult to obtain, though a few scattered statistics are available (Box 1.3). Some estimates are also available for individual species or wildlife tourism operations (Box 1.4).

Box 1.3: Sample of estimates of participation and economic impacts of wildlife tourism outside North America

- UK: enjoyment of wildlife a priority for 90% of holidaymakers (Roe *et al.* 1997); more than half of the population visited a zoo, wildlife or safari park over the previous five years (Shackley 1996).
- Australia: Wildlife a prime attraction for 32% of international tourists (Risk & Policy Analysts Ltd 1996 cited in Roe et al. 1997). 18.4% of international visitors influenced in their decision to visit Australia by the opportunity 'to experience native animals' and 67.5% of international visitors said that they wanted to see 'animals' during their visit (Fredline and Faulkner 2001).
- Galapagos Islands (a tourist destination based largely on wildlife watching) attract over 60,000 visitors per year and contribute more than US$100 million to the Ecuadorian economy (Charles Darwin Research Station 2001, TIES 2000).
- Kenya: Wildlife a prime attraction for 80% of international tourists (Risk & Policy Analysts Ltd 1996 cited in Roe et al. 1997). Tourism based on viewing of free-ranging wildlife worth US$400 million to the national economy (WTO and UNEP 1992) and considered the basis of the country's tourism industry (Akama and Kieti 2003).
- Zimbabwe: direct revenue earned from hunting safaris by international visitors in 1990 was US$9 million (Heath 1992).
- South Africa: hunting industry worth $US69.3 million annually.
- Tanzania: revenue from hunting license fees about $US4.5 million (more than that raised from park entry fees) (Makombe 1993).

Box 1.4: Sample of estimates of economic impacts of individual wildlife species or wildlife tourism attractions

- Mountain gorillas alone provide annual revenue of US$4 million to Rwanda (Groom et al. 1991).
- Each individual lion in Amboseli National Park worth US$515,000 as a tourist resource over its lifetime (Thresher 1981).
- Economic value of wildlife to international tourism in Australia in the range AUD$1.8 to AUD$3.5 billion per year, and koalas alone worth about AUD$1.1 billion (Hundloe and Hamilton 1997; but see Davis et al. 2001).
- Commercial tours based on the glow-worm population at Springbrook National Park in SE Queensland generated gross revenue of AUD$4 million for a one-year period (C. Baker, University of Queensland, pers. comm., 2003).
- Scottish Seabird Centre makes annual economic contribution of over a million pounds to the local economy (Brock 2002).
- Annual economic impact of five major bird-watching sites in the USA of up to US$40 million (Kerlinger and Brett 1995),
- Each macaw visiting a tourist site in southeastern Peru potentially generates up to US$165,000 in tourist receipts over its lifetime (Munn 1992).

These and other examples illustrate that at least some forms of wildlife tourism are economically important in some parts of the world. The above discussion is however limited to direct expenditure, and a discussion of the full economic impact of wildlife tourism is included in Chapter 8. Wildlife Tourism seems to be particularly important in those countries with a well-developed market for such activities (North America and Europe) and those with exceptional wildlife resources.

Wildlife tourism can contribute to rural economies

Because wildlife is often most abundant far from major urban development, it has been argued that wildlife tourism can provide a much needed boost to depressed economies in rural areas (McCool 1996; Fennell and Weaver 1997, Goodwin et al. 1998). In a few cases, wildlife tourism is a major component of the economy of non-metropolitan areas or towns. For example, the Scottish Seabird Centre (see Box 1.3) is considered to have re-established the local town as a tourist destination, enhanced its image and generated a sense of local pride and ownership (Brock 2002). Polar bear watching is the major economic activity for the town of Churchill in northern Manitoba, Canada. In parts of southern Africa, game viewing has been found to be much more valuable than farming of domestic livestock, and is the major source of income (Muir 1987; Sindiga 1995; Akama 1996). Hunting tourism is an even more important source of income to rural landowners in some areas (Decker et al. 2001; see also Chapter 4). Other examples of the importance of wildlife tourism to rural economies are given in Chapters 6, 7 and 8.

Some forms of wildlife tourism are growing

It is widely considered that wildlife tourism has grown (in terms of number of operators and/or tourists, and by implication in economic value) in recent years and continues to do so (e.g. Ethos Consulting 1991; Shackley 1996; Roe et al. 1997; Manfredo et al. 2002), although the evidence to this effect relates principally to various forms of wildlife watching. This has been documented for relatively new

phenomena such as whale-watching (Hoyt 2000) and tourist submarines (Cater and Cater 2000) and is also thought to be the case for bird-watching (e.g. Cordell and Herbert 2002) and scuba-diving/snorkelling (Davis and Tisdell 1996, Shackley 2001). The number of dedicated wildlife-watching operators appears to have grown over recent years, although a study in Scotland (A&M Training and Development 2002) is one of the few to have documented this quantitatively. A number of American states and Canadian provincial governments, as well as the Scottish government, have identified wildlife watching as an important growth area (see Chapter 13).

However, while past growth in some sub-sectors seems to have occurred, it is important not to generalize for all forms or brands of wildlife tourism (see Chapter 9). In particular, there may have been a small decline in zoo tourism (Chapter 3) and perhaps in hunting tourism (Chapter 4) worldwide in recent years (however these trends apply to participants in general, rather than to the tourism component, for which there is very little information). It is also important not to assume that any past growth will continue into the future (see Chapter 9).

Wildlife tourism can have major impacts (negative or positive) on wildlife and their habitats

As wildlife tourism based on free-ranging animals has apparently grown, so have concerns about threats to wildlife populations and their habitats. A large body of research now exists to show that a wide range of negative impacts of wildlife tourism can and do occur (reviewed in Chapter 5). This concern is exacerbated by the desire of some tourists to see threatened species and to travel to increasingly remote areas. To ensure sustainability of the wildlife resource, appropriate management and monitoring is required (see Chapter 11), and some species and situations may even need to be precluded from tourism altogether.

On the other hand, some wildlife tourism contributes positively to conservation. There has been a progressive recognition that if conservation is to be successful in the long term, it must be promoted both inside and outside protected areas, and must be integrated with the realities of modern economies and meeting people's needs (Shea *et al*. 1997). Governments and major international conservation organisations now widely support the view that well-managed nature-based tourism is one form of land use that can meet these joint goals (a view first clearly articulated by Budowski, 1976). In areas where suitable wildlife exists, development of tourism based on wildlife watching or hunting can provide economic incentives and revenue for conservation of natural habitats and wildlife (Higginbottom et al. 2001). Further, wildlife tourism in some cases provides revenue that helps fund conservation and there is evidence that there is potential for an increase in this form of funding. These and other benefits of wildlife tourism to conservation are discussed further in Chapter 6.

About this book

Since Shackley's (1996) review of wildlife tourism, much research in this field has been conducted. In particular, a recent Australian research program, conducted and largely funded by the Cooperative Research Centre for Sustainable Tourism (www.crctourism.com.au), represents the first major coordinated attempt to bring together a multi-disciplinary team of researchers to address key issues in wildlife tourism. Many of the authors of the present volume were involved in this research program, and these chapters build upon that research.

This volume provides, for the first time, a detailed reference that covers all major forms of wildlife tourism. It draws on research from a range of academic disciplines and is intended for a wide audience including academics and students in the disciplines of tourism and wildlife management, professionals working in government tourism and conservation agencies and members of tourism industry associations. It will also be of interest to motivated nature and wildlife tourism operators and general readers, particularly those with an interest in contemporary wildlife issues. The focus of the book is international, including applications to both more-developed and less-developed countries. Its aim is to provide information, ideas and suggestions to help facilitate Triple Bottom Line sustainability of wildlife tourism, and beyond this, to enhance its net benefits to society (including wildlife).

This book illustrates the need to integrate knowledge of commercial tourism with that relating to the fields of protected-area management, wildlife management and recreation. The recent publication of Manfredo's (2002) *Wildlife viewing: a management handbook* reflects the emergence of wildlife viewing planning and management as a fledgling profession (Pierce and Manfredo 1997), and is an important source of information for parts of this book.

The remainder of this volume consists of three parts. The first provides a descriptive overview of each of the major forms of wildlife tourism. It also discusses key issues impacting on sustainability issues for each of these, and proposes broad future directions for these forms. Chapter 2 deals with wildlife-watching tourism, in both terrestrial and marine environments. Chapter 3 reviews zoos, the component of captive-wildlife tourism that attracts by far the greatest number of visitors (very little is known of other aspects of captive-wildlife tourism). Chapter 4 jointly reviews hunting and fishing tourism.

The second part of the book discusses the role of wildlife (Chapters 5 and 6), host communities (Chapter 7) and economics (Chapter 8) in wildlife tourism, with particular emphasis on the impacts of wildlife tourism on each of these elements of the wildlife tourism system. The third part deals principally with planning and management of wildlife tourism. It discusses how to plan and manage individual businesses (Chapter 10) and how to mitigate impacts of wildlife tourism on wildlife (Chapter 11). Current knowledge about the market for wildlife tourism is reviewed in the context of implications for planning and management of wildlife tourism (Chapter 9). Interpretation is discussed in relation to its role in visitor enjoyment and influencing visitors in relation to conservation (Chapter 12). The concluding chapter draws together information from the rest of the book and introduces some integrating concepts and ideas to point to the way forward for wildlife tourism that will bring sustainable benefits to the tourism industry, consumers, host communities and wildlife.

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Chapter 2

Wildlife Watching

Peter Valentine and Alastair Birtles

Introduction

This chapter is concerned with wildlife tourism that is focused on watching free-ranging animals in their natural habitats. It begins with a review of wildlife watching and classifications used to describe the activities and attractions involved. A central element is a global assessment of critical natural resources needed for wildlife watching including their geographical distribution. The chapter also provides a number of examples of different types of wildlife watching to assist the reader in appreciating some of the more experiential dimensions of this form of tourism. Several key aspects of sustainability are discussed using an example from marine wildlife watching.

Humans often have extremely intense and deeply personal experiences through wildlife watching and this may lead to outcomes that are extraordinary in their impacts on people's lives. At least some, if not most, forms of wildlife-watching tourism seek to provide just such an experience for their clients. There are many examples of intense encounters with wildlife in the literature, and the following account is from a famous scientist, co-author of the theory of evolution through natural selection. In this description one can sense the depth of emotion and excitement generated by his first encounter with a birdwing butterfly in the wild.

> 'I found it to be as I had expected, a perfectly new and most magnificent species, and one of the most gorgeously-coloured butterflies in the world. … more than 7 inches across the wings, which are velvety black and fiery orange …. The beauty and brilliancy of this insect are indescribable…. On taking it out of my net and opening the glorious wings, my heart began to beat violently, the blood rushed to my head, and I felt much more like fainting than I have done when in apprehension of immediate death. I had a headache the rest of the day so great was the excitement produced by what will appear to most people a very inadequate cause.' Alfred Russel Wallace, *The Malay Archipelago*, Chapter xxiv p257-258 [1962 reprint of revised 1869 edition].

Description and classification of wildlife watching

Although a dichotomous distinction is often made between free-ranging and captive animals there is in fact a continuous spectrum of wildlife-watching experiences (see Chapter 1). Other variations among different forms of wildlife watching may relate to one or more of the following: primary objective, level of interpretation provided by operator or site manager, type of transport or platform, seasonal or diurnal variations, concentration or dispersion of the wildlife, managerial and social settings, degree of wilderness, type of environment and price variations (Higginbottom et al. 2001).

Tourism experiences involving wildlife vary greatly in the emphasis or intensity of encounters. In some cases the wildlife forms the basis and entirety of the tour package, as in dedicated birdwatching or whale-watching trips. In some, while wildlife may provide a focus and incentive, there are other attributes of significance within the trip. For example, some wildlife safaris in east Africa include cultural elements. In much

landscape-based tourism the wildlife may be part of the backdrop and occupy an incidental (but sometimes significant) element of the experience as, for example, free-ranging kangaroos seen from a regional tour bus in Australia.

The type of wildlife, environmental variations and design or context of the wildlife experience provide further planning and management divisions of wildlife watching. The actual animals that form the basis of wildlife watching include butterflies in Mexico and California (Monarch over-wintering sites), through migrating birds in most continents – from hummingbirds and hawks to waders – to spectacular aggregations (flamingos and cranes). The 'big five' mammals in east Africa (elephant, rhinoceros, buffalo, lion and leopard) are well known, but numerous large and appealing species throughout the world are also important for wildlife watching. Most countries have actual or potential target species for wildlife watching. Aggregations of mammals from whales to wildebeest attract significant interest from tour operators and some of these are associated with life-cycle activities such as breeding and migrating. A key element in the better-known species is predictability, which enables a tourism venture to be developed, enhanced and offered to the visitor. Environmental distinctions include broad categories of marine, terrestrial, coastal areas and specific habitat types (e.g. wetlands, rivers, rainforests, savannah, mountains, deserts, coral reefs, pelagic areas). Although it is true that some environments may be more species-rich than others, there are wildlife watching opportunities in almost every type of natural environment.

The design or context of the wildlife experience is quite varied (Higginbottom and Buckley, 2003) and includes:

- Unguided encounters with wildlife in natural areas (e.g. National Parks) with no direct involvement of commercial tourism operators. This is a common form of wildlife watching in the USA, Canada, Australia and parts of Europe.
- Specialised wildlife tours (e.g. bird-watching tours, safari tours, whale-watching tours).
- Managed locational attractions featuring a natural aggregation of wildlife (e.g. penguin breeding colonies, fish aggregation areas, migratory pathways for birds and mammals including waders and whales, overwintering insect aggregations, glow-worms in caves).
- Nature-based tours that include wildlife (e.g. National Park tour with game drive; regional protected area tour, day trip to specific habitat areas (e.g. rainforest) with wildlife component).
- Research, conservation or education tours involving wildlife, offered by organisations whose primary role is not tourism (e.g. university groups, Earthwatch, conservation NGOs, some government and NGO alliances).
- Sightseeing tours that include some element of incidental wildlife-watching.
- Accommodation or other tourism facilities that feature surrounding wildlife (e.g. resorts, farm-stays).

Valentine (1992) also provides a set of dimensions that apply to wildlife watching, divided into broad categories of experience, style and location. Each of these dimensions is useful for description, analysis and management of wildlife-watching tourism. There remains a number of unknowns, including the precise role of individual species in attracting tourists.

Importance of Wildlife Watching

The US Fish and Wildlife Service has been conducting national surveys of wildlife-related activities and expenditures for many years and provides an excellent indicator of the significance of wildlife for recreation within a single country. Most recently the publication of the final results from the 2001 study of economic impacts of wildlife watching based on a study of 15,000 wildlife watchers across the USA provides further evidence of its importance in that country (Caudill, 2003). The study excluded visits to captive wildlife sites and included data on activity close to home and further afield. Expenditure levels were very large and indicate the generally high level of technical equipment used. In one year wildlife watchers alone spent US$2.6 billion on cameras and other photographic gear and spent US$507 million on binoculars and spotting scopes. In 2001 more than 66 million adults participated in feeding, observing, and photographing wildlife and spent US$38.4 billion, an increase over the previous study five years earlier (Caudhill and Laughland, 1998). As Caudill (2003) notes, rural areas attract thousands of wildlife watchers each year, generating millions of dollars. Across the USA wildlife watching expenditures in 2001 generated US$95.8 billion in total industry output including US$6.1 billion state and federal taxes as well as over 1 million jobs.

Measures of simple participation and estimates of expenditure may be supplemented by studies that seek to understand the significance of wildlife to human communities (Kellert, 1996). Such studies reveal that humans have favourite species (those they might fight hard to protect) and less-favoured species. Not surprisingly mammals and birds are more favoured than reptiles and insects although there are regional variations. Outside North America information on the importance of wildlife tourism is difficult to obtain, though a few scattered statistics are available (see Chapter 1).

Although the available information is limited in terms of geographical coverage and accuracy, the evidence points to wildlife watching being economically important on a global scale (Higginbottom and Buckley, 2003). However, as Higginbottom et al. (2001) point out, caution is required in drawing conclusions about the level of demand. Overestimating demand can lead to undesirable outcomes flowing from unhealthy competition between operators and inappropriate investment of scarce resources. Underestimating demand can also lead to management problems, with infrastructure and resources lagging behind requirements. Apart from the broad data on participation, sustainable management practices require much more detailed information on visitors, notably the kinds of experiences sought, levels of specialisation and particular settings desired. These form the basis for visitor-management programs, themselves essential components of managing tourism in protected areas. McCool (1996) examines links between wildlife watching, protected areas and sustainability. This field is of crucial importance to protected area managers and IUCN has recently prepared best practice guidelines to ensure sustainable tourism in protected areas (Eagles, McCool and Haynes, 2002).

Nevertheless, there are major gaps in our understanding of the nature of wildlife-watching demand. Higginbottom et al. (2001) note that very little is known about:

- the levels of demand for watching particular species;
- the levels of demand for different types of wildlife encounters such as free-range versus captive and remote versus easily accessible;
- the characteristics of tourists who seek wildlife encounters;

- the range of different types of wildlife tourism markets; and
- whether existing growth reflects an increasing interest in wildlife or the filling of latent demand.

Moscardo and Saltzer provide a review of current knowledge about some of these elements (see Chapter 9). They also point out that the most desirable features of wildlife tourism included seeing rare and distinctive wildlife behaving naturally in their natural environment. Box 2.1 provides an example that fits most of the listed desirable features. It also serves as an example of a specialised form of wildlife watching available to non-specialist visitors. The new tourism also brings positive outcomes to local communities - a key feature of sustainability.

Box 2.1: An example of a wildlife watching experience in a National Park

Tiger watching in India

'It is still dark when I walk from the forest rest house to the elephant loading platform and join the mahout who will be my driver. He speaks no English, and I no Hindi, but we greet each other, he with a welcoming smile and I with excited grin. I am in Kanha National Park in the heart of India and Dr M.K. Ranjitsinh, the Director of National Parks in Madhya Pradesh, has arranged for me to learn more about the tiger management program. This early morning start is to locate a suitable tiger for the daily tourist tiger-watching activity. Elephants were previously used in the logging industry but are now a cornerstone for park management, providing tiger monitoring duties and, critically, transport for tourists to see wildlife, especially tigers. Kanha National Park is India's oldest and its 100 000 ha provide a home for up to 100 adult tigers and the game on which they feed (mainly Chital). The tourism industry is predominantly national but provides income and work for the former forest workers and their elephants.

The elephant negotiates trails throughout the Sal forest (*Shorea robusta*) leaving minimal impacts with its huge padded feet and from its back we have an excellent view. Each tiger is known to staff by its distinctive face pattern and pug mark and this morning it takes only an hour or so to find one at rest after a kill. We approach cautiously and it seems to me that the closer we get to this large male tiger, the smaller the elephant we are riding. There is mutual respect between these two great animals here in their home ground. From long experience the mahout knows that he must keep the elephant at least 5 metres from the tiger. I consider 20 or 30 metres much more prudent and notice that all the hairs on my body are on edge. Nothing I had read or seen before prepared me for this amazing experience. The first thought was that the tiger is much, much bigger than I had imagined. The beauty of the tiger's huge head frames a pair of wide-set almost glowing eyes that draw my attention. I sense intelligence and power and only the relaxed attitude of the tiger calms my fear. When the tiger rises and strolls a few metres through the undergrowth the striped patterns cause it to vanish from view and I appreciate the stalking value of these markings. I also further realize its size and again feel fear rising. I am grateful to be aloft on the back of an elephant and hope that the mahout is very experienced. I know then that the power of this encounter will be with me all my life. Tigers are indeed fearsome and magnificent creatures and Blake's immortal lines come back to me whenever I recall this experience.

'Tiger, tiger, burning bright
In the forests of the night…'

Later we returned to the village and loaded many more elephants with tourists for their own very special experience.' PV.

This encounter occurred in 1982 – unhappily poaching subsequently decimated the tigers of Kanha due to the demand for dead tigers from Asian medicine. Gradual recovery has occurred more recently and numbers are reportedly above 100 once more (Wildlife Protection Society of India, web site 2003).

Where is the wildlife?

The world's highest levels of biodiversity occur in less-developed countries and these offer some of the world's most well-known wildlife-watching destinations. Shackley (1996) ranked the world's most 'popular' destinations for international wildlife watching based on numbers of tour operators. These were Eastern Africa (particularly safari-style viewing of large cats and ungulates), followed by Central and Southern America (rainforest wildlife and the Galapagos National Park). In some of the countries in these regions (e.g. Kenya, Costa Rica, Ecuador), wildlife is the major motivation for tourism.

Although wildlife occurs across the world, there are several variables that may influence the development of a wildlife-watching tourism industry. Global biodiversity is far from uniformly spread across the planet. In general, tropical regions have the greatest proportion of biodiversity and these coincide with the relatively less developed countries. For most life on earth we do not have accurate counts of the numbers of species, and many scientists acknowledge the limited prospect of identifying all the species before some disappear in the face of the present extinction spasm (Wilson, 1988). Even the estimates of numbers of species vary widely (from about 5 million out to 100 million) but all are well above the current number of described species (around 1.5 million). Only a much more limited number feature prominently in wildlife tourism. For these groups, not surprisingly, we are better informed. In particular, the global totals for amphibians, reptiles, birds and mammals are reasonably accurate now (Table 2.1). Even the fish are reasonably well known with the exception of those from the deepest parts of the ocean.

Table 2.1: Estimates of total numbers of species of various groupings of wildlife

Mammals	>4000
Birds	>9000
Reptiles	>6300
Amphibians	>4200
Sharks & Rays	>800
Bony fish	>18000

Adapted from Wilson, 1988

While the distribution of wildlife is uneven across the world, accurate numbers by continental region are difficult to estimate and many countries in the tropical world have no good estimates for even the best-known groups. Even at the continental level there are little comprehensive data, although some generalisations may be made. Africa (>2300 species), Asia (2700 species) and South America (>3000 species) have

very rich bird life and countries in Central America may be locally diverse and prolific. Africa (1150 species) is exceptional for mammal diversity but Australia has very high mammalian endemism (79%).

Clearly the type of wildlife of interest to tourists is a subset of the total figures and there are several variables that might influence the popularity of a particular animal class. As Higginbottom and Buckley note (2003) attractive wildlife resources for tourism mostly fall into one of the following categories:

- large numbers of large animals
- single iconic species, usually of large body size (what may be termed charismatic megafauna)
- areas of high diversity (species richness) where many different species may be seen

Table 2.2 shows the broad patterns of wildlife-watching tourism destinations with indications of the types of wildlife that are prominent at the locations and additional comments related to sustainability issues at those destinations.

Table 2.2: Major international destinations for wildlife watching

Region	Wildlife	Comments
Eastern and Southern Africa (especially South Africa, Kenya, Tanzania, Zimbabwe, Namibia, Rwanda)	Large mammal (and sometimes bird) watching as part of safari-game lodge experience. Principally in public protected areas; also private game reserves especially in South Africa. Mammals with high diversity, high abundance, large body size. Open plains and plateaus with large vistas make it easy to find and observe wildlife. Penguins and whales in marine and coastal areas (southern), hippos and crocodiles in wetlands and rivers.	Long experience of nature/ wildlife (safari) tourism. Ban on sport hunting and trophy trade in Kenya. Except for South Africa, most tourists are international. Significant environmental and socio-political threats. Many reserves fenced (South Africa) and wildlife professionally manipulated for sustainable management.
North America (USA and Canada)	Mainly large mammals and birds. Key species include several species of bears (especially polar bears in Churchill, Manitoba), large ungulates, arctic foxes, red wolf, coyote, bobcat, river otter, alligators, snakes, invertebrates. Centred on protected areas. Significant marine and coastal wildlife watching from cetaceans to pelagic birds.	Trend away from hunting to wildlife watching. Growth in birding. Strong domestic component to terrestrial wildlife-watching tourism. Major initiatives to link wildlife watching to conservation. Migratory component significant (adds seasonality and concentration).
Central and South America (especially Costa Rica, Belize)	Mainly forest fauna in areas of high biodiversity including Amazon basin. Some as part of general nature-based experience. Key species include various primates and birds. Increasing use of water-based marine and freshwater systems.	Central America generally better developed for tourism than South America due to greater political stability, closer to large market, strong protected area systems, multinational initiatives. Significant environmental and socio-political threats.
Southeast and South Asia (especially India)	Various forest fauna in areas of high biodiversity in SE Asia, mostly as part of general nature-based experience. Key species including orang-utans and Komodo dragon. More specialised wildlife watching in India. Mainly in protected areas. Some growth in marine wildlife tourism.	Wildlife tourism generally small but new areas and species becoming available. Significant environmental and socio-political threats. Significant future potential in some countries.
Pacific Ocean, includes Micronesia and Hawaiian Islands, New Zealand, Fiji, Galapagos	Primary focus on dive tourism with some focus on marine species (manta rays, sharks including whale sharks, coral reef organisms, whales and dolphins)	Marine tourism especially subject to growing pressures and need for close management. Many uncertainties needing research.
Australia and Papua New Guinea	International visitor interest in icon species (koala, kangaroo) and some specialised focus on marine environments including coral reef diving, whale watching, whale sharks. Endemic birds also a focus. Mainly in protected areas.	Well developed specialist infra-structure.

Partly based on Higginbottom and Buckley, 2003

In some countries much of the natural environment has been transformed into farmland with a subsequent loss of species richness. Small reserves may provide temporary refuges for species. In other countries the fauna are spread over very large distances, making tour operations quite challenging and expensive. Some particularly

favoured areas with high faunal diversity within relatively small areas are hotspots for wildlife tourism. For example, wildlife watching takes advantage of great concentrations at predictable times of the year (ungulates and associated predators in east Africa; forest birds in Costa Rica or Peru; migratory whale aggregations throughout the world; coral reefs and tropical rainforests). Remote oceanic islands, especially rich in sea birds and other wildlife, are increasingly visited by tourists. Part of this attractiveness probably reflects the ease of sighting individuals. For example, savannahs provide good opportunity for ungulate watching, especially if infrastructure (vehicles, hides, etc) is developed. Rainforests may, by contrast, be very difficult environments within which to see wildlife (unless guided by an expert). In some situations wildlife may be most active at night and require very specialised watching arrangements (for example Australian rainforest mammals are almost entirely nocturnal). The previous experience of the wildlife tourist will be an important factor in successful watching of new species. This has led to the development of very specialised guides and guiding services in wildlife watching that ensure even the most challenging animals may be seen.

What makes a great wildlife-watching tourism destination?

Table 2.2 provides a regional synopsis of wildlife watching elements, but for greater detail most data are compiled at the national level. In the end comparisons made by selected countries give at least a hint of the regional concentrations of wildlife. Given the diversity of wildlife, environments and total area of different countries, are there ways in which the key natural resources of wildlife-watching destinations can be assessed and some estimate made of potential success and sustainability of wildlife tourism for a given country? The data collated by the World Resources Institute on global environmental parameters allow a useful comparative analysis to be undertaken. Although there are similarities across the groups, the following analysis first examines birdwatching and then mammal watching as examples of wildlife-watching natural resource assessment. Similar analyses should be done at a finer scale both within countries and within other animal groups (for example, reptiles, fish and insects). Ryan (1998), for example, has reviewed crocodiles as target species for tourists. In this analysis the critical socio-economic and political variables of particular places are not considered, but these may well have an over-riding effect on visitor choice of destination, especially in the context of increasing personal safety concerns.

The top global birding prospects

Birds are fascinating to many people and the prolific literature in this area attests to the lure of birdwatching, partly at least, because birds are relatively easy to see and identify and they are at times abundant and sometimes conspicuous. The key natural resource variables proposed, and represented in Table 2.3, are as follows: the total number of species, the mean number of species per unit area, the percentage endemic species, threatened species and the percentage area protected. These variables relate to prospects of encountering a wide range of wildlife, relatively unusual species (not previously seen by tourists), rare species (threatened) and the likely sustainability of the resource (through protected area designation). At this global scale of assessment these figures are broad summaries of national condition and there is a need to be cautious in using them. Even so, some useful categories of potential birdwatching destinations emerge.

Table 2.3: Wildlife and protected area data for countries across the world

		BIRDS					MAMMALS				
Region/Country	**%PA**	**N**	**C**	**E**	**%E**	**T**	**N**	**C**	**E**	**%E**	**T**
AFRICA											
Egypt	0.8	153	33	0	0.0%	11	98	21	7	7%	15
Oman	16.1	107	39	0	0.0%	5	56	20	2	4%	9
Iran	NA	323	60	1	0.3%	14	140	26	6	4%	20
Botswana	18	386	101	1	0.3%	7	164	43	0	0%	5
Cameroon	4.4	690	193	8	1.2%	14	409	114	14	3%	32
Eritrea	4.3	319	141	0	0.0%	3	112	50	0	0%	6
Ethiopia	5	626	133	28	4.5%	20	255	54	31	12%	35
Ghana	4.6	529	186	0	0.0%	10	222	78	1	0%	13
Kenya	6	847	222	9	1.1%	24	359	94	23	6%	43
Madagascar	1.9	202	53	105	52.0%	28	141	37	93	66%	46
Mozambique	6	498	117	0	0.0%	14	179	42	2	1%	13
Namibia	12.9	469	109	3	0.6%	8	250	58	3	1%	11
Sudan	3.4	680	110	1	0.1%	9	267	43	11	4%	21
Nigeria	3.3	681	153	2	0.3%	9	274	62	4	1%	26
South Africa	5.4	596	122	8	1.3%	16	255	52	35	14%	33
Rwanda	13.8	513	373	0	0.0%	6	151	110	0	0%	9
Tanzania	14.6	827	184	24	2.9%	30	316	70	15	5%	33
Uganda	7.9	830	290	3	0.4%	10	338	118	6	2%	18
Zimbabwe	7.9	532	159	0	0.0%	9	270	81	0	0%	9
Congo DR	NA	929	153	24	2.6%	26	450	74	28	6%	38
OCEANIA											
Vanuatu	0	76	71	9	11.8%	6	11	10	2	18%	3
New Caledonia	6.2	107	87	22	20.6%	10	11	9	3	27%	5
Samoa	3.6	40	61	8	20.0%	6	3	5	0	0%	2
Solomons	0	163	115	43	26.4%	18	53	37	21	40%	20
Australia	7	649	72	350	53.9%	45	260	29	206	79%	58
New Zealand	23.4	150	51	74	49.3%	44	2	1	2	100%	3
Papua New Guinea	0	653	184	94	14.4%	31	222	63	65	29%	57
Kiribati	36.6	26	62	1	3.8%	4	X	X	0	0%	0
Fiji	1.1	74	61	24	32.4%	9	4	3	1	25%	4
F.S. Micronesia	0	40	96	18	45.0%	6	6	14	3	50%	6
ASIA											
Indonesia	10.1	1530	271	408	26.7%	104	457	81	222	49%	128
Malaysia	4.6	508	160	18	3.5%	34	300	95	36	12%	42
Thailand	13.8	616	168	2	0.3%	45	265	72	7	3%	34
Vietnam	3	535	168	10	1.9%	47	213	67	9	4%	38
Philippines	4.8	196	64	186	94.9%	86	158	51	102	65%	49
Brunei-Darussalam	21	359	430	0	0.0%	14	157	188	0	0%	9
Japan	6.8	250	75	21	8.4%	33	188	57	42	22%	29
China	6.2	1103	114	70	6.3%	90	400	41	83	21%	75
Mongolia	11.5	426	80	0	0.0%	14	133	25	0	0%	12
India	4.4	926	137	58	6.3%	73	316	47	44	14%	75
Bangladesh	0.7	295	122	0	0.0%	30	109	45	0	0%	18
Nepal	7.6	611	252	2	0.3%	27	181	75	2	1%	28
Pakistan	4.7	375	88	0	0.0%	25	151	36	4	3%	13
Afghanistan	0.3	235	59	0	0.0%	13	123	31	2	2%	11
Kazakhstan	2.7	396	62	0	0.0%	15	178	28	4	2%	15
EUROPE											
France	13.5	269	72	1	0.4%	7	93	25	0	0%	13
Germany	26.9	239	73	0	0.0%	5	76	23	0	0%	8
United Kingdom	20.4	230	80	1	0.4%	2	50	17	0	0%	4
Spain	8.4	278	76	5	1.8%	10	82	22	4	5%	19
Turkey	1.3	302	72	0	0.0%	14	116	28	2	2%	15
Belarus	6.3	221	81	0	0.0%	4	74	27	0	0%	4
Russian Federation	3.1	628	54	13	2.1%	38	269	23	22	8%	31
N&S AMERICA											
Canada	9.1	426	44	5	1.2%	5	193	20	7	4%	7
USA	13.1	650	68	67	10.3%	50	432	45	105	24%	35
Mexico	3.4	772	135	92	11.9%	36	491	86	140	29%	64
Belize	20.9	356	271	0	0.0%	1	125	95	0	0%	5
Jamaica	0.1	113	110	26	23.0%	7	24	23	2	8%	4
Panama	18.8	732	376	9	1.2%	10	218	112	16	7%	17
Costa Rica	14.2	600	350	6	1.0%	13	205	120	7	3%	14
Guatemala	16.8	458	208	1	0.2%	4	250	114	3	1%	8
Colombia	8.2	1700	356	67	3.9%	64	359	75	34	9%	35
Ecuador	42.6	1388	460	37	2.7%	53	302	100	25	8%	28
Argentina	1.8	897	140	19	2.1%	41	320	50	49	15%	27
Guyana	0.3	678	246	0	0.0%	3	193	70	1	1%	10
Chile	18.7	296	71	16	5.4%	18	91	22	16	18%	22
Venezuela	35.4	1340	302	40	3.0%	22	323	73	19	6%	24
Peru	2.7	1541	310	112	7.3%	64	460	93	49	11%	46
Brazil	4.4	1500	162	185	12.3%	103	417	45	119	29%	71

[compiled from WRI Earthtrends data collected by the World Resources Institute based on their 2003 digital database. (http://earthtrends.wri.org/). %PA = percentage of country in protected areas; N = number of breeding species; C = number of species per million hectares; E = number of endemic species; %E = percentage of species endemic; T = number of species threatened; Countries organised by region from Africa, Oceania, Asia, Europe, North America, South America.]

Table 2.4 provides a summary of the top ten countries for each of the variables identified in Table 2.3.

Table 2.4: Top scoring countries for the natural resource parameters in Table 3.

	BIRDS			MAMMALS			
rank	**N**	**C**	**%E**	**N**	**C**	**%E**	**%PA**
1	Colombia	Ecuador	Philippines	Mexico	Brunei-Darussalam	New Zealand	Ecuador
2	Peru	Brunei-Darussalam	Australia	Peru	Costa Rica	Australia	Kiribati
3	Indonesia	Panama	Madagascar	Indonesia	Uganda	Madagascar	Venezuela
4	Brazil	Rwanda	New Zealand	Congo DR	Cameroon	Philippines	Germany
5	Ecuador	Colombia	F.S. Micronesia	USA	Guatemala	F.S. Micronesia	New Zealand
6	Venezuela	Costa Rica	Fiji	Brazil	Panama	Indonesia	Brunei-Darussalam
7	China	Peru	Indonesia	Cameroon	Rwanda	Solomons	Belize
8	Congo DR	Venezuela	Solomons	China	Ecuador	Brazil	United Kingdom
9	India	Uganda	Jamaica	Colombia	Belize	Mexico	Panama
10	Argentina	Belize	New Caledonia	Kenya	Malaysia	Papua New Guinea	Chile

[Abbreviations as for Table 2.3.]

Combining the different elements of this assessment reveals clusters of very well-(natural) resourced countries for birdwatching tourism. Indonesia is a prime example of a very high scoring country. It has extraordinary diversity, very high concentrations, high endemism and a good start to a habitat protection program. Brunei-Darussalam is another potential high quality birdwatching destination with security built in with its 21% protected area. Ecuador is also a standout country for birdwatching investment. Very high species richness and the world's highest concentration, coupled with >40% of the country protected, overshadow the lack of national endemics. Venezuela is also first ranked and despite current political problems is well placed for the long run. In Africa the longer term prospects are not so good but may be enhanced by increased protection of habitat (including through private reserves managed in an integrated way). Tanzania is best placed along with Rwanda and Namibia. Kenya and Uganda have great resources but lack protection programs adequate to the task. Some other countries stand out because of the distinctive nature of their birds. Australia and Papua New Guinea have groups of endemic species so very different from birds elsewhere that birders will come anyway. In both countries some areas are very rich locally and already attract significant birdwatching tours (for a recent review of Australian birdwatching tourism see Jones and Buckley, 2001). Box 2.2 gives an example of bird watching tourism in Costa Rica and indicates the combination of wildlife resources and local community involvement that is a hallmark for successful destinations.

Box 2.2: Birdwatching in Costa Rica

Birding in Monteverde Cloud Forest

'The rough road climbs through cleared and degraded landscapes from the foothills through the midslopes to finally reach the thin ribbon of cloud forest at 2000 metres ASL. Appropriately shrouded in cloud these forests are extremely complex with each tree adorned with myriad epiphytes from many plant families. Within the forest is a magnificent diversity of bird life that, to the visitor, is spectacular. There are the ever-present motmots with distinctive calls and great beauty when finally sighted, somewhat reminiscent of the bee-eaters of Africa, Asia and Australia. Once embarked upon the forest-walking track the birds are more challenging to see but very rewarding. Amongst those fruit-eating species is the emerald toucanet whose green plumage blends well with the foliage of the trees. The aptly named resplendent quetzal, national bird of Guatemala and denizen of these Costa Rican cloud forests, is often elusive but once seen is never forgotten. The male is a gorgeous mix of red and green with glowing tones and magnificent tail.

Another forest species is the toucan – beautifully coloured with such an improbable beak. As expected in such forests there are numerous song birds many of which combine colourful plumage with extravagant songs. The golden chlorophonia is one example.

For me the peak experience, however, is the variety and beauty of the hummingbirds. These exquisite swift-flying jewels continuously zip and dart through the forest and cluster in gaggles around flowering patches. In one place we counted 7 of the 24 species known from this forest, each a living gem of tiny proportions and brilliant colour. Those visitors from beyond the range of hummingbirds find it hard to believe that these creatures are birds! I recall seeing a glass showcase at the British Museum of Natural History with 50 species displayed and not being able to imagine what it would be like to see one flying. Now, as I gasp at the beauty before my eyes, it is quite amazing and I know that this experience will remain permanently vivid.

The Monteverde Cloud Forest Reserve is privately owned and managed for conservation outcomes and funded by entry fees. Its presence, and the tourists it attracts for these peak wildlife-watching experiences, support a thriving community of lodges, restaurants, souvenir factories and stores developed by the local communities, as well as value-added facilities like butterfly gardens.'

Based on field notes of a study tour in 1992 (PV)

Birdwatching choices – some additional social and demographic dimensions

Many birders focus on identifying the greatest number of species possible from a given location (within local, regional or national boundaries). The increase in a birder's life list of species is an important element in the outcomes from birding activities. In some circumstances competitive birdwatching occurs amongst birders (sometimes on a lifetime/region basis, sometimes during a specified period). Achievement in these activities may take considerable skills and technical support and depending on the geographic scope may be expensive.

Jones and Buckley (2001) cite an example of measuring the appeal of a birding destination with regard to the cost per added species. Thus they indicate that seeing a

new species in the USA may cost, on average, $75 whereas a visit to Costa Rica (species rich country but relatively cheap to travel to and within) may be much more cost-effective – about $8–10 per species (anecdotal data based on 300 new species). The same authors suggest a trip to Australia may also be efficient for the international birder with their estimate of $22–26 per species (based on a recent trip yielding 340 new species).

The highly dedicated specialist birders market, already well developed and expanding, can involve considerable cash flow (see Vardaman, 1980, 1982; Valentine, 1984). Such birders called 'twitchers' in some parts of the world (Oddie, 1980, Millington 1981) are frequently impatient with the presence of lesser-skilled individuals and desire small group size with comparable experience base. Satisfaction comes almost entirely from nature observations, or related activities. By contrast a 'nature tour group' would tolerate a wider variety of skills; would not focus simply on birds and would be comfortable with a larger group and more variable individuals. Satisfaction would come partly from social elements not directly related to nature observation. A third example might be non-specialist tourists whose interest is in 'seeing somewhere different from home'. These tourists may also have an interest in nature and typically make up a high proportion of visitors to nature destinations accessible by road (e.g. National Park front country). Satisfaction for this group comes mainly from the superficial interaction with nature and the sense of discovery associated with it. Such market segregation may be desirable to maximize satisfaction but the advantages and disadvantages of particular styles for nature conservation are uncertain.

The most recent account of birdwatching resulting from the US Fish and Wildlife Service studies of watchable wildlife (La Rouche, 2003) concluded that there were 46 million birdwatchers in the USA. The average birder in this study was 49 years of age with a higher than average income and education, female, married and white. In this US study the environments used for birding and the types of birds watched were explored. The most common setting was woods, followed by lakes and streamsides, brush covered areas and fields (all above 60%). Ocean areas were less favoured (27%). The kinds of birds watched to some extent reflect this environmental preference. Waterfowl and songbirds were the most common groups followed by birds of prey and waders. The people identified as birders in this survey all claimed that they had an active interest in birds. The study attempted to refine a number of categories of avidity using the number of birds that people stated they could identify by sight or sound, the number of days spent birdwatching and whether they kept a life list (a record of all birds sighted during the birder's life). Interestingly the 2001 results closely paralleled the results of the 1980 survey that asked the same questions (La Rouche, 2003). Only 10% could identify more than 40 species and around 5% kept a life list (usually a sign of a particularly ardent birder).

In the USA the American Birding Association (ABA) is a non-government society with aims to inspire all people to enjoy and protect all birds. It publishes the journal *Birding* and also *American Birds* within which may be found much evidence of the nature of the very keen birder, including the idea of 'big days' in which a birder or a team of birders seeks to set a record number of bird species sighted in a single day. A big day may target personal records for the particular location, for the State or country or for other parameters. It may be for given months also and may be a single or team effort. For example the ABA lists its big day results on the Internet by state (Florida's

best is 179, Kansas is 225). International birding big days are also promoted and recorded. The results accord somewhat with the outcomes of the analysis on ideal birding potential earlier in this chapter. For Peru, for example, the highest big day was 331 species; for Costa Rica 308; for Australia 249; and for South Africa 247 (see the ABA web site http://www.americanbirding.org/bigday/bigchampI.htm). The ABA also compiles life lists covering specific regions (for South America for example the top 30 life lists are all over 2000 species seen from that region, for Africa and Eurasia the best are also over 2000 species and for Australasia nearly 1000 species). The best world life list in 2002 reached 8195, a remarkable total but with many others almost as high. There are many other organisations around the world that support recreational bird watching including Birdlife South Africa, Birds Australia and the British Trust for Ornithology. On the Internet, virtual groups like Eurobirdnet provide support and coordination for birdwatching regionally (in this case most countries of Europe have Eurobirdnet coordinators). Additional appreciation of the birding phenomenon can be found in accounts by some of the more famous and articulate birders.

Increasing knowledge and participation in bird-watching has seen the development of large numbers of dedicated birders globally. Their needs are increasingly met by specialised tour operators who provide extremely high-level naturalist and local knowledge. Some firms are regional or national but others are global, catering for the demand for international birding experiences. Peregrine Bird Tours is an example of a global firm (administratively based in Australia), operating for many years and taking birders from many countries to the most highly diverse birding places on the planet. As an example of the global reach and diversity, Peregrine Bird Tours operated tours over the past two years to Northern India and Nepal, Peru, Namibia, Christmas Island, Ecuador and Galapagos, Cameroon, Cape York Peninsula (Australia) and Burma. In 2004 they will go to Taiwan and Okinawa, Madagascar, Malawi, Australia East Coast and Argentina.

The very best prospects for mammals

In assessing the natural resources for mammal-based tourism, the comparison between countries utilised the same basic variables – species richness, concentration (species per unit area), endemism and protected areas (see Tables 2.3 and 2.4). Initially the most diverse countries for mammals are Mexico, Peru, Indonesia, the Congo and the USA. In the top 15 are also the east African mammal giants of Kenya, Uganda and Tanzania along with India and Ecuador, all above 300 species. Some additions to the first ranked countries occur due to density or concentration including Central American, south-east Asian and African countries. The existence of high levels of endemism draws attention to Australia, Madagascar and other island countries.

A significant additional factor for mammals relates to the kind of environment in which the animals occur. Some of the highest species richness and concentrations occur in tropical rainforests. These environments are notoriously difficult to view wildlife within (species that are well concealed in dense foliage and/or nocturnal). Savannahs are potentially more attractive for popular mammal watching and it is here that the east African and south African countries prevail. Not only are these countries rich in species (250 – 300 species) but they also have the very large and very numerous ungulates and their associated predators occurring mostly in environments that allow relatively easy watching from the backs of comfortable vehicles. It is this combination that has allowed the dominance of mammal watching tourism to develop

in eastern and southern African countries. This current opportunity is not as well matched with longer-term protection (with generally inadequate protected areas in most of these countries). The exceptions (e.g. Tanzania) may have stronger long-term prospects if the resource can be properly managed. Box 2.3 gives a typical example of the widely available wildlife safari opportunities in east Africa.

A recent development in both south and east Africa is the provision of 'walking safaris' in which visitors are accompanied by expert guides on walks that may range from a half-day to many days within game reserves. This new form of wildlife watching has a high-risk component when species such as lions, rhinos and buffalo are present. Occasionally the armed guides are forced to shoot individual animals to protect the tourists. This development also raises insurance issues for operators.

Box 2.3: Wildlife safari experience in east Africa

A Crater full of wildlife

'Ngorongoro Crater World Heritage Area in Tanzania is a magnet for wildlife-watching tourists. It provides a classic east African wildlife experience and offers elephants, lions, rhinos, buffalo and giraffes as well as hippos and hordes of grazing ungulates. The physical geography provides controllable access and accommodation is situated along the rim of the crater (in the forested areas) with day trips descending 500 metres to the floor of the crater. This pattern helps protect the wildlife from poaching with after-dark patrolling guards given orders to shoot on sight. In the early morning numerous safari vehicles disperse over the extensive grasslands and woodlands in the huge caldera – 20 km diameter. This is a place where most of the big five are easily seen and where the herds of wildebeest and zebra are hard to avoid. Once the desire for large mammals has been partially sated there are great opportunities for birding from the crowned cranes to flamingos, many shrikes, hornbills, woodpeckers, larks, stonechats and coucals, mousebirds and hoopoes, sunbirds and raptors.

Each safari vehicle, with open top and high sides, carries a group of passengers bristling with cameras and binoculars. The larger animals are approached to enable close viewing (sometimes not close enough for some passengers who may try to persuade the guide to go too close, for better views or photographs). Everyone has a chance to see the animal and many take photos. Little interpretation occurs on most vehicles. As the vehicles traverse the floor of the crater they congregate from place to place, attracted to specific animals as they rest or feed, or sometimes hunt. The larger or less common species create a flurry of attention for a while before the vehicles move on to other opportunities. A dusty pan might hold a pride of lions basking in the heat. A woodland edge protects two or three rhinos with enormous pointed horns – amazing animals to see so close. Elephants may be wary but sometimes allow a vehicle near. In this reserve vehicles are confined to tracks, unlike Masai Mara in Kenya where vehicles traverse the grasslands at will.

At midday the vehicles gather in droves at wetlands where hippos bathe in public gaze. Out come the specially packed lunches, each with its chicken leg atop a salad, much to the delight of the black kites who swoop and grasp the morsel from the fingers of the unsuspecting tourist. The drivers hide their chuckles.

The evenings at the Crater rim lodges may be cool and misty and zebra graze amongst the lodges. Stories of encounters are traded and species lists compared. Owls hoot'

From a field note book in 1995 (PV)

An expansion to other wildlife: from birding to butterfly watching

An interesting recent development is the emergence of new taxa as subjects for wildlife watching. For example during the past decade, there have emerged an increasing number of people engaging in butterfly watching. The first field guides for watching rather than collecting butterflies have appeared (Glassberg, 1993) and the development of digital imaging and the internet has enabled a rapid growth of this

wildlife-watching interest. This development is likely to mature much more quickly than was possible for birdwatching last century and is already taking advantage of the experience from the birdwatching industry. Amongst other emerging specialisms are marine organisms such as nudibranchs and leafy sea dragons.

Sustainability Issues - Lessons from marine wildlife watching

This section presents an overview of some of the key considerations for ecological sustainability in wildlife watching using a marine example. Additional material on ecological sustainability relating to terrestrial wildlife watching is given in Chapter 11.

There are very many marine wildlife watching opportunities globally and these have been developed into a significant and growing industry in many countries. In a recent review of Australian marine wildlife watching Birtles, Valentine and Curnock (2001) identified over 70 target species ranging from penguins, turtles, sea dragons, sharks and other fish to seals, dugongs, dolphins and several species of whales. Marine wildlife watching may be divided into three distinct elements: shore-based observations, boat-based observations and the very widely available in-water activities. The latter includes swimming and diving that is focussed on marine wildlife including some very specialised opportunities (diving with leafy sea dragons or aggregating giant cuttlefish in South Australia, swimming with whale sharks in tropical waters or with dolphins and whales across a wide latitudinal range). Subjects of marine wildlife watching are frequently part of species and/or populations that are recovering from gross over-exploitation. Numbers may therefore be low anyway and animals are particularly vulnerable. Sometimes marine wildlife encounters occur at critical life history stages with complications for management. For example during migration (high energy requirements, greater vulnerability to predators, individuals and groups more easily separated), breeding (courting, mating, birthing, suckling), feeding, resting and socialising. One interesting additional element of marine wildlife watching is that the industry may sometimes find itself competing with other resource exploitation activities. For example commercial fishing may produce changes in the size classes of target species that have an adverse effect on scuba diving resources.

The whale watching industry

Hoyt's recent (2000) update of his original seminal work on the worldwide whale watching industry and its economic value provides a comprehensive review of the extraordinary scale and growth rate of this international wildlife phenomenon. His surveys showed that the number of whale watchers (his definition included all cetaceans) grew from 4 million in 1991 to 5.4 million in 1994 and 9 million in 1998 with the growth rate being most rapid (13.6%) in the mid to late 1990's. Three countries (USA, Canada and Spain – the latter mainly because of the Canary Islands) had over 1 million whale watchers and Australia and South Africa were fast approaching this figure. He documented that whale watching was taking place in 87 countries around the world, in contrast with only 31 in 1991. Thirty-four of the 40 International Whaling Commission (IWC) member states were involved in whale watching. This generated an estimated US$1,049 million of total expenditure in 1998 from direct and indirect revenue. The number of communities involved in whale watching had jumped by 200 from 1994 to a total of 492 and in many cases the benefits were substantial and the community involvement was profound.

There is a significant lack of knowledge about biology and behaviour of the target species involved. Rarity, uniqueness, status as an intelligent mammal, interactivity (including curiosity and sometimes highly developed boat or swimmer-seeking behaviour), often-large size and history of exploitation all contribute to growing status of whales as iconic 'must see' species. Low numbers and iconic status mean that the probability of encounter is sometimes low and there is high pressure on operators to deliver encounter experiences and hence overly-energetic attempts to engage reluctant animals. There is little research on direct impacts of wildlife watching on whale species and has mostly been focussed on odontocetes and especially dolphins. Very little research has been done on baleen whales and most of that is on coastal species (Humpbacks, Gray and Right whales). The oceanic rorquals (*Balaenoptera* includes Blue, Finback, Sei, Brydes and Minke) have been largely ignored apart from recent work on Dwarf Minke Whales in the Great Barrier Reef (Birtles et al. 2002, Valentine et al. 2003). As a consequence short-term impacts are poorly understood and long-term impacts virtually unstudied. There is considerable difficulty in linking short-term and long-term effects. Cumulative impacts are often highly likely but are particularly difficult to measure. These require long-term identification of known individuals. It has proven difficult to find consistent research funding for the required long-term photo ID studies.

Direct impacts of wildlife encounters, including whale watching, have to be examined in the context of other threats to marine wildlife including: bycatch and entanglement; noise pollution including low frequency sound; ship strikes (a consequence of recovering populations, increase in traffic and higher speed vehicles); hunting; coastal and oceanic pollution and litter.

The scientific basis for much management of whale and dolphin watching is tenuous. Many of the current recommendations in guidelines and codes of practice have been based on experience rather than detailed experimental research. Sometimes legislation and guidelines developed on one species are applied inappropriately to others (eg. regulations for large coastal whales such as Humpback and Right being applied to small whales such as Minkes that behave more like large dolphins). There are particular management challenges for the fast growing swim-with cetacean interactions – both from the dedicated tourism industry but also from incidental encounters and private recreational interactions.

Given our lack of knowledge about many quite basic aspects of the biology and behaviour of target species and of our impacts on them, there is a need for use of the precautionary principle (see Chapter 11). There is also a need for greater understanding of this important management tool. Both elements of this principle need to be appreciated: (a) caution in the face of our lack of knowledge but also (b) lack of scientific certainty is not an excuse for management inaction if the consequences are severe or irreversible.

There is considerable importance in understanding both the animals and the humans who are watching them, particularly for the closer, more intimate interactions involved in swim programs. These are two-way interactions with the behaviour of the animals impacting on the people and vice versa. The successful management of such encounters requires the best available natural science and social science research. Ultimately it is usually not the wildlife being managed but people (Chapter 11). It is therefore very important to understand the attitudes, motivations and experiences of the human participants (Davis, Birtles, Valentine, Cuthill and Banks 1997, Valentine

et al. 2003). They are managed principally through education and good management by the crews and also through the use of good interpretive material. Even so, it is often unclear what are the best indicators of sustainability.

While management of all wildlife watching tourism is crucial (see Chapter 11), marine situations have added complexity. Remoteness contributes to difficulties with surveillance and enforcement (including significant cost factors). Cooperation between management agencies and industry operators is particularly critical for marine based wildlife watching. A very good example of how this might work is the relatively new Dwarf Minke Whale tourism in the northern Great Barrier Reef (Birtles et al. 2002). This example demonstrates collaboration between individual tourism operators, their wildlife-watching customers, a research team and the various management agencies responsible for the whales.

Issues for environmental sustainability of wildlife-watching tourism

As already noted in the analysis of national wildlife-watching resources (above) the key foundation for wildlife watching is conservation of the wildlife. Without this wildlife tourism is simply short-term mining of the resource and has no role in a modern sustainable society. But such conservation has many dimensions and is a challenge for all countries. In wealthy countries there will often be high-yielding alternative uses for the habitat. In poorer countries the choices may appear to be impossible – short-term personal survival versus long-term intergenerational benefits. In all countries there are many stakeholders in wildlife watching and ensuring the development and sustainability of such tourism is a difficult task. While Governments have special, often central, roles in ensuring proper legislative protection and resources for conservation, other partners are also crucial. The habitat managers (protected area managers, private landowners, conservation NGOs, traditional owners) have high responsibility for the day to day outcomes. Community groups may offer political, financial and intellectual support for wildlife-watching ventures. Tour operators need to be part of planning and management. Finally tourists are critical for the financial and political success and if properly managed and nurtured (in particular through interpretation) may become valuable advocates for more resources and better conservation outcomes. Underpinning these components of sustainable wildlife watching is capacity-building at all levels.

Eagles et al. (2002), in their guidelines for planning and management of tourism in protected areas, conclude that governments should make improvements to a number of critical areas. These include support for effective legislation with adequate resources for implementation, creation of national policies on protected areas and the management of tourism and development of a management plan for each protected area.

Some countries have formalised close relationships between the environmental management arms of government and the tourism and recreation arms. For example in the USA the National Park Service has a policy to develop and maintain constructive dialogue and outreach effort with state tourism and travel offices (as well as private businesses in the tourism industry). In Australia the Ministerial Councils responsible for management of World Heritage sites usually consist of the Minister of the Environment and the Minister of Tourism, thereby ensuring close collaboration. The European Charter for Sustainable Tourism similarly emphasises not only the core need to protect and conserve the natural environment but the significance of partnerships

(including local residents, local businesses, tourists and the management agency). One key element of the Charter is to prepare and implement a sustainable tourism strategy and action plan for each protected area.

Prospects for the future of wildlife-watching tourism

The classic paper by Budowski (1976) exploring the prospect of symbiosis between wildlife and tourism has been frequently cited. Many subsequently have been sceptical about the potential for tourism to be a positive force for wildlife and have identified potential problems (Valentine 1984, 1992, Isaacs 2000, Chapter 6) as well as opportunities (Valentine 1993, Chapter 6).

There is scope for misinterpretation by visitors about wildlife and their needs, and there is a large literature reflecting that (for example relating to provisioning wild animals – see Orams (2002) for a recent review). However, much habituation of wildlife is accidental or incidental. Whether it is kangaroos or possums in camping grounds in Australia, bears in the USA and Canada, coatimundi in Argentina, black kites in Ngorongoro Conservation Area, the outcomes certainly change wildlife behaviour. There are some examples of deliberate provisioning to ensure predictable tourist outcomes and the long term sustainability and behaviour modification consequences are sometimes weighed up against the immediate economic benefits from the industry. Wright (1998) notes that changing views of urban populations about animals may lead to incorrect interpretation and skewed influence of management policies. Hughes (2001) raises a related issue with regard to dolphins in the UK. The rise of concerns for individual animals may help ensure better management guidelines (for example in the wild dolphin and whale tourism industry) but may also create difficulty for the more interventionist management practices required through habitat fragmentation and reduction (culling programs for instance).

The enthusiasm of wildlife tourists for their target species creates a different kind of challenge. Here our urges to get too close discomfort the very creatures we desire. Whale sharks in Ningaloo marine park in Australia, hunting cheetah in Kenya, elephants in South Africa and numerous rare birds everywhere have been subject to disturbance from wildlife watchers. In many instances the desire for greater proximity is driven by the thirst for a close up photograph and is often enabled by professional guides in need of better tips. In this context sustainable tourism needs better training and salaries for guides, better performance management for parks staff and better ethics and guidelines for tourists. These are all important elements of sustainable tourism. For many elements of the wildlife watching industry such guidelines (for operators and tourists) are now being supplemented with regulations associated with permits for operators. A good example of cooperation in the development and implementation of these guidelines and codes of practice is the new Dwarf Minke Whale swim program in the Great Barrier Reef (Birtles et al. 2002; Valentine et al. 2003). A coalition of industry, researchers and managers, with input from tourists, has worked to ensure the emerging industry is well placed to ensure sustainability. Knowledge is a critical element in such codes of practice and guidelines. One important lesson is that each species may be different and require careful research and monitoring as a standard part of any wildlife-watching program. Chapter 11 provides many examples of approaches to sustainable management of wildlife encounters.

One of the very interesting prospects for wildlife watching is a shift or expansion of the industry into private property (see also Chapter 6). Already there are examples

in South Africa of many private landowners managing their land for wildlife watching. In some cases such owners are collaborating with government protected areas so that a larger extent of area may be jointly managed (dropping fences for example between private game parks and the Greater St Lucia Wetlands Park in South Africa). Abandoned grazing lands may also be developed as wildlife parks – one of the best examples is also in South Africa, the Pilanesberg National Park. Monteverde Reserve in Costa Rica is a famous example of private (in this case cooperative) landowners managing their land for conservation for wildlife watching (see Box 2.2 above). In the USA there are many examples (Benson 2001) and in Canada, the number one activity of vacation farm visitors is wildlife watching (Fennell and Weaver, 1997). As private landowners increase their interest in managing lands for wildlife watching, the overall security of conservation efforts should increase due to the ecological benefits of increased habitat area. The subsequent challenge will be to ensure coordinated management within the ecosystem-based model of modern landscape ecology (Brunner and Clark 1997; Soule and Terborgh 1999)

Ecosystem-based management as a philosophy and practice is already official policy in, for example, the US National Park Service, the US Fish and Wildlife Service and the US Forest Service, three major land management agencies involved with wildlife watching. This commitment to ecosystem-based management is now widespread through IUCN and other conservation organisations.

A final aspect of future wildlife watching is the role of technology (Higginbottom and Buckley, 2003). The enthusiasm for proximity to wildlife and its adverse effects on target species may sometimes be addressed through technology. Already virtual access is provided at many sites from penguin rookeries to seal breeding grounds. Where this is in association with physical proximity to the site (but slightly removed) visitors may actually enjoy enhanced experiences in greater comfort and safety, with little or no impact on the wildlife. Using sophisticated video, transmission and screening equipment visitors can obtain even more intimate encounters. In some instances such images are now available on the internet as a form of ersatz tourism (although this is unlikely to be a substitute for real tourism). Perhaps of greater significance is the prospect of technology supporting the essential monitoring needs of wildlife watching. Already some partnerships exist between management agencies, tour operators and tourists to provide continuous monitoring for management purposes.

The way forward

Wildlife watching tourism is a major element of nature-based tourism and is present across a wide spectrum of environments and countries. Some countries are particularly well-endowed with natural resources for wildlife watching. For this form of wildlife tourism to be translated into successful future growth of the industry there needs to be consideration of a number of other factors and many of these are addressed in parts 2 and 3 of this volume. For the industry to be sustainable, a collaborative approach using ecosystem-based management approaches offers greatest prospect. There is a significant need for capacity building at all levels and for strong government leadership to enable best-practice codes and guidelines to be implemented. All stakeholders should participate to ensure a full spread of benefits but the crucial task is conservation of the wildlife already threatened by extensive habitat loss and in most countries inadequate habitat protection. There is also a large number of uncertainties

associated with wildlife watching. These include inadequate knowledge about the effects of wildlife watching on target species; a lack of clarity about the desire for proximity in wildlife watching tourists (including the willingness to take risk and uncertainty as part of the experience); the scope for expansion into new groups of target species and their likely appeal; the kinds of economic developments that are compatible with, or at least not destructive of, wildlife watching; the sustainability of an increasingly interventionist management style for wildlife and identification of appropriate indicators for monitoring and sustainability measures. It will take considerable cooperation between researchers, industry and management to address these concerns and take advantage of the opportunities.

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Chapter 3

Zoo Tourism

Andrew Tribe

Introduction

Zoos are perhaps the oldest form of wildlife tourism; efforts to tame and keep wild animals in captivity are nearly as old as human society itself. The first documented examples were the animal collections associated with places of worship in Ancient Egypt around 2,500BC (Loisel, 1912). These were simply glorified 'menageries', a term used pejoratively to describe collections of captive animals kept solely for the purposes of display, religion, or for the aggrandisement of the owner (Rothfels, 2002). In ancient Egypt, the animals were kept primarily for their religious significance. Later, other ancient societies including the Greeks, Romans and Chinese also established menageries to display the wealth and prestige of the owners, and to provide for exotic hunting and entertainment (Mazur, 2001). The tradition of gathering and holding impressive animal collections by royal and noble families continued into the 18th century in different parts of the world (Hancocks, 2001).

The history of the modern zoo began in the late 18th and early 19th centuries with the formation of the first 'public zoos', open to all (Baratay and Hardomin-Fugier, 2002). The first of these new zoos was the Jardin des Plantes, opened in 1793 in Paris. It was followed by similar establishments in London (1828), Amsterdam (1843), Berlin (1844) and Central Park, New York (1862). These zoos represented a significant change, for in addition to public display they were established to support scientific endeavour and public education (Koebner, 1994). For instance London Zoo was based on the philosophical foundation of scientific advancement and didactic enlightenment (Hancocks, 2001). It was immediately popular, and soon became the most fashionable venue in London. The scientific principles on which it was founded and its setting in a large public open park with informal, naturalistic landscaping were to be the pattern of development for new zoos all over the world for the next hundred years.

However, by the 1960s, many zoos were in a parlous state: old fashioned, badly run and increasingly out of touch (Brambell, 1992). Their survival depended upon them becoming seen as an integral and relevant part of today's society, and in developed countries particularly, zoos began to respond to growing environmental and animal welfare concerns. As Knowles (2003, p.29) explains: 'The zoo person of the second half of the century became a conservationist and it was this new philosophy that was to drive the many changes that have occurred in the last decade'. These zoos now strive to become conservation centres, and in so doing, they have embraced three justifications and objectives for keeping wild animals in captivity: conservation, education and research (Serell, 1981; Cherfas, 1984; Broad and Weiler, 1998; Hanson, 2002). Thus the evolution of zoos from menagerie, through zoological garden to conservation centre, can be seen as an illustration of the history of the Western World, in which civilisation has slowly come to appreciate, value and conserve nature (Rothfels, 2002).

The history and development of captive animal displays can also be understood by reference to first, second and third generation exhibits (Shettel-Neuber, 1988). The label first generation refers to the barred cages used in the 18th and 19th centuries to display exotic animal species, which were designed primarily to display the animals in isolation to the visiting public. As Martin (1986) explains, large size, bizarre appearance or assumed ferocity was sufficient reason in themselves for displaying the animal, rather in the mode of a stamp stuck on an otherwise blank page of an album. In the 20th century these cages were replaced with larger, more open cement enclosures often surrounded by moats. However, over time it became clear that these too were unsuitable for the animals kept in them and a rising concern over animal welfare meant that they were no longer acceptable to the visiting public (Polakowski, 1987; Shettel-Neuber, 1988; Kirkwood, 2003). From the middle of the 20th century many zoos developed more naturalistic enclosures that sought to replicate aspects of the displayed animals' natural habitats. These third generation exhibits provided more space for the animals, and typically used more vegetation and disguised barriers to separate the animals from their visitors (Shettel-Neuber, 1988).

At the start of the 21st century, exhibit design continues to develop, as zoos seek to better fulfil their conservation and education objectives. The latest generation of exhibits combines technology, new construction techniques and a variety of additional interpretive media to create what has been referred to as an immersion experience (Woods, 1998). The effectiveness of these zoo displays in achieving the zoos' interpretation goals are discussed more fully in Chapter 12 of this book. Unfortunately, there are still zoos in the world which have failed to develop and improve, and where the standards of animal welfare are still of concern. For instance, less scrupulous zoos in the west have yet to embrace accepted standards of husbandry and care (Knowles, 2003), while in developing countries, many zoos might be said to provide inferior living standards for their animals (Mullan and Marvin, 1999). The continued existence of such institutions illustrates the both the diverse nature of the zoo industry, and the continual battle to balance public expectations with commercial reality.

As Hediger (1969) and Mitchell (1991) point out, in addition to conservation, education and research, zoos have to have a fourth justification: recreation. They provide a pleasant setting for tourists, local visitors and family outings, and can be an integral part of the social and cultural life of the community. Cherfas (1984) goes further, and asserts that this recreational role is critical to zoos. His view is that if people do not pass through the metaphorical turnstile, the zoo is not a zoo: it may be a school, a breeding station, an experimental laboratory, but it is not a zoo, and without people it will not survive.

This, then, is the major quandary for today's zoos – how to attract and entertain their visitors, without compromising their other objectives– education, conservation and research. Although zoos have been a popular and traditional part of society, their future is by no means assured. Many are seen to be traditional and old-fashioned with little scope for change, competing in a tourism industry with innovative and exciting new destinations. The welfare of zoo animals is still controversial while the role of zoos in conservation is yet to be fully understood or appreciated. London Zoo is a typical, traditional city zoo, which has struggled to maintain its place in society. In Box 3.1, the characteristics and history of this zoo are summarised.

Box 3.1: London Zoo

Mission statement:

To achieve and promote the worldwide conservation of animals and their habitats.

History:

Founded in 1828, occupies a 36 acre site (leased form the Crown) in Regent's Park, London.

Administered by the Zoological Society of London (ZSL), which also runs Whipsnade Wild Animal Park and the Institute of Zoology. ZSL is a registered charity.

London Zoo was based on the philosophical foundation of scientific advancement and didactic enlightenment (Hancocks, 2001). These principles and its setting in a large public open park with informal, naturalistic landscaping were to be the pattern for new zoos all over the world for the rest of the century.

However, by the 1970s, London Zoo appeared decrepit and old fashioned and in 1992 it was in such severe financial difficulties that appeared likely to close. Stringent measures were taken to improve efficiency and cut costs, (including substantially reducing the number of animals and staff) while public donations gave the zoo time for these changes to be implemented (Lyons, 1991).

Since then, a number of new projects have been completed: macaw aviary, children's zoo, pigmy hippo enclosure, and Millennium Conservation centre.

Market:

Attracts around one million visitors annually, and has a turnover of more than £10 million.

87% of visitors are from the UK, with 50% from London (C. Masters, pers. com.).

Attendances fell through the 1980s but have remained stable for the past few years.

Display:

The large and varied collection of animals concentrates on threatened species to whose survival the Zoo contributes by captive breeding, on species of educational value, and on those of particular interest to the public.

Many zoo buildings have architectural and historical merit (thirteen are listed by the National Trust). They span the whole history of the zoo from the Raven's Gate in 1829 to the Millennium Conservation Centre in 1999.

Conservation:

ZSL undertakes conservation projects worldwide including many *in situ*. This work is supported by the fees it earns, plus grants and donations. The largest project is the King Khalid Wildlife Research Centre in Saudi Arabia where two threatened species of gazelle are being captive-bred and re-introduced to the wild. This project employs 34 people.

ZSL also has an educational role: London Zoo takes in about 60,000 school students each year, it undertakes zoological and conservation research, it publishes scientific journals and holds scientific meetings, and maintains the UK's principal specialist zoological library.

Sources: Tisdale (1993); Bell (2001); ZSL (2003).

The discussion so far has addressed zoos without reference to their role in tourism. Zoos are unusual amongst wildlife tourism destinations in that, while the proportions may vary, most visitors to most zoos are local residents, not tourists (Hunter-Jones and Hayward, 1998). For instance, of the estimated 8 million people to visit Australian zoos each year, approximately 5 million (62.5%) were domestic with the remainder being from overseas (ABS, 1999). Swarbrooke (1995) and Mothershaw (1997) have provided similar evidence for the UK by reference to Chester Zoo, where most zoo

visitors were drawn from the local area or region, and where the zoo is consequently a vital component of the city's economy and sustainability.

Perhaps as a consequence of this, zoos in the past generally have not seen themselves as being in the tourism industry, but rather as an integral part of their local communities. This aspect is discussed more fully later in this chapter. However, as they have become more business oriented, zoos are now marketing themselves as wildlife tourism destinations. Today, zoos are organisations seeking to satisfy multiple stakeholders with limited resources, and consequently zoo managers must tackle a number of important challenges (Turley, 1999a). These include maintaining a satisfactory balance between running the zoo as a tourism business and a conservation organisation; generating sufficient finance and funding; effectively communication their roles in order to attract an optimum number of visitors; managing the demands of the animal collection and attaining cultural status on the basis of their conservation work. To do this effectively will require zoos to be efficient, competitive businesses within the broader wildlife tourism market.

The zoo industry

There is a large number of zoos and wildlife parks throughout the world. In fact, because of the enormous variation amongst the institutions that are known as 'zoos', it is difficult to find a precise definition, which covers them all. However, as the World Zoo Conservation Strategy (IUDZG/CBSG (IUCN/SSC), 1993) explains, there are two characteristics that all such institutions have in common:

- Zoos possess and manage collections that primarily consist of wild (non-domesticated) animals, of one or more species, that are housed so that they are easier to see and to study than in nature.
- Zoos display at least a portion of this collection to the public for at least a significant part of the year, if not throughout the year.

Consequently, regardless of the composition of their collections, their official name (zoo, aquarium, sanctuary, fauna park etc.) and their type of ownership, all these zoological institutions will be known by the general term 'zoo' in this chapter. The various types of zoo and their animal collections are described in Box 3.2.

Box 3.2: Variation in zoos and their animal collections

The institutions collectively designated as 'zoos' vary greatly with respect to their animal collections. They may include:

- General collections consisting of representatives of all the vertebrate classes: mammals, birds, reptiles, amphibians and fish. Institutions such as these usually call themselves 'zoos'.
- Specialized bird collections. These may be called bird parks, waterfowl parks, parrot gardens etc.
- Specialized reptile collections (e.g. reptile parks, vivaria)
- Specialized marine mammal collections (e.g. aquaria, dolphinaria, marine zoos).
- Specialized fish collections. These may include aquatic and terrestrial vertebrates (e.g. aquaria).
- Specialized insect collections (e.g. insectaria, butterfly houses).
- Specialized collections of other mammal groups (e.g. primate zoos).

Source: IUDZG/CBSG (IUCN/SSC), 1993

With such a diversity of facilities, it is very difficult to calculate the exact number of zoos throughout the world although it has been estimated that there are more than 10,000 (IUDZG/CBSG (IVCN/SSC), 1993). The International Zoo Yearbook provides an annual list of zoos of the world and the 2003 edition includes 922 zoos from 85 countries (Olney & Fisken, 2003). However, this is by no means a comprehensive list, because the information is supplied voluntarily by the zoos and does not include many smaller institutions. For instance, the Australian listing includes just 17 zoos while there are an estimated 209 captive wildlife facilities in that country (K. Higginbottom, pers. comm.).

Nevertheless, such a list does demonstrate the extraordinary geographic range and diversity of zoos across the world. Each zoo is unique (Hutchins, 1988; Mellen, 1994) and they may be characterised in terms of size, location, management and marketing expertise, organisational structure, number and variety of species displayed (Shackley, 1996; Hunter-Jones and Hayward, 1998). They include institutions under private or public ownership, and exist in both developed and developing countries. Thus zoos are perhaps the most widespread and available form of wildlife tourism in the world being marketed across all cultures and socio-economic levels.

As such a significant segment of the tourism industry, zoos can make a considerable contribution to the economy of their local region, city or even nation. Through their business activities, zoos create employment, purchase goods, materials and services, earn foreign exchange through their visitation by overseas tourists, and generate operating surpluses which are usually reinvested in zoo development projects (Tribe, 2001). For instance, the Australian zoo industry with eight million paid admissions per year, has an annual turnover of some $143 million, generates an operating surplus of $16 million, and employs almost 2,000 people (ABS, 1998).

The majority of zoos are found in cities, where they have the potential to attract large numbers of visitors. These metropolitan zoos typically display a large number and diversity of species, in relatively small groups and enclosures (Ford, 1998). The modern trend for presenting animals in their natural physical and social environments has resulted in the development of safari parks and open-range zoos. These represent a minority of zoos, but are becoming increasingly popular (Ford, 1998). Typically located outside major cities, they are set on a larger area but attract fewer visitors than their city counterparts. They tend to display a greater number of individuals from fewer species, to simulate natural social groupings and behaviour.

The World Zoo Conservation Strategy (IUDZG/CBSG, 1993) reckons there to be approximately 1,200 ‘core’ zoos in the world. These are so categorised because they are organised as members of recognised zoo associations, of which there are currently 50 throughout the world (Olney & Fisken, 2003). The largest of these zoo associations and the regions they cover are shown in Box 3.3.

Box 3.3: Zoo associations around the world

The 1,200 'core' zoos of the world are organized in national and /or regional zoo associations. These associations include:

Africa

Regional association for all of Africa: PAAZAB (Pan African Association of Zoological Gardens, Aquaria and Botanical Gardens)

Asia

National associations in: China, India, Indonesia, Japan, Pakistan, Thailand

Regional association for South East Asia: SEAZA (South East Asian Zoo Association)

Regional association for South Asia: SAZARC (South Asia Association of Zoos)

Australasia

Regional association for Australia and New Zealand: ARAZPA (Australasian Regional association of Zoological Parks and Aquaria)

Europe

National associations in: Austria, Czechia/Slovakia, Denmark, France, Germany, Hungary, Italy, Netherlands, Poland, Spain, Sweden, Switzerland, United Kingdom

Regional association for all of Europe: EAZA (European Association of Zoos and Aquaria)

Latin America

National associations in: Brazil, Colombia, Guatemala, Mexico, Venezuela

Regional association for Meso America: AMAZOO (Association of Meso American Zoos)

North America

National association in: Canada

Regional association for the subcontinent: AZA (American Zoo and Aquarium Association)

Source: IUDZG/CBSG (IUCN/SSC), 1993; J. Wilken, ARAZPA, pers. comm., 7/7/03

The umbrella organisation for the world zoo community is the World Association of Zoos and Aquaria (WAZA), with about 200 institutional members, while another 1000 are linked through their membership in a regional or national Association member. All members of the WAZA Network are obliged to comply with its Code of Ethics and Animal Welfare. They agree to work together at a global level to build cooperative approaches to common needs and issues, to share information and knowledge, and represent the zoo community in other international bodies such as the World Conservation Union (IUCN). Consequently, the most accurate and complete information and data about the zoos of the world come from these 1200 'core' zoos.

Operating zoos is acknowledged as being a highly expensive business (van Oudstoorn, 1987; Wade, 1994), and the closer they come to the concept of a conservation centre, the costlier they become (Hediger, 1969). Consequently, zoos often have difficulty in generating the necessary annual revenue from visitor admissions to cover the substantial costs of housing and maintaining and staffing their collection (Turley, 1999a). Zoos in the UK that closed down during the 1990s did so largely because of a lack of sufficient visitors and revenue (British Broadcasting Corporation (BBC) Education, 1994). Even for well-established and popular zoos, levels of visitation (and hence revenue) can vary from year to year in response to a number of factors over which the zoo has little or no control (Mason, 2000). These may include the state of the economy (particularly the international tourism market), weather conditions (especially during school holidays) and increased competition from other tourist attractions. In addition, other extraordinary factors can also impinge severely on a zoo's ability to generate revenue and balance its budget. For instance, the Foot and Mouth Disease outbreak in the UK in 2001 cost their zoo industry AUD$20 million (M. Robinson, pers. comm.) and was particularly severe in its effect on zoos that had to close their gates for its duration.

Consequently, in addition to gate receipts, zoos have increasingly used a number of other means of generating additional income (Turley, 1999a; Hancocks, 2001; Mazur, 2001). These include attracting sponsorship from local, national and international companies, membership schemes and season tickets (often through 'Friends of the Zoo' societies), animal adoptions and sponsorships and retailing and catering activities. More recently, many zoos have introduced after-hours or 'value-added' events to increase admissions incomes, such as after-hours and 'behind-the-scenes' tours, concerts, corporate evenings and private functions (Mazur, 2001). This is a trend which developed in the USA but which is now increasingly seen in zoos in other parts of the world (Turley, 1999a).

Another recent development that has impacted upon the zoo industry and its activities has been the trend towards 'economic rationalism'. This philosophy asserts that a prosperous economy depends on efficiency, and the greatest efficiency occurs when open competition in a free market determines outcomes (Mazur, 2001). The effect on zoos has been twofold. Firstly, public zoos have received less and less government support. These institutions are being told that they need to become more efficient and economically viable by reducing their dependence on 'government handouts' and more fully developing their commercial potential (Mazur, 2001). Secondly, the managerial values of private industry have been increasingly forced upon zoos. This has meant that the majority of new senior staff positions created for zoos have been in the fields of marketing, development and management (Wagner, 1987), and that these vacancies tend to be filled by business professionals rather than people with an animal or zoo background. This, according to Mazur (2001), has signalled a shift in values beyond simply occupational changes. Zoo leaders, she claims, are now more likely to see their organisation first as a business that must operate 'efficiently', and therefore to apply performance criteria, such as budgeting measures that assess accountability via cost – answerability and economic efficiency.

As Chris Larcombe, former Chief Executive Officer of the Zoological Board of Victoria and Director of Melbourne Zoo, explained at an Australasian regional zoo conference in 1995: 'We must come to terms with the increasing financial pressures on the operations of our properties. What we are talking about here is a sustainable base of economic support and leveraging of resources in order to continue to develop our properties…. But we will only be able to continue to deliver this potential if we have organisations of sustainable financial viability' (Larcombe, 1995, p.122).

However, while the desire to increase revenue, efficiency and sustainability is both necessary and desirable, the challenge for zoos is in how to achieve it without losing sight of their fundamental objectives (Hancocks, 2001). As van Linge (1992, p.117) says, 'animal management must never be made subordinate to the pleasure of the visitors'.

The market

Zoos are a popular and traditional part of wildlife tourism. In many countries, zoos are amongst the most popular destinations for a day out (van Linge, 1992). For instance Mexico City zoo receives more than 12 million visitors per year, Beijing 11 million, Moscow 3.5 million, San Diego 3.3 million and Tokyo 1.5 million. The nine major Dutch zoos are visited yearly by a combined total of approximately 6 million people (van Linge, 1992), with the majority being local residents.

The total number of people visiting zoos annually is even harder to estimate than the total number of zoos, and can only realistically be estimated for the 1,200 core zoos mentioned above; at least six hundred million visits are made to these zoos every year (IUDZG/CBBG (IUCN/SSC), 1993). This represents approximately ten per cent of the world's population, and provides a reasonable indication of the popularity and size of the captive wildlife market. In the USA, for instance, zoo attendances exceed all professional sports events combined (Hancocks, 2001), with almost 50% of the total population visiting zoos on an annual basis (IUDZG/CBBG (IUCN/SSC), 1993), and more than 90% of Americans having been at least once in their lifetime (Robinson, 1988). Chapter 9 discusses further information about zoo visitors.

The popularity of zoos across the world is shown in Table 3.1. Here the annual attendances recorded by regional and national zoo organisations and by the International Zoo Yearbook are given. This data comes from the 1,200 'core' zoos from Box 3.3.

Table 3.1: Zoo attendances around the world

Continent	Total (millions)
Africa	15
Asia	308
Australasia	6
Europe	125
Latin America	61
America	106
Estimated World Total	**621 million**

Source: IUDZG/CBSG (IUCN/SSC), 1993

Yet in spite of this popularity, zoos find themselves within an increasingly competitive market servicing an audience that is becoming more discerning (Hunter-Jones and Hayward, 1998). The past 20 years have seen unprecedented growth in the number of stand-alone visitor attractions, such as museums, heritage properties, farm parks (which display domestic animals), and theme parks. In many countries the number has more than doubled in this period (Stevens, 2000), and has included a wide range of innovative leisure products. Consequently, Hunter-Jones and Hayward (1998) suggest that the attractions market is in serious danger of becoming oversupplied.

Evidence suggests that in real terms, demand for traditional attractions such as zoos is actually now in decline (Stevens, 2000). For instance, in the U.K. visits to a constant sample of zoos rose by just 4% between 1976 and 1997, while during the same period visits to all other attractions rose by 34%. (British Tourism Authority (BTA) / English Tourist Board (ETB), 1998). A similar stagnation of visitor numbers has been found in Australian zoos (Tribe, 2001). Table 3.2, compares the annual attendance for a number of selected zoos for 1978 and 1998.

Table 3.2: Annual attendance for a number of selected zoos for 1978 and 1998

Zoo	1978 Attendance*	1998 Attendance**
Copenhagen, Denmark	907,139	1,056,907
Parc Zoologique de Paris, France	1,023,457	726,725
London Zoo, U.K.	1,338,000	994,500
Moscow Zoo, Russia	2,167,930	1,454,996
San Diego Zoo, U.S.A.	3,100,000	1,828,486
Chicago Zoo (Brookfield), U.S.A.	1,696,836	2,212.508
Bombay Zoo, India	3,875,000	1,993,911
Tokyo Zoo, Japan	7,217,350	3,175,908
Johannesburg Zoo, South Africa	481,903	430,000
Melbourne Zoo, Australia	728,356	951,772

* Source: Olney, 1982; **Source: Olney & Fisken, 2003

A number of reasons for this wavering zoo popularity have been given. These include demographic changes resulting in an aging population, not traditionally the main audience of zoos (Block, 1991), changes in numbers of leisure consumption (Stevens, 2000), poor marketing techniques employed by zoos (Hutchins and Conway, 1995) limited rejuvenation of the role of the zoo (Block, 1991), lack of funding (Hutchins and Conway, 1995) and issues of animal welfare (Brown, 1992). However, Hunter-Jones and Hayward (1998) believe that the overriding reason is simply that zoos are now part of an increasingly competitive leisure market. To compete effectively, they argue, zoos must appreciate their own place in the tourism market and strive to gain a better understanding of the motivations and attitudes of their visitors.

The zoo in the community

Zoos can play an important role in the life of their local community. Beyond their economic and conservation contributions, zoos can also reflect and participate in the culture of a society. Mullan and Marvin (1999) have discussed this aspect of zoos in some detail in their book ‘Zoo Culture’. They maintain that zoos have many of the same elements as art galleries and museums, particularly through their history and their place in our cultural traditions. However, they also argue that in one important aspect zoos are different: whereas art galleries and museums entered the realm of high culture, zoos have become essentially popular because they do not intimidate people; visitors can enjoy themselves without having to possess much knowledge about the animals they are viewing. This has led not just to a higher visitation rate, but also to a perception of zoos as being more ‘entertaining’, friendlier and more likely to attract both public scrutiny and support.

Consistent with this are the results of studies that have examined who visit zoos. Studies from both the US and from Europe have found that visiting zoos is a social experience, with few people visiting alone. (English Tourist Board; 1983, Andereck and Caldwell, 1994; Rajack and Warren, 1996; Holzer et al, 1998; Turley, 1999b, 2001). This is supported by similar findings in Australia (Tribe, 2003). The great majority of respondents in all these studies indicated that they were visiting with either close friends or relatives, children were often included and most tended to be frequent visitors. Less clear are the attitudes of these people both to their own visit, and to the role of the modern zoo.

The attitudes of zoo visitors

Despite the importance of zoos as tourist attractions, until recently there has been little research to investigate the nature, attitudes and motivations of zoo visitors. (Mason, 2000). The nature of the zoo as a recreational setting and the preference of visitors to be in social groups would imply that enjoyment is a primary motivating factor, and this is supported by a number of studies across many countries. For instance in a survey of visitors at Woodland Park Zoo Seattle, Fielder and Wheeler (1985) found that nearly three quarters considered the zoo to be about entertainment with 92 per cent visiting as a family or social group. Table 3.3 summarizes the results from four studies in the U.S., the U.K. and Australia that examined why people visited zoos in those countries.

Table 3.3: The motivations of zoo visitors

Country	Reason for Visiting	%	Reference
USA	Education for children	38	Kellert (1979)
	To do something with family/friends	26	
	Personally fascinated by wild animals	25	
	Animals are pretty to look at	11	
USA	Education/Relational	56	Andereck & Caldwell (1994)
	Education	21	
	Recreation/Novelty	11	
	Photography	11	
UK	To have a day out	64	English Tourist Board (1983)
	To treat the children	53	
	To watch animals and birds	22	
	For entertainment	13	
	For a change	13	
	To learn about animals and birds	7	
UK	For fun/Entertainment	39	Rajack & Warren (1996)
	Visit with friends	36	
	To see rare animals	5	
	Education	4	
Australia	Entertainment	63	Ford (1998)
	Education	37	
Australia	Spend time with friends and family	77	Tribe (2003)
	Be in a pleasant outdoor space	54	
	Learn about the animals	33	
	Escape pressures of daily life	31	
	Learn about wildlife conservation	25	

Note: in some studies, more than one option could be chosen. Hence percentages do not sum to 100%.

All these studies agree that while people visit zoos for a number of different reasons, paramount amongst them seems to be recreation (Woods, 1998). In addition, Turley (1999b, 2001) has found children to be particularly significant in the decision: they both facilitate and in their absence inhibit, zoo visiting, with their presence increasing the enjoyment of the visit. Similar findings have come from the U.S. (Holzer et al, 1998) where it was also found that adults who visited zoos as children were more likely to revisit later in life, and to show them greater commitment and support.

However, while such research may indicate why people like zoos, the reasons for not visiting have been seldom considered (Hunter-Jones and Hayward, 1998). A major concern still appears to be the perception of captivity and captive conditions (Mason,

2000). For instance, Turley (1999b) conducted a small national survey of latent visitors to U.K. zoos in which 40% associated traditional zoos with bars and unnatural conditions, whilst over one third (35%) indicated that not liking to see animals in captivity was a reason for not visiting.

Perhaps of even greater significance for zoo managers is the fact that conservation does not appear to be a major motivation for zoo visitors. This was shown consistently in the studies summarized in Box 5, and is supported by Turley (1999b) who found that of the three key objectives pursued by zoos (recreation, education and conservation), conservation had the least influence on the desire to visit. However, although zoo visitors appear to be influenced mainly by motives of enjoyment, many also believe that zoos do have a key role to play in conservation and education. Of those questioned at Woodland Park, Seattle, 68% claimed that they considered the purpose of the zoo to be primarily educational (Fielder and Wheeler, 1985). This is supported by the studies of Australian zoos by Mazur (1995) and Ford (1995) who also found that the great majority of visitors expected to learn about environmental issues at the zoo. The results of three recent studies that have examined public perceptions of the roles of zoos are summarized in Table 3.4.

Table 3.4: Visitor perceptions of the roles of zoos

Country	Role	% (Ranked "Very Important")	Reference
UK	Conservation	74	Rajack & Warren (1996)
	Research	49	
	Education	42	
	Entertainment	7	
Australia	Education	68	Ford (1998)
	Research	23	
	Entertainment	22	
	Display	21	
Australia	Educate public	61	Tribe (2003)
	Breed endangered species	52	
	Educate school children	43	
	Support wildlife conservation	41	
	Provide a pleasant day out	39	
	Research	17	
	Entertainment	8	

Note: More than one option could be chosen and hence percentages do not equal 100.

Thus zoos seem to be faced with a contradictory situation: people visit them mainly for recreation, but they believe that their main role is actually in conservation. This dilemma has important implications for zoo management in their search for more revenue: can conservation attract visitors? Will it make money for the zoo, or merely remain a net cost? Turley (1999a) suggests that conservation may provide people with a justification for visiting the zoo, and therefore does influence attendance level indirectly. However, there is no evidence to support this yet. Conversely, as Mazur (2001) points out, it is not known if visitors will actually go to a zoo less if more conservation programs are implemented and promoted.

Such unanswered questions point to a need for more research in this area. So far most has been short term and marketing based (Mazur, 2001), and there has been little deeper evaluation of visitor behaviour. This view is supported by Mason (2000) who believes that there is a great deal still to be understood about the nature of zoos as

tourist attractions, the characteristics of zoo visitors and visitor satisfaction. In particular their interpretation and understanding of the zoos' conservation, educational, scientific and entertainment roles need to be addressed as a part of this tourism research.

For an industry committed to supporting conservation, it is clear that more information is needed about the role of conservation in supporting the industry.

The wildlife

The total number of captive animals in the world's 1200 'core' zoos is estimated to be one million (IUDZG/CBSG (IUCN/SSC), 1993), with the majority comprising 3,000 vertebrate species. Thus, while the majority displays a broad range of species and includes mammals, birds and reptiles, some zoos specialize in the fauna of a particular region or habitat (such as marine parks or desert zoos) and others display only one or two classes of animal (such as bird parks or primate sanctuaries).

For any one zoo, the choice of what species to hold may depend on many factors including:

- Zoo legislation which may restrict what a zoo may hold, both for exotic and native species
- The cost of maintaining a particular species
- The conservation status of a species and the zoo's desire to contribute to a particular captive breeding program or conservation activity
- The marketability of the species in terms of its ability to attract visitors.
- The zoo's own stocking policy, or master plan for future development and the availability of suitable enclosure space, facilities and relevant expertise
- The availability of a species from another captive facility that may preclude a zoo from obtaining it (C. Larcombe, ZPGB VIC, pers. comm., 28/11/99).

The final collection may then be a mixture of common and endangered species, and may ultimately represent a compromise between what species the zoo would ideally like to exhibit, and the species that are actually available and appropriate.

The primary attraction of zoos is of course, their animals (Woods, 1998). However, while they are still places of recreation and entertainment, changes in public expectations and the zoo's own objectives mean that today there is far more scrutiny of the way in which their animals are being managed and utilised. In particular, this involves consideration of two important and related factors: the ethics of zoos and the role of zoos in conservation.

The ethics of zoos

Although zoos are popular places to visit, the relationship between the zoo and its public can still present problems. Not only do some people believe that zoos are basically cruel and evil places (Weir, 1989), but visitors often express negative attitudes towards the animals' captive environments and the way in which they are perceived to be treated (Nimon, 1990). Furthermore, Wolf and Tyitz (1981) found that most zoo visitors were primarily concerned for the comfort of the animals, and for their health and happiness. Such attitudes may then be reflected in zoo attendance levels. For instance Brown (1992), believes that the failure of UK zoos to attract more visitors through the 1980's was in part due to a growing concern for animal welfare.

Despite their improvements in captive animal management and adoption of conservation objectives, zoos are still seen by some as being superficial, expensive, unnecessary and therefore indefensible. For instance, the Australian and New Zealand Federation of Animal Societies is opposed to keeping wild animals in captivity, believing that zoos in their present form provide stressful conditions and are unnecessary (ANZFAS, 1996). Similarly, the Born Free Foundation continues to campaign strongly in the UK and Europe for the abolition of 'the confinement of wild animals for human entertainment' (Hewitt, 2000), while in the U.S., organisations such as the Society for the Prevention of Cruelty to Animals (SPCA) and People for the Ethical Treatment of Animals (PETA) provide a consistent and vocal voice for the anti-zoo lobby (Baatey and Hardouin-Fugier, 2002).

Others are simply sceptical of the conservation claims of zoos, believing them to be merely window dressing. As Scott (2001) writes: 'Despite their protestations to the contrary, zoos are still menageries. The only difference is that their Public Relations are more efficient and some of them do a little serious captive breeding and research on the side.' In addition, according to Hutchins (2003) there is likely to be a continued growth in animal welfare and rights organizations, as well as concern by the public for the welfare of animals in captivity.

Thus zoos actually provoke two ethical considerations. Firstly some people hold the belief that because animals in the wild live in an environment of great complexity with much spatial and temporal variation, no captive environment can be appropriate or suitable (ANZFAS, 1996, Hancocks, 2001). To these people zoos are philosophically unacceptable, and cannot be justified on any grounds. As Hanson (2002) explains, this is an elaboration of the idea that 'wild animals ought to roam free', a statement about the authentic state of wilderness. Secondly, the history of zoos as menageries of animals in cramped conditions and maintained largely for human amusement has left a lasting impression on some people of poor animal welfare (Turley, 1999a). As Stevens and McAlister (2003, p. 97) explain: 'It is quite apparent that, for the most part until fairly recent times, the way in which wild animals were kept is something of which humankind should be embarrassed and ashamed.'

This combined with the fact that they are constantly in the public gaze, has brought zoos under close scrutiny over the past 20 years. In July 1994, the World Society for the Protection of Animals (WPSA) and the Born Free Foundation (BFF) issued The Zoo Inquiry (WPSA, 1994). Whilst anti-zoo movements have been alive and well in many parts of the world and particularly North America, because WPSA and BFF are UK-based, the major concentration of argument centred on UK and Irish zoos. Although critical of zoos, this document was significant in that it also made some constructive recommendations regarding animal welfare standards, and the role of zoos in conservation.

In the ten years since this report, many of these recommendations have actually been adopted by the zoo industry, at least in developed countries. This has come about through a combination of zoo legislation, and codes of practice. Zoo Legislation that requires zoos to be licensed and inspected now exists in most developed and many developing countries around the world (Cooper, 2003). Although their content varies from country to country and the terminology and its use are not uniform, there are some basic provisions that are common to all. These are outlined in Box 3.4.

Box 3.4: The basic elements and typical provisions of zoo legislation

Authorization is required which may be in the form of a permit or licence of registration.

Licence procedures then require zoos to provide a wide range of information and records about their animals and the facilities provided for them. This allows the licensing authority to assess the resources available for animals, staff and visitors, and the compliance with the law and relevant standards. The information is usually verified by a zoo inspection, and licences have to be renewed annually.

Standards are used to supplement zoo legislation, and comprise requirements for the management of a zoo and the care of its animals. They do not usually appear in the zoo legislation but may be made under it and are therefore more easily changed and updated. They may include provisions for: animal accommodation and facilities; special needs of particular species and displays; animal welfare; animal care and nutrition; veterinary attention and facilities; hygiene; emergency procedures; staff safety; training and facilities; visitor safety and facilities (Macdonald and Charlton, 2000).

Monitoring via inspection of zoo premises is then conducted to ensure that the provisions of the licence and standards are being met.

Enforcement of these provisions is effected through withdrawal of the zoo licence and penalties for non-compliance.

Source: Cooper (2003)

Some of the most recent legislation now requires zoos to justify their existence. For instance a European Union (E. U.) Directive requires zoos in member countries to have conservation objectives, and to address the behavioural needs of its animals (E.U, 1999). This Directive also provides for the partial closure of a zoo in the event of its failure to comply with conditions imposed in its licence.

Codes of Practice represent a form of industry self-regulation and have been developed over the past decade by a number of regional zoo associations to try to raise the standards of animal care and welfare in their member institutions. In some regions these codes are enforced by the terms of membership of the association itself, with expulsion as the penalty for non-compliance, while in others they are only morally enforced using self-regulation. More recently, these codes have been supplemented by a Code of Ethics developed by the World Association of Zoos and Aquaria (WAZA, 1999). Amongst other things, WAZA demands that members assist in achieving the conservation and survival of species and promote the interests of wildlife conservation and animal welfare. Members are further asked to act in accordance with all local, national and international laws, and to strive for the highest standards of operations. Stevens and McAlister (2003) in their review of the development of the WAZA Code of Ethics have recognized that writing it proved difficult. It had to accommodate both established zoos in developed countries, which required that the proposed code was sufficiently rigorous, and newer zoos in developing regions of the world, which had to be able to attain the requirements of the document. Nevertheless the authors (p. 101) also urge the zoo industry to treat the code seriously: 'It behoves all those involved in the zoo profession to adhere to a strict code of ethics. To do otherwise is to give more ammunition to those who say that zoos are a 'nineteenth century anachronism'.

The role of zoos in conservation

Modern zoos regard conservation as being one of their key objectives, and regard themselves as being 'conservation centres' rather than simply collections of captive wild animals. The actions required by them to dedicate their potential to conservation have been defined in the WZCS (IUDZG/CBSG (IUCN/SCC), 1993), while the Zoo Futures 2005 paper (WZO, 1995) guides zoos in implementing it. These documents

are currently being reviewed and updated by the WAZA, and are expected to be republished in 2004 (J. Wilken, pers. comm.).

The contribution of zoos to conservation is discussed in more detail in Chapter 6 of this book. However, their conservation actions can be summarised here as including:

- *Ex situ* Conservation Activities (the conservation of biological diversity outside their natural habitat) such as the maintenance of sustainable captive populations through the genetic management and captive breeding of their collections, conservation education (formal and informal), and research.
- *In situ* Conservation Activities particularly in developing countries, such as endangered species rescue, habitat protection and restoration, and the reintroduction to the wild of captive bred animals. Perhaps the best example of the contribution of an individual institution to *in situ* conservation is Jersey Zoo, as summarised in Box 3.5.

Box 3.5: Jersey Zoo

Mission Statement:

To save species from extinction.

History:

Founded in 1959 by renowned author and naturalist Gerald Durrell on a 32-acre site on the British Channel Island of Jersey.

Its early precarious financial position led in 1963 to the establishment of the Jersey Wildlife Preservation Trust to run the zoo. This is now called the Durrell Wildlife Conservation Trust (DWCT) and is a registered charity.

This Trust also runs the International Training Centre (ITC), for Conservation and Captive Breeding of Endangered Species, and has established sister trusts in the USA and Canada.

Market:

Attracts around 180,000 visitors annually, and has a turnover of more than £5 million.

60% of visitors are from the UK, with an average age of 54.

Zoo attendances have fallen 46% over the past 10 years due largely to Jersey becoming less popular with British and European tourists: their average age has increased, their length of stay on the island has decreased (from 14 to 5 nights), and 60% are now on package holidays.

Consequently, the zoo runs at a loss, with almost half its operating costs being met from donations and bequests.

Increasingly, money for conservation initiatives is raised through the trusts and their 12,000 members.

Display:

Jersey Zoo has become a captive breeding centre for some of the world's most endangered species. Hence the collection focuses on wildlife that is endangered or that is involved in an *in situ* conservation project.

However, in recognition of the need to maintain visitation levels, the Zoo also has a number of 'box office' species, including gorillas, meerkats and flamingos. Similarly, they display species which are common, but which can serve to advertise an *in situ* field project to which the Trust is contributing.

Enclosures are designed to be naturalistic to allow animals to display their full range of natural behaviours and hence to encourage them to breed and maintain sustainable captive populations.

Jersey Zoo has eschewed the introduction of entertainments such as funfairs or children's

rides.

Conservation:

DWPT is extensively involved in a wide range of both *ex situ* and *in situ* conservation activities.

At Jersey, they have the endangered species breeding centre, and the International Training Centre, to which conservation professionals from around the world are recruited for training to ensure ongoing protection of species and habitats.

Internationally, the Trust is involved in a large number of collaborative *in situ* projects particularly in Mauritius, Madagascar, India, the Caribbean and Brazil. It has identified for itself a species-led niche within the international zoo and conservation community, with a strategy of developing viable conservation partnerships with local people and their governments,

The budget for *in situ* programmes is more than £1 million per year, which represents 23% of the gross income of the zoo and the Trust.

Sources: Bell (2001); DWCT (2001); J. Mallison, DWCT, pers. comm., 19/6/2002

While zoos invest considerable amounts of money in the pursuit of their conservation objectives, most have great difficulty finding additional resources to become involved in conservation programs (Mitchell, 1994). As Mallinson (2001) points out, in recent years the increase in personal mobility and choice of attractions for a day out have seen many zoos experience falling attendances which, in turn has affected their capacity to contribute to conservation.

To help combat this, Larcombe (1995) believes that zoos must not only contribute to conservation, but must also be seen to be doing so. As Bartos and Kelly (1998 p. 155) argue, 'a summary of measurable contributions by zoos in the areas of education, conservation, research and tourism is of critical importance in demonstrating their contribution to the whole community'. However, such suggestions assume that zoo visitors are interested in wildlife conservation, and will visit zoos to learn about it. Unfortunately there is little evidence to support this. As Mason (2000) points out, there is an urgent need for more zoo research to determine more clearly not only what the visitors want, but also how zoos can better combine their role in conservation with their commercial imperative.

Towards sustainable zoo tourism

Zoos are a popular and important part of wildlife tourism, and they can continue to capitalize on this popularity through the upgrade of existing facilities and the development of new displays and exhibits. However, rather than merely improving what they already have and do, it is likely that zoos of the future will require a more radical shift in the way that their managers, staff, and visitors, see them.

As Mazur and Clark (1996, p.19) conclude: 'While the zoo community should be congratulated for their efforts at modernising their institutions, increasing environmental degradation will ensure continued societal demands for more fundamental changes in zoos than what have transpired so far'. The opportunity and challenge for zoos today is to transform themselves from traditional static animal collections into true conservation centres, where their message is delivered more effectively through a combination of both entertainment and education (Conway, 1999). As Mazur and Clark (1996) point out, this will involve developing and implementing appropriate policies, economic and organisational procedures, and nurturing and encouraging zoo personnel in the achievement of change.

Such a zoo will not be bound by its existing physical boundaries and activities, but will seek to entertain, involve and educate their visitors. In so doing, it will also address and balance its two potentially conflicting obstacles: commercial viability and ethical credibility (Mitchell, 1994).

Commercial viability

In order to compete effectively and improve their revenue base, zoos must develop and implement strong and innovative marketing strategies that provide a solid financial base while also supporting their conservation, education and scientific goals (Hutchins and Smith, 2003). This will involve a combination of the following activities:

- Gaining a better understanding of zoo visitor attitudes, expectations and levels of satisfaction (Rabb, 1999; Turley, 1999b; van der Ploeg, 1997), and a willingness to broaden their appeal and target other visitor groups such as the expanding seniors market (Turley, 1999b; 2001).
- Greater integration and development of other zoo facilities, such as the restaurant and souvenir shop. Traditionally, these have been seen as an adjunct to the zoo, secondary to the animal displays. However, they can be upgraded to become destinations in their own right, and hence another reason for revisiting the zoo. Changing patterns of leisure behaviour over the past ten years have resulted in the growth and demand for leisure shopping, eating and drinking as essential components of a day trip. According to Stevens (2000), shopping for pleasure has now become one of the most important out-of-home activities in the UK, while in the US; there is a close relationship between shopping and visiting attractions among overseas visitors.
- The development of more collaborative links and strategic alliances with other components of both business and government. In this way, zoos are more likely to develop new marketing opportunities, raise funding for their capital works projects, and contribute to and promote their contribution to wildlife conservation (Tribe, 2001).
- Zoos should begin to position themselves more strongly with the donor community in order to take advantage of unprecedented current levels of corporate and personal charitable giving (Hutchins and Smith 2003). However, to do so effectively, they must also be more businesslike in their operations, including tighter budgeting and financial reporting.
- Zoos can enhance the experience of their visitors by continuing to develop new and innovative exhibits (Middleton, 2001). As van Linghe (1992) explains, zoos can no longer rely solely on the presence of exotic animals to put over their educational message or to attract their share of visitors. Instead, zoos should seek to incorporate more naturalistic settings for their animals with interactive and interpretive displays and presentations that involve and excite the visitors (Hunter-Jones and Hayward, 1998). There may also be opportunities for themed displays, promoting a particular aspect of wildlife and conservation. Possibly these will be linked to other events occurring outside the zoo, either natural or human-made (Tribe, 2001). These displays can be constantly changing, creating an incentive for revisits to the zoo.
- Zoos can further bridge the gap between captive and free-range wildlife by developing greater links with *in situ* conservation activities and ecotourism

(Tribe, 2001). In fact, Mason (2000) argues that zoos can make a significant contribution within the ecotourism market by acting as a 'taster', providing the stimulus for visitors to make lengthy journeys to more distant locations to see wildlife in their natural settings.

Melbourne Zoo, a traditional, city zoo, has recently opened a new elephant exhibit that incorporates many of these new features. It is outlined in Box 3.6.

Box 3.6: Melbourne Zoo

Mission:

Our zoos will be world-leading centres for wildlife experience, education, conservation and research – on-site, off-site and on-line.

History:

Founded in 1857 it is the oldest zoo in Australia, and occupies a 50-acre site in Royal Park, Melbourne.

It was originally the Acclimatisation Society of Victoria, whose aim was to acclimatise and release useful and ornamental animals into the colony of Australia.

It is now administered by the Zoological Board of Victoria (ZBV), a statutory authority of the State Government, which also runs Healesville Sanctuary and Victoria's Open Range Zoo at Werribee.

Market:

Attracts around one million visitors annually, and has a turnover of more than A$20 million.

99% of visitors are from Australia, with 95% from Victoria.

Attendances peaked in 1989 at 1.2 million. Since then they have been consistently around 900,000 until 2003 when they again topped 1 million.

The ZBV receives an annual grant from the Victorian state government of more than A$9 million. to assist with operating its three zoos. In addition, in 2002 it received a one-off, three-year grant of A$32 million for capital development across their three properties.

Display:

The collection comprises native and exotic wildlife, including both endangered and common species.

Melbourne Zoo has chosen a bioclimatic display strategy, in which animals and plants from a particular bioclimatic region of the world are displayed in one area (e.g. rainforest, savannah or eucalypt woodland). This contrasts with the traditional approach of all primates in one area, all reptiles in another etc.

The most recent development is Trail of the Elephants, opened in March 2003. This is a large, interactive exhibit focussing on Asian elephants, but which also includes an Asian village on the edge the tropical rainforest. . It occupies 10% of the total zoo site. The aim is to inform visitors not only about elephants but also about the environment in which they are found and the conflicts surrounding their conservation. It includes interactive displays, keeper talks, off-limits viewing, cultural displays, cafe, function room and merchandise outlets. Visitors can donate directly to *in situ* elephant conservation projects. In its first year it has increased zoo attendances by 26%.

Conservation:

Melbourne Zoo's conservation programs are focussed on Australian and South-east Asian species. This includes both *ex situ* (captive breeding and education) and *in situ* programs (reintroductions and habitat protection). More recently they have established a relationship with Flora and Fauna International (FFI) to support community-based programs in South-East Asia such as providing fresh water wells for villages and reducing competition between people and elephants.

It has a large education section with up to 10 teachers seeing more than 120,000 children per year.

Sources: ZBV (2002), J. Henke, Melb. Zoo, pers. comm., 25/9/03

Ethical credibility

Zoos are now seeking credibility as scientific institutions devoted to conservation and education. Yet this must still be achieved against a backdrop of hostility from the anti-zoo lobby (Turley, 1999a). As Luoma (1987) explains, zoos must confront the suspicion that all the talk of conservation is no more than window dressing to subdue criticism.

Turley (1999a) sees acceptance of their conservation role as vital if zoos are to attain credible cultural status, and that this will be an important part of their sustainability. To achieve it they must be seen as proponents of good animal welfare as well as wildlife conservation. Appropriate actions may include:

- They must adopt, embrace and promote world-class standards of animal care and husbandry by ensuring that both the physical and psychological needs of their animals are fully met (Hutchins, 2001; 2003).
- Exhibits should be designed which are not only aesthetically pleasing to the public but also replicate critical aspects of their natural environment, thus allowing them to display their full range of normal behaviours.
- Expert veterinary care and nutrition should be provided, and zoos will participate in and follow the recommendations of cooperative breeding programs.
- Zoos should also be committed to strong conservation objectives through a broad range of activities. These may include public education, scientific research, development of relevant technologies, professional training, conservation planning and captive breeding for reintroduction (Hutchins and Smith, 2003). However, as Hutchins (2003) points out, simply sustaining captive populations of wild animals, whether they are endangered or not, should not by itself be considered conservation. Zoos of the future will need to establish stronger links with *in situ* conservation projects and organisations, and so become more involved with activities such as ecological restoration, the direct support of national parks and the reintroduction and post-release monitoring of wildlife to these areas (Mallinson, 1991, 2003; Conway, 1999; Hutchins, 1999).
- Finally, zoos must endeavour to use their strong public relations and educational skills to communicate clearly their mission, goals and achievements to the public and to relevant key decision makers.

In this way, zoos can balance the twin challenges of commerce and ethics, and in so doing develop a stronger revenue base, more effectively achieve their conservation objectives and attain credible, cultural status in the community. Zoo tourism may then become truly sustainable.

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Chapter 4

Hunting and Fishing Tourism

Johannes Bauer and Alexander Herr

Introduction

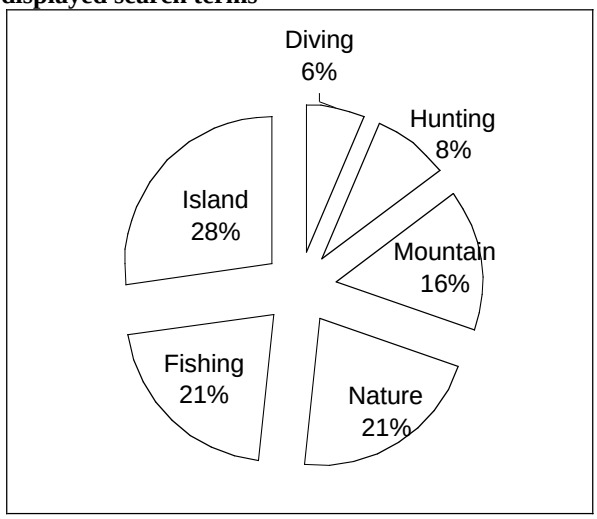
As road networks and industrial agriculture expand, and people become more affluent, wildlife resources are diminishing, forcing hunters and fishers to travel further for their quarry, whether it is to the next lake or forest, or to the other side of the globe. The increasing urbanisation of society, combined with the extensive range of quarry, has created a demand and supply situation in which various strategies have been pursued to provide clients with their desired experience, and to derive profit for the fishing and hunting industry.

The main target species for hunting tourism include larger ungulates (mostly cervids and bovids), rodents (rabbits, marmosets), and waterfowl (ducks, geese), but also incorporate carnivorous species such as bears, wolves, foxes, felids (wild felines), mustelids (weasels), and crocodiles. Fishing focuses on a wide range of marine/estuarine fish, molluscs, crustaceans, and a variety of freshwater species in rivers and lakes. Not all hunting/fishing falls under tourism, but much of it incorporates the following defining elements of tourism:

- Travel to and from a particular destination
- The presence of a tourism service industry (outfitters, tour guides, hunting farms)
- The exchange of money for services
- Overnight, to several months, stays at destinations
- A service industry
- Aspects of leisure and recreation

There is a wide range of products available, varying between over US$100,000 for a hunting trip to a few dollars for a fishing license in Australia. How important is the industry worldwide, how many people engage in it and what is the total economic value of the hunting market? We analysed a number of websites, accessed through Google (www.google.com) for parts of this chapter. This was conducted in order to gain at least a coarse measure of tourism-related hunting and fishing activities. If one assumes that particular tourism sectors, including wildlife tourism, are represented equally on the web, and in proportion to the size of the actual industry, then it is possible to gain an understanding of their relative size. Hunting and fishing account for 29 per cent of all the websites connected with tourism (a total of approximately six million hits). In almost one third of cases, the concept of being immersed in nature was associated with hunting or fishing (Figure 4.1).

Figure 4.1: Proportion of Google hits (total approx. 6 million hits) in relation to tourism and the displayed search terms



International hunting tourism, as an industry, has developed in the wake of the European expansion. The affluent British gentleman-adventurer, often also a naturalist, travelled to remote places, to explore first-hand the wonders of the tropics, the confronting dangers of a tiger or elephant hunt, the thrill of a safari, or the quiet pastime of the insect collector. It is not surprising that such a person would take home a trophy, such as skins, horns, teeth, dried penises, skulls or tails, in order to verify their adventures. Although, in later years, photographic evidence could have replaced this method of verification, tiger skins and elephant tusks had, by that time, become such an essential part of a residential display that its waste would have been unthinkable. Much of this would have occurred during the 19th Century in Africa and Asia, and thus international trophy hunting was born.

Trophy hunting was never restricted to the European gentry. In the 1960s, for example, the King of Bhutan, a Buddhist, succumbed to a heart attack while enjoying a hunting-safari in the heart of Africa. In 2003, there is a wide, and increasing, range of potential destinations for hunters and fishers depending on their interests in prey and costs. Hofer et al., (2002) distinguished between the demand and supply countries. There are fishers and hunters in all parts of the world, however there are distinct places where the supply outweighs the demand. It is to these destinations that most fishers and hunters travel.

Hunting and fishing, including in their tourism form, are important land uses and are a part of the essential cultural heritage for many societies (Bauer and Giles, 2002; Roe et al., 2002; Robinson and Bodmer, 1999; Pearce, 1995). In Europe hunting remains of great cultural significance (Ermala, 1982; Kalchreuter, 1984), as it does in many other parts of the world (eg. Africa and North America), particularly for indigenous people. The hunting language in Germany and Scandinavia forms an essential part of the Germanic cultural heritage; even music has its own hunting history.

Although not required for subsistence, hunting and fishing for recreation play an important role in the economy of western countries (Kalchreuter, 1984, 1987), and

may even bring significant commercial benefits. Recreational hunting is a multi-billion dollar industry in the US and in Europe (US Fish and Wildlife Service, 2002; Wiese, 1991). Statistics suggest that in Australia every third person goes fishing, and in the state of New South Wales 27 per cent of estuarine waters are now "free of commercial fishing" (Newsletter from the NSW Recreational Fishing Trusts, January, 2003).

At present around 6 million wild ungulates are harvested in the northern hemisphere every year, instigated by a complex framework of tradition, commerce, and social values (Bauer and Giles, 2002). In Germany, one of the most industrialised countries in the world, hunting remains an important land use and tradition. The result is a harvest of nearly 1.2 million ungulates, equalling approximately 50,000 tons of venison every year.

Fishing, more so than hunting, has been an important aspect of the lives of a large part of society. Its origins and pursuit have been much less questioned, and there has been generally little controversy surrounding its practice. Many people holiday on the coast, on islands, or by the riverside so that they can take their fishing rod, hand line, or crab basket. Whilst this may not be an independent industry, it is an essential part of holidaymaking. The emergence of a more specific and targeted fishing-tourism sector was probably connected to a rise in mobility, an increase in the number of recreational fishers, and the emergence of service providers (such as guides, boat owners, land owners, and resort owners) who could take advantage of the increase in fishers by offering special experiences, locations, and species, and constructing a price for it. We suspect this industry was a response to declining fish resources. The more expensive end of the market, big game fishing, which targets species such as sharks, marlin, and tuna, started as an elite industry in the US but has spread from there to many other countries.

Hunting and fishing are treated in this chapter as the harvesting of aquatic or terrestrial wild (i.e. not domesticated) animals. By combining hunting and fishing we also want to overcome the contrasts between the relative social indifference towards fishing, and the frequently negative public attitude towards hunting. Hunting and fishing both use wildlife, both can be humane and professional, or cruel and destructive, and both can only be justified, as Caughley and Sinclair (1994) express it, "…if they are sustainable…". By using a Triple Bottom Line concept (i.e. being socially, economically and environmentally accountable) hunting/fishing can contribute to a holistic and sustainable conservation approach, as recent examples such as CAMPFIRE demonstrate (Child, 1993).

From an ecological viewpoint, the sustainability of hunting and fishing relies on the principles of wildlife harvesting. Well-managed hunting can have a wide range of benefits for conservation (Bauer and Giles, 2002), which by its very nature is opposed to modern and intensive agriculture and forestry (Leopold, 1933). There is emerging support from those formerly subscribing to the protectionist-conservationist attitude, who now proclaim that rich trophy-hunting tourists might be the saviour of Africa's wildlife (eg. Roe et al., 2002; Baker, 1997a,b; Lewis and Alpert, 1997; Child, 1993; Meier, 1989). Hunting tourism seems to have become acceptable again, after many years of discredit by the conservation movement (of which many hunters consider themselves a professional part). For example countries such as Zambia, Tanzania, Zimbabwe, South Africa, and Namibia, which are safe-havens for Africa's magnificent wildlife, derive significant income from commercialised Safari hunting.

This tourism form has been instrumental in the development of highly successful community conservation models such as CAMPFIRE in Zimbabwe (Child, 1993). Recreational hunting and fishing, a vast industry in the “rich countries” (eg. Bauer and Giles, 2002), may provide increasingly important income to the poorer countries as consumptive wildlife tourism. This industry, however, still raises many questions for conservationists from western countries, while many non-western societies simply view it as an opportunity for income through consumptive wildlife use.

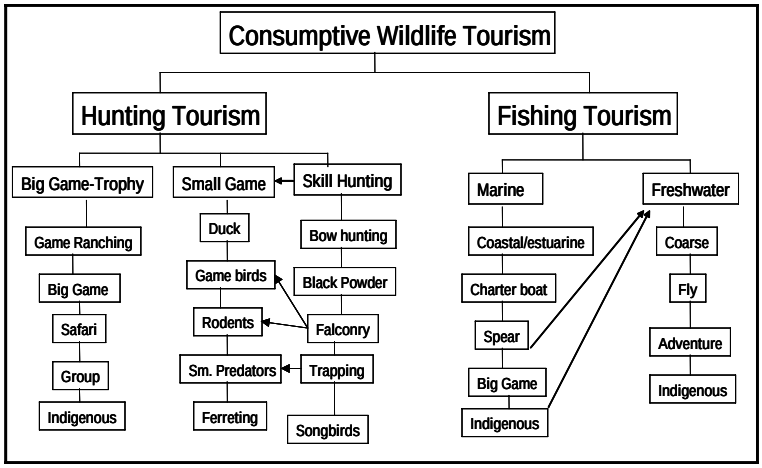
In this Chapter we mainly focus on the consumptive hunting and fishing aspects of the tourism industry, although the majority of the following is also applicable to the non-consumptive "catch and release" fishing. This review attempts to explain how this tourism industry works, estimates its volume and trends, identifies problems of sustainable hunting and fishing, and suggests improvements towards sustainability of the industry, including conservation and community development.

Classification of consumptive wildlife tourism

This review combines hunting with fishing tourism, and describes them as having distinct features, marketing, income, and biological characteristics (eg. Weaver and Oppermann, 2000). One feature of the tourism industry is the indistinct boundaries between its subcategories; many tourists like to mix hunting and fishing. In our attempt to classify the wide range of activities we separate hunting tourism into three different market segments (Figure 4.2): (1) the ‘big game’ hunters with their various subdivisions, all targeting the experience, adventure, potential danger, and acquisition of a trophy; (2) the ‘small game’ hunters, more interested in the hunting experience and skill displayed (two Olympic disciplines have emerged from this sport, trap and skeet shooting) and (3) skill hunting, which we classify separately by its highly specific use of certain hunting tools (eg. bow, muzzle-loader, and various traps).

The overlap between fishing categories is even more fluid, as freshwater fishing for example includes spear fishing, and charter-boat fishing may take place in marine or freshwater environments (Figure 4.2).

Figure 4.2: Consumptive wildlife tourism. Arrows indicate overlap in classification



Understanding recreational hunters' and fishers' motivations & perspectives

What types of people go hunting and fishing for recreation, and why do some spend significant funds on the activity? These questions do not have simple answers. Sociological research shows that people from all social strata, religions, and cultures, hunt and fish (McCorquodale, 1997; Davies, 1996; Schraml and Suda, 1995; Cartmill, 1993; Lee, 1987). Most of us have, at some stage of our lives, been holding a fishing rod or a simple hand line, dreaming of or even catching a fish. For many these early starts have grown into a life-long obsession, and in Australia a staggering 4.5 million people (24 per cent) claim to be recreational fishers. The situation is similar in Europe and North America, where individually, or in organised fishing clubs, people spend time and money to pursue the hobby, which has a number of specialised branches. Some of this fishing, the pursuit of the great, the magnificent, and the deadly, such as with the giant black marlin, tuna species, or the great white shark, has obtained the same status as safari big game hunting, and is actually called 'big game fishing'. Whilst the raw, and elemental nature of this fishing has been immortalized in Ernest Hemingway's "The Old Man and the Sea", it persisted mainly as the pursuit of the very rich. More recently it has gained popularity as society has generally become more affluent.

Most fishing and hunting, however, is less grand and is simply immersion in an elemental behaviour, ingrained in our genes through millions of years of evolution (see Buege, 1996; Johnson, 1981). From an evolutionary perspective it was essential for our primal nutritional needs, and it is always sure to give us a thrill, a moment of excitement, pride in our skill, and the feeling of achievement. Hunting is not significantly different from fishing, as many people perceive it to be. In fact much of it is a sort of terrestrial fishing, carried out with traps, nets, snares, and lines.

Most hunts and fishing tourism trips follow a certain pattern. The first step is to get your equipment together. The equipment needs care, replacement from time to time, and some follow the latest fashions and techno-innovations. For most, equipment has to be individual (hand-made is very important), age generally improves it and it becomes precious to us. The equipment might be a fishing rod, it might be a net, a trap, or it might be a bow or a spear, a boomerang or a firearm. While most of it is simply functional, much of it has acquired a status of its own, or is supposed to reflect the status of its owner.

In western society these tools of the trade are now a huge industry and market. In Australia, for example, most small towns in regional areas have a shop or a petrol station selling fishing rods, ammunition, rifles, rabbit traps, crayfish baskets, fishing line, or bait. The majority of business, for these stores, is from the tourists, who arrive from urban centres in search of the great outdoors, their dream of self-sufficiency (at least for a few days), their desire for adventure, for honing their childhood skills, or simply having a good time with their mates and their family. The ability to provide a meal from wildlife reflects on a person's status within a family, and having been the provider of meals from wildlife - we might assure the reader lacking this experience - that it feels good. Social aspects of hunting are, although poorly researched, of great importance (see Schraml and Suda, 1995).

Economics and markets

The number of hunters, in many parts of Europe, continued to increase during the seventies, but has remained stable or slightly declined from 1980 onwards (Bauer and Giles, 2002). This trend is reflected in the US where fishers and hunters combined declined by 2.2 million to 37.8 million from 1991 to 2001 (US Fish and Wildlife Service 2002). Interestingly, however, expenditure has increased significantly even though there is a smaller number of hunters and fishers. There has been a rather dramatic rise in outbound trophy hunting in North America, and a small rise in Europe (Fig. 4.3). Trophy hunting is a form of hunting tourism (and similar in fishing) that targets species depending on their size and body characteristics, such as antlers, tusks, or horns (see Bauer, 1993; Bauer and Giles, 2002). It features very prominently in connection with tourism from Canada, the US, and Australia, with Africa being an important supply country as the high exports of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) listed species indicate (Table 4.1).

Figure 4.3: Trophy imports of species listed in CITES (Hofer, 2002)

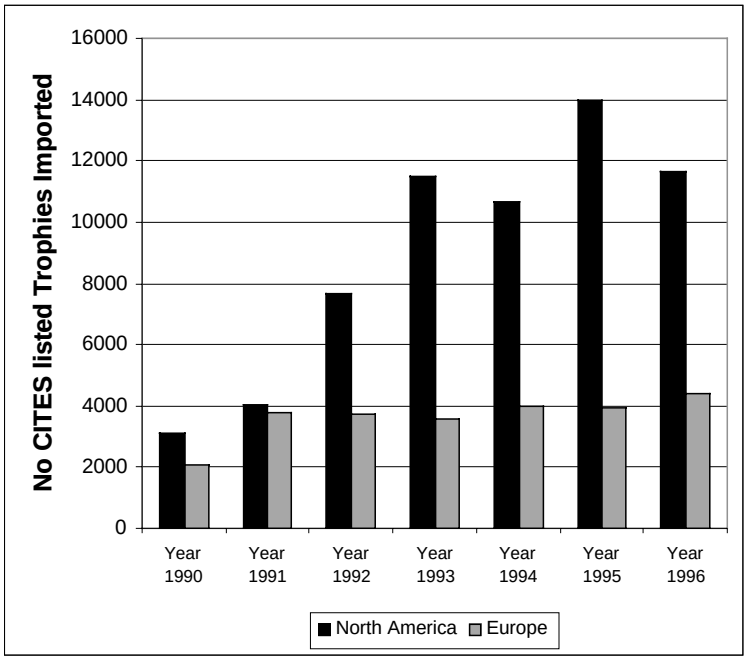


Table 4.1: Listing of major trophy and hunting species worldwide

Region	Species	Market Size
Europe and North Asia	Red Deer, Wolf, Brown Bear, Chamois, Argali, Ibex, Roe Deer, Blue Sheep, Himalayan Thar, Marco-Polo Sheep, Siberian Ibex, Serau,	A medium market with approx. 3200 CITES listed trophies imported to Europe and North America (1990-96)
Africa	Lion, Buffalo, Elephant Hippopotamus, Eland, Impala, Sita tunga, Waterbuck, Hyena, Crocodile	Very large and an important income for Zambia, Tanzania, Zimbabwe, Botswana, Namibia and South Africa with approximately 31000 CITES listed trophies introduced to North America and Europe (1990-1996)
North America	Moose, White-tailed Deer, Wapiti, Brown Bear, Black Bear, Puma	A very large market in particular in Canada. Dramatic increase in trophy trade from Canada to the US in particular Black Bear
South	Jaguar, Red Deer (i), Tapir	A relatively small market with only 880 CITES listed trophies

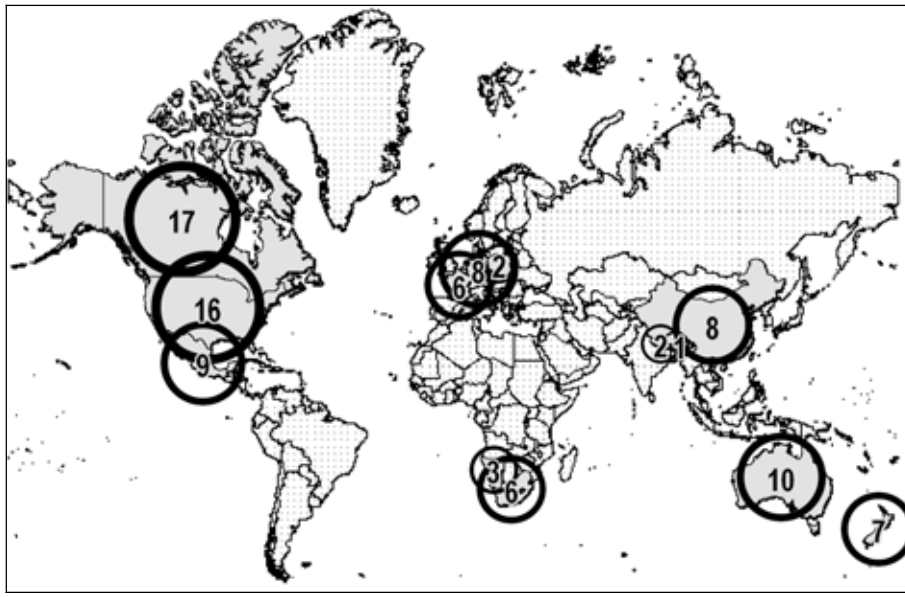
America		introduced to North America and Europe between 1990-1996
Oceania	Red Deer (i), Sambar Deer (i), Chamois (i), Himalayan Thar (i), Rusa Deer (i), Feral Pig (i), Red Fox (i) Banteng (i), Water Buffalo (i), Dromedary (i)	Overall a small market segment. On its own however a significant domestic industry in particular in New Zealand but also Australia

(i) – Introduced (Market size based on Hofer 2002, Bauer and Giles, 2002)

Demand and supply countries

In most western countries, with the exception of Canada, Australia, and New Zealand, the demand for hunting and fishing generally far outstrips the supply. In parts of Europe this trend has resulted in fishing clubs with virtually closed membership, and stringent criteria to join. In central, and increasingly parts of Eastern Europe with the Hunting District System (see later), many hunters without district access choose to go overseas. The importance of some regions, for hunting and fishing, stood out in the website analysis. Figure 4.4 presents a website analysis of the use of the word hunting for advertisements. North America is important in this industry as it serves supply and demand, while the circle size for Canada, Mexico, and South Africa, represents mostly supply countries. Despite its small size, New Zealand stands out for its relatively high representation due to a high number of introduced ungulates, which have become the basis of a very successful recreational and tourist hunting industry (eg. Davys et al., 1999). The absence of advertisements from former Russian countries reflects the lack of Internet use in advertising in these countries, not the absence of a market. Box 4.1 describes international hunting tourism from Europe, as an example.

Figure 4.4: Proportional representation of websites with the words tourism and hunting (countries in grey only). Numbers and diameter size reflect proportion of web sites



Box 4.1: International Hunting Tourism in Europe

Europe is the world's most diverse, and complex, legislative and regulatory hunting and fishing environment. It contains many traditional and indigenous elements, and has transformed them in a great diversity of customs and systems, which combine the old with the new, and the practical with the almost absurd. Nothing expresses this better than the situation of the songbirds in Europe, which are looked after with tender care and observed by millions of Northern Europeans, while in the southern regions an estimated 200 million songbirds are harvested as part of old and very dear traditions. In its entirety, Europe, with its 18 countries, constitutes the World's second largest hunting bloc (after the US) with almost 6.5 million active and registered hunters, or almost 2 per cent of its population (FACE, cited in DJV, 1999). During the past 20 years, however, many of the demands of these hunters were not being met within Europe, particularly in Germany and Austria with its district system there were thousands of hunters without access. These people then have to travel for the hunting experience, which might be cheaper, more diverse, and more exciting in exotic countries rather than in Germany itself. Pinet (1995) estimates that about 30 per cent of Europeans now travel abroad for hunting. German hunters preferred Eastern Europe, Italian hunters remained within Europe or chose South America and Cuba, Spanish hunters preferred North America, and Benelux hunters travelled to Africa. An increasing number of hunters seek the exceptional experience. This experience may include hunts for large game in remote and wild regions of the world. The extent of this industry is indicated by the frequency of species, destinations, and country characteristics in advertisements of hunting trips by the outfitter industry in Germany. Advertisements in Germany are representative of a powerful, highly organised, and economically viable group of hunters who make annual hunting trips, for which they pay up to 100,000 DM per year, to supplement their experiences within their domestic and highly-regulated hunting territories (Data from 1999). Advertisements in a German Hunting Journal "Die Pirsch" in 1999 offered 40 per cent of hunting trips to the former Eastern Bloc. Major destinations were Russia, Canada, Hungary, and Poland (Bauer and Giles, 2002). In Russia and Canada it is the attraction of large bears and Cervids, which gain the hunters' interest, whilst the remaining countries attract interest for a whole range of species. The experience of an exotic country is at least as important. It is notable that Australia occupies the last place of the 25 major destinations, although it offers a wide range of game species.

Not surprisingly, fishing tourism features even more prominently on the Internet than hunting. Figure 4.5 shows the number of websites that contain the words 'tourism' and 'fishing'. The frequencies express the importance of this industry for each country. The biggest demand and supply can be found in the largest consumer nation, the US. The large hits for Canada, Australia, and NZ, despite relatively low population numbers, suggests that these nations play a special role in offering fishing products, which are mostly charter-boat trips. This analysis included 14 advertisers with 1–2 different charter offers. Australian charters offer the highest number of species in the catch, Alaska the lowest. Coastal and marine fishing have the highest proportion of hits. Spear and charter-boat fishing are in much lower proportions (Figure 4.6), which may also reflect legal restrictions for spear fishing and the high capital costs for the charter-boat business.

Figure 4.5: Number of websites containing the words tourism in association with fishing for selected countries for 2003

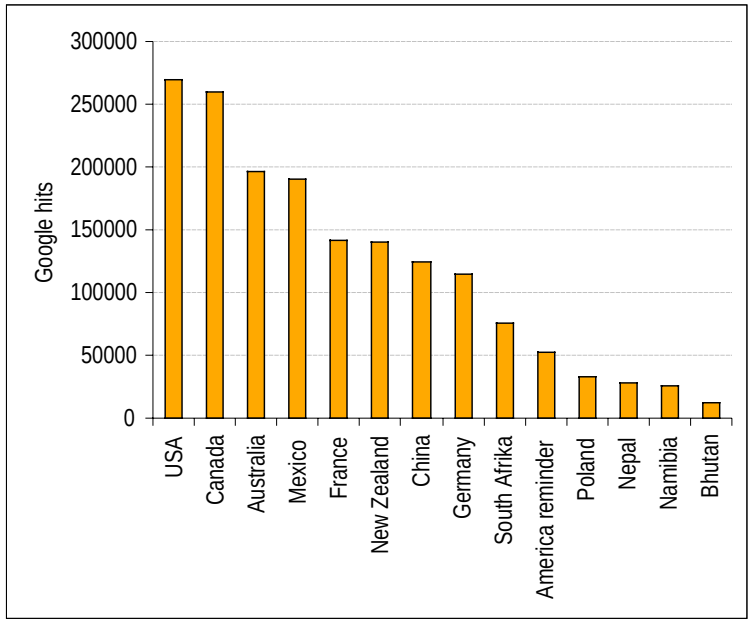
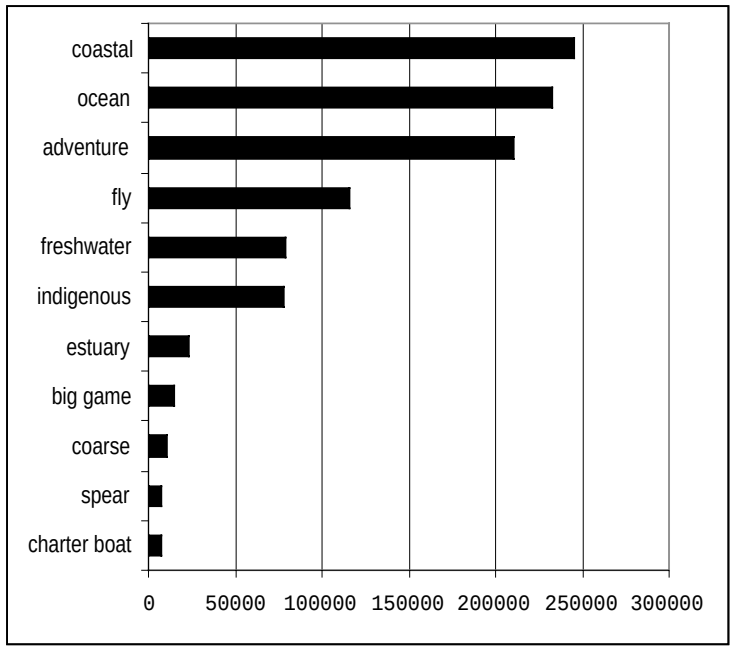


Figure 4.6: Google hits for a combination of fishing types, with search terms displayed



The hunting and fishing industry

The hunting and fishing industry constitutes a complex arrangement of stakeholders and auxiliary industries. It consists of a multitude of interactions, and an organised flow from client to organiser via the intermediary. Potential clients access their market through many journals, internet sites, fairs (eg. the International Hunting Exhibition), agencies, and by word of mouth. In the US, clients spent US$36 billion for fishing and US $21 billion for hunting (US Fish and Wildlife Service, 2002). The Intermediary (Hunting/Fishing Agencies) mediates transactions between the client and the organisers. According to Hofer (2002) about 100 such agencies advertise in the lucrative German market in Europe, and about 40 in Italy. As is the case for many tourism businesses (eg. Weaver and Oppermann, 2000), it is mainly the large companies that prevail, and, in hunting and fishing, firms such as Lechner dominate much of the market. Increasingly the consumer appears to feel safer using these providers (Hofer 2002). The organisers and operators, of hunting/fishing tourism experiences, are at the centre of the industry and in order to be competitive have to satisfy clients, comply with the demands of regulators, liaise with host communities, deal with advertising or tour agencies (or not if advertising directly), and ideally, for their own sustainability, be involved in the management of the target species and collaborate closely with indigenous communities who might traditionally own these.

Host community: Hunting and fishing is carried out mostly in either rural or natural areas. Many of these areas are inhabited by indigenous or traditional societies. For fishing which, contrary to hunting in some Australian states for example, is allowed in protected areas, the nation's wildlife services are the hosts. Ideally the communities hosting hunters and fishers should have a say in how the tourists are to conduct themselves, and derive profits from accommodation, guidance, and support services.

Auxiliary industry: As in any other tourism sector, transport, accommodation, food, equipment, and insurance providers dominate a large portion of the industry. Almost equally important is the manufacturing industry, which supplies the necessary hunting, fishing, and outdoor equipment. In the US an estimated US$14 billion were used on items for both fishing and hunting in 2001 (US Fish and Wildlife Service, 2002).

Design of hunting and fishing tourism products: Any tourism product is only successful if it manages to approximate, as close as possible, the aspirations, motivations, financial means, and preferences of its target groups (see also Weaver and Oppermann, 2000). In contrast to non-consumptive forms of wildlife tourism (Moscardo, 2003, this volume), hunting and fishing tourism businesses are generally financially profitable. Compared to other forms of tourism, hunters prefer fewer facilities and seek remoteness in pursuing their recreation (eg. Baker, 1997b). Clients are generally satisfied with their experience, which may incorporate special hardships, inconveniences, and even danger, as advertisements clearly demonstrate. It is not uncommon for agencies to reimburse for lack of success, but also to charge the trophy fee if the trophy from a lost animal is not recovered.

Impacts of hunting and fishing on wildlife and habitats

Hunting and fishing remove animals from populations. Ideally, both activities target sustainable yields (i.e. animals taken is equivalent to population surplus) or even maximum and optimum sustainable yields (see eg. Sparre and Venema 1998). This

target is, however, difficult to achieve, even in highly regulated hunting systems such as the ones in Germany, Austria, or Poland. Many commercial fishing fleets depend on sustainable harvesting models, however, recent collapses of entire fish stocks, despite being "managed" with sophisticated population models, tells us how elusive the achievement of this aim is (see also Caughley and Sinclair, 1994; Caughley, 1977). These activities, if undertaken in an unregulated environment and without regard to sustainable yields and behaviour, will destroy populations of animals; and have done so many times in the past (eg. decline of passenger pigeons at the turn of last century, or bush-meat trade, see for example: http://www.iucn.org/themes/ssc/news/bushmeat.html. The impact of hunting and fishing is a highly variable parameter, which is determined by factors such as:

- Type of hunting/fishing (chase, stalk, ambush, group, dog-aided);
- Species taken (low recruitment, high recruitment, alert, primitive);
- Intensity (occasional, regular, continuous);
- Season (rut, season of births);
- Time of day (resting periods, feeding periods);
- Tools (firearms, bow, trap, snare, line, net);
- Transport (on foot, horse, elephant, car, boat, helicopter).

In societies where hunting is well regulated, and important, such as Canada, the US, Russia, Germany, France, and the UK, a great body of research describes impacts and how to reduce these. For details see, for example, Olsen et al., (1996), Destefano et al., (1995), Madson and Fox (1995), Malan et al., (1994), and Bauer (1989). However, few studies on impacts have been carried out in tourism destinations in developing countries (eg. Caro et al., 1998).

Hunting impacts

Hunting can cause a wide range of impacts on target species, and these impacts (while disputed as to their extent) are reported widely in the literature on wildlife management (see also Green 2003, this volume). Examples include the impact of lead shot, frequently used in waterfowl hunting areas, impacts on non-target species, and impacts on habitats (e.g. Kalchreuter, 1984, 1987). There is a variety of hunting methods, such as snares and traps, generally associated with illegal activities that kill many non-target species. Hunting can cause different levels of disturbance, which impair the fitness of a population or have a level of perceived, or real, cruelty (Pacelle, 1999; Cartmill, 1993; King, 1991, Causey, 1989; Johnson, 1981).

Impacts on the long-term genetic fitness of a species may occur if, for example, trophy hunting is highly selective towards mature, large-sized, and often male, individuals. Theoretical papers claim negative consequences (Caro et al., 1998; Caro, 1994; Geist, 1988), and practical studies suggest impacts such as a change in sex ratio or in age distribution (Adamic 1997; Ginsberg and Milner-Gulland, 1994; Bauer, 1989; Bauer & Pflieger, 1989).

It is the worldwide experience that impacts of hunting can never be wholly eliminated, particularly in remote regions (often preferred by hunters), and countries that lack legislation or infrastructure to enforce regulations. Sophisticated game-management requires a consistent, long-term, objective research component, and the legislative and practical means for implementation through a responsible and well-trained group of hunters (eg. Bauer and Giles, 2002).

Impacts of recreational fishing

Impacts of recreational fishing tourism, on fish populations, are evident in freshwater habitats such as lakes, streams, rivers, and ponds. However, these impacts occur in the wider context of recreational fishing, so tourism aspects are not distinguishable. As the depletion of fish resources by recreational (including tourist) fishing is common (Regier et al., 1999), the restocking practices of dams, lakes, and rivers are widespread. This practice makes much freshwater fishing essentially "fish farming", an accepted practice, while its terrestrial equivalent, "game ranching" is highly controversial, in North America for example (Bunnell, 1993; Geist, 1988). Recent events, such as the impending closure of a significant part of the Great Barrier Reef, in Australia, to recreational fishing, hints towards the impact of fishing on marine stocks, which is exemplified by the higher fish numbers in protected areas compared to unprotected areas in the West Australian coral reef (Westera et al., 2003).

Management of hunting and fishing tourism

Management of hunting and fishing tourism relies on a wide range of activities including regulation, policy, and guidelines. The key elements, listed in Chapter 11, for framework development are also applicable here. Moreover, regulation has traditionally played an overriding part in the management of fishing and hunting, as this activity impacts on the natural resources of local communities and may involve potentially dangerous tools (eg. firearms, bows, spears). Consequently, this section concentrates on the legal dimensions of management. Frameworks, for tourist hunting and fishing, are generally defined by national or state hunting and fishing legislation, and by the respective economic authority, to realise commercial structures and practices within this system (Hofer, 2002). For the hunting and fishing tourists, adherence to these regulatory frameworks is a requirement, which if ignored may lead to their exclusion, individually or for all hunting and fishing tourists, or in extreme cases it may also result in prosecution, if laws are broken.

Hunting regulatory frameworks

The licence system (eg. Canada) is based on the right of any citizen to hunt in their country. The benefits from hunting may belong to the public, or to the state, and hunters who want to exercise that right must pay a fee (often per animal hunted) to a public office, or an appointed community, which has been endowed with that right by the state. The district system (eg. Germany) entails that hunting rights are tied to the land, and the benefits accruing from wildlife go to the landowner who might be a farmer, a community, a corporate body, or the state itself. The landowner, in order to exercise that right, must fulfil certain requirements (eg. have passed an elaborate hunting examination in central, northern, and eastern European countries, and possess a firearm licence). In some countries a Combined Licence and District System is in place (eg. Australia for kangaroo culls), which combines the two above systems, in that landowners must also obtain a licence. A Community-based System occurs in most parts of the world, where hunting is not regulated or enforced by authorities. Here local communities regulate resource exploration through, often intricate, social interactions and regulations to determine hunting rights/areas for community members. It is these members who will provide the hunting experience for the tourist.

Fishing regulatory frameworks

Contrary to hunting, fishing remains a commercial activity in industrialised countries, in both freshwater and marine environments. In many less developed regions it is virtually unregulated, in particular in places where (due to colonisation) community-based taboos and regulation were destroyed, and legislation, if existing, generally cannot be enforced. Most western countries, however, have adopted a district or licensing system, or a mix of these, in an attempt to make fishing more sustainable in an ecological sense. New South Wales (Australia) has only recently adopted a new approach to the management of its fishing, which resulted in the recovery of some fish stocks after only a few years (Box 4.2).

Box 4.2: Case study: The new fishing legislation of NSW-Australia

The Development of a National Fishing Policy in Australia was the start of a profound reform of fishing, both commercially and for recreation. The development of the policy coincided with a general recognition of declining fish stocks in marine areas, and declining native fish in freshwater systems of temperate Australia due to the degradation of freshwater environments (pollution, damming, erosion, land use, introduction of exotic fish species). It was also connected to the recognition of the importance of recreational fishing, when a national survey showed that five million Australians went fishing. This set actions in motion. From 23 March 2001, each individual who wished to fish, regardless of the location (marine fishing used to be free and unmonitored), was required to purchase a fishing licence. All licence fees were put into trusts to improve recreational fishing by:

- Buying out commercial fishing licences;
- Creating recreational fishing areas;
- Protecting and restoring fish habitat;
- Promoting responsible fishing;
- Stocking from fish hatcheries;
- Investing in more research.

There are now two recreational Fisheries Trusts - one for saltwater and one for freshwater - each is supervised by an angler committee. Persons also require licences for spear fishing. The money collected from licences is mostly spent on the implementation of active improvement programs. Commercial licences, to many estuarine areas depleted by commercial fishing, were bought out with fishermen being paid compensation. This resulted in the creation of "Fishing Havens", now covering 27 per cent of all NSW estuarine areas. The system is governed by Fishery Trusts, which support and finance a range of activities including catch monitoring, habitat improvements, native fish hatcheries, and fishing education.

International Treaties

National frameworks are complemented by international treaties, which clearly define and regulate trade in animal trophies (thereby influencing the demand for trophies itself). International treaties include the Ramsar Convention for the conservation of wetlands and waterbirds, and the development of the worlds protected area system. These directly, and indirectly, determine the accessibility of regions for hunting. International agreements, such as CITES, play an important role in the management of protected trophy species. The tourist market targets mostly non-CITES species (Hofer 2002), demonstrating how CITES effectively regulates the trophy hunting market, one

of its intended outcomes. Of the few CITES listed species offered for tourist hunting, most are bear, argali (wild sheep), elephant, and several species of wild cats such as lion and leopard. Over a time span of seven years hunters imported 88,013 CITES listed trophies (Hofer 2002), with the largest imports into North America (71 per cent).

Trade in CITES listed animals is only of a very small volume, and confiscations of trophies are uncommon (Hofer, 2002). Observations by Chestin (1998) suggest that regulations are powerful enough to lead to a complete breakdown of hunting tourism, as occurred in Russia when a protected species of wild sheep (Tien Shan Argali) had mistakenly been shot (mistaken for the, non listed, Marco Polo Sheep) (Hofer, 2002).

Hunting customs and local traditions

Hunting and fishing are not just subject to legal supervision. They are based, in many countries, on ancient codes of conduct and ethical constraints (McCorquodale, 1997), which in tribal societies can have "taboo" status. Not surprisingly, within functioning hunting and fishing communities these restraints are often more effective forms of regulation than legal enforcement. The community, in most cases, would more suitably punish an individual who violates these constraints, than any legal system. The development of this system is probably indistinguishable from the development of an individual ethical framework, which is also very strong.

The German hunting ethics *Jagdliches Brauchtum*, for example, uses the concept of *Waidgerechtigkeit*, which is a combination of tradition, rules, and guidelines aimed at protecting the game as a resource. It includes ancient rituals of worship and thanksgiving towards the game *Letzter Bissen*, but is also legally binding; adherence to this unwritten law is stipulated in the state hunting legislations. These local traditions and taboos are highly relevant to the hunting and fishing tourist, whose adherence to these will often result in acceptance into the community, beyond the tourist status. Disrespect of such customs, however, may result in the loss of access for the offending individual, or even for all hunting and fishing tourists.

On-ground regulatory strategies

The regulation of fishing and hunting (commercial and recreational) rests on a range of strategies, which generally complement each other. These strategies aim to protect populations (eg. limits and restrictions) and enforce humane hunting (eg. types of firearms and calibre sizes) and include:

- Establishment of fish/game reserve systems
- Open and closed seasons
- Establishment of bag limits
- Size restrictions
- Sex restrictions
- Type of bait
- Equipment
- Firearms and calibres that can be used (see Box 4.3).

Box 4.3: Prescription of specific weapons or calibres

In the case of firearm hunting, animal welfare is associated with humane, and efficient killing, to prevent suffering of the animal. Several states have legislation in place that prescribes specific weapons or calibres. In essence these prescriptions define a minimum energy that is to impact upon the game. For example, the German hunting law identifies that hunting of ungulates (largest species is the red deer, *Cervus elaphus*) employs a minimum calibre of 6.5mm, except for the smaller roe deer (*Capreolus capreolus*) where ≥ 1000 KJ muzzle energy is legal. The Australian state, Victoria prescribes a minimum calibre of 0.270 inches for the legal hunting of Sambar deer (*Cervus unicolor*), an introduced species.

Some key issues

Acclimatisation and stocking

Hunting and fishing tourism relies on a readily available game species. Many states, and also private land managers, increase the attractiveness of regions by increasing the numbers, and species, for fishing and hunting. This concept of restocking game and fish populations goes back many centuries, and has been considered in detail in Aldo Leopold's classic 'Game Management' (1933). It rests on the assumption that hunting or fishing is unsustainable or needs improvement, in some cases. One of the unfortunate side effects of this philosophy has been the introduction of hundreds of exotic species, into, for example, Australia, New Zealand, Papua New Guinea, New Caledonia, Argentina, and the US, notably by European settlers of either English or Scottish origin.

Illegal practices, hunting code violations and poaching

Illegal hunting and fishing, or poaching, has been, and continues to be, a widespread practice. It is even common in countries such as Germany, where hunters are subject to much public scrutiny, where the population density and road network is very high, where enforcement is very efficient and effective, and where conviction is certain and fines are high. In many parts of the world this framework simply does not exist, and hunting and fishing is only driven by one's need or ethical standpoint. There is a number of illegal activities, which may be associated with tourism including:

- Hunting and fishing without a hunting permit or a licence
- Hunting and fishing in areas that are not part of the hunting district
- Hunting and fishing in areas where the taking of game is prohibited
- Hunting and fishing using illegal methods
- Taking of protected species
- Non-quota or target animals being shot (age, sex)
- Exceeding quotas

There is little information on the extent of these illegal practices, however Hofer (2002), relating to unpublicised and confidential information, considers such practices "not to be occurring on a larger scale". Apart from national and legal violations there are (traditional) hunting and fishing codes, which generally alienate the perpetrator from the remaining hunting and fishing community.

Hunting and fishing and conservation

Hunting and fishing, in particular trophy, duck hunting, and to a lesser extent big game fishing, remain controversial issues (see Pacelle, 1999; Cartmill, 1993; Causey, 1989;

King, 1991; Johnson, 1981). During the past 20 years, hunters, in particular, have increasingly pointed to potential conservation benefits, while conservationists have been just as eager to point out deficiencies in this matter. No matter where one stands in this debate, the inclusion of tourist hunting, and trophy hunting, in species rehabilitation plans of world conservation bodies (eg. the Caprinae Action Plan published Shackleton, 1997) has become a common feature of conservation efforts in the developing world. There is also a range of conservation projects in place where trophy hunting is pursued as a conservation measure itself. Notably the WWF is actively involved in a safari hunting scheme for the Himalayan Ibex, as one component of a community-based wildlife conservation initiative in Pakistan, which involves wildlife utilisation (Palmer, 2002). The IUCN and the WWF identify fishing and hunting tourism as alternative resource uses that encourage conservation (Commission for Sustainable Development 1998).

During the past 15 years, a number of significant, some of them very recent, modifications in attitudes, new alliances, and legislative changes have emerged. In the early nineties, for example, the International Council for Game and Wildlife Conservation (CIC), a then 65-year-old international hunting organisation, became a member of the World Conservation Union (IUCN). A German State Hunting Organisation (LJV Baden-Württemberg) has also been accepted as a Conservation Organisation during this time. In 2003, New South Wales, Australia, became the first state to establish the NSW Game Council, which is charged with administering and promoting the rights and responsibilities of hunters. The majority of game-rich countries in Africa have re-developed systems of wildlife use, including safari hunting, which have changed community attitudes (from hostile to supportive of conservation), and provide much needed community income. Box 4.4 provides a case study of interactions between hunting and conservation.

Box 4.4: Safari hunting in Africa –conservation conundrum or the way ahead?

Whilst in the urban centres of Europe, North America, and Australia the debate on the acceptability of hunting as a conservation tool continues, an increasing number of African nations have introduced game-management systems within, and on, communal land. This, for the first time, has started to give hope for successful wildlife conservation (Baker, 1997a,b; Lewis and Alpert, 1997; Campbell et al., 1996; Chatwick, 1995; Child, 1993; Lewis, 1993; Lewis et al., 1990). Additionally an increasing number of farmers in Namibia, South Africa, and Zimbabwe have incorporated wildlife into their farm management, where they generally outperform cattle properties (Child, 1993; Meier, 1989). The majority of countries in Africa, which have incorporated hunting into their management strategies, make healthy profits. Still, problems remain, as benefits for rural communities are sometimes negligible (eg. in Tanzania and Zambia there is still a tendency for central control (Caro et al., 1998; Lewis and Alpert, 1997)), but such schemes have changed community attitudes from hatred of wildlife towards its potential as a major resource (eg. Child, 1993). In Zimbabwe, the National Parks department granted two districts authority over their wildlife, under the Communal Areas Management Program for Indigenous Resources (CAMPFIRE, Child 1993). In 1995, nearly half of Zimbabwe's 55 districts (most of which still contained good numbers of wildlife) had signed on to the program, 12 of which were earning US$1.5 million in trophy fees, and an additional US$97,732 from tourism, culling, and the removal of problem animals (Butler, 1995).

This situation has been replicated in Zambia, which in 1994 had 18 national parks and 34 Game Management Areas (GMA), mostly as buffer zones around parks. These GMAs cover more than 140000 km^2, almost twice as much as the National Parks, and over 20 per cent of the country. Total trophy hunting revenues collected, exceeded US$1.29 million in 1994, and have led to very significant shifts in community attitudes towards wildlife.

In Zimbabwe's 12 districts, the profits from wildlife use (including tourism hunting) contributed 15-20 per cent of the average household income, in 1993. The main significance of trophy hunting for these communities is that is provides a continual income, even during times of devastating drought (Butler, 1995). Similarly, wildlife utilisation (tourism, meat, trophies) is more profitable than cattle ranching for farmers owning large tracts of land. Although trophy hunting is by no means the solution to Africa's conservation problems, it contributes significantly and is presently the least problematic way for communities to utilise some their oldest, and culturally important, wildlife resources. This use resembles their pre-colonial way of life, while providing access to benefits not available from agriculture. In summary, hunting tourism provides

- Significant community income
- Disincentives for large cattle numbers
- Incentives for wildlife protection
- Incentives for responsible land use
- Alternatives to cattle in the Tsetse fly belt
- Improvement of attitudes to wildlife
- Increased income for government agencies involved in protection
- Incentives for farmers to restore wildlife (reintroductions)
- Opportunities for secondary industries (services sector)

Hunting and animal rights

In an analysis of the Australian tourism industry (Bauer and Giles, 2002), hunting was only reluctantly accepted as a type of tourism, in many ways reflecting attitudes towards hunting. The same did not apply for the fishing industry. However, hunting should be viewed in the same way as fishing, because both are consumptive and involve the taking the lives of animals, for what many people would term trivial entertainment and sport. This debate has been raging for many years (Cartmill, 1993), and a resolution is difficult as it deals with social and moral value systems (e.g. Vitali, 1990) outside of the scientific wildlife management debate (eg. also Caughley and Sinclair, 1994).

Commercialisation of wildlife management

The debate on the commercialisation of wildlife management - and hunting and fishing tourism is one aspect of it - is a very 'western phenomenon' that has been occurring in North America since the early seventies (eg. Hawley, 1993). Commercialisation involves the assignment of a monetary value to wildlife. There has been a growing trend to assign monetary values to the environment, and wildlife, and the 'relationships between ecological and economic systems' have become common research contents. Today, whether you like it or not, 'money is an integral part of wildlife management' (Hawley, 1993). Governments charge fees for licences, and society starts to identify the effects of revenues derived from wildlife related activities such as tourism. Conservation agencies collect large sums of money for habitat improvement, the establishment of wildlife reserves, and for the maintenance of wide global networks, offices, and jobs, to help conserve wildlife. Money is one of society's great inventions for furthering self-interest, and wildlife is just as susceptible to the forces of self-interest as any other resource (Hawley, 1993).

Hunting-tourism and indigenous communities

In the Yukon area of Canada, after successful land claims by indigenous people, only the outfitters with good indigenous relations managed to survive (Hoefs, 1999). In northern Australia, the biggest impediment in the development of the safari and fishing tourism industry have been unsatisfactory arrangements with often disgruntled communities, which see little return for what they feel are infringements on their own hunting rights (Palmer, 2002). The situation in southern and eastern Africa is similar (Baker, 1997a,b; Lewis *et al.*, 1990).

Significantly, in large parts of Australia, Canada, the US, and New Zealand, indigenous societies now have a greater say, and in fact, have recovered ownership of much of land they lost in the past, so they are now a significant stakeholder in the hunting and fishing tourism industry. In Africa, led by Tanzania, there is now an increasing number of very positive examples of host-community involvement in hunting, and its derived benefits (Baker, 1997 a,b; Lewis and Alpert, 1997; Baskin, 1994; Child, 1993).

The way forward

The diverse and vast tourism market that has developed around hunting and fishing justifies an investigation of their emergence as social phenomena. Issues include: hunting and fishing tourism volume globally, and for particular countries; and the challenges that certain features of hunting (consumptive use, trophy hunting) present to modern societies, the conservation movement, and its own regulation. Significantly, recreational fishing has started to replace commercial fishing activities in places such as Australia, indicating the importance that even industrialised society places on such activities. All these changes are paving the way for the development of a significant tourism industry, concerned with the consumptive use of wildlife. This is not only a challenge, but also an opportunity for the tourism industry to engage in the development of guidelines and to contribute to its own destiny through dialogue with regulators, stakeholders, and the local communities.

As a burgeoning industry, hunting and wildlife tourism has the opportunity to define its boundaries and future developments by reviewing, and if necessary expanding, existing guidelines and regulations of recreational hunting and fishing. This can form the blueprint for self-regulation, accreditation, and a suitable policy environment, for the hunting and fishing tourism industry. This regulation should incorporate an approach aimed at achieving the Triple Bottom Line outcome (i.e. being economically, environmentally and socially accountable). It could include, but is not limited to, the following:

- Establishing guidelines for ecological sustainability of the industry, including development of an accreditation system and identification of local community benefits
- Development and improvement of current destinations, through accreditation of operators and engaging in conservation initiatives aiming at sustainable wildlife use, habitat conservation, and community participation
- Engaging in R & D for wildlife management, and benefits from fishing/hunting tourism through coordination with hunting and fishing organisations and researchers

- Education and information of hunting and fishing tourists, stakeholders, and communities, regarding regulations, thus fostering dialogue with, and involvement of, all partners
- Developing new and potential destinations, with specific focus on habitat conservation, local community involvement, and sustainability
- Developing hunting and fishing as important elements of integrated natural-resource management, which links productivity with the environment and society

By including the Triple Bottom Line approach, hunting and fishing tourism can offer significant benefits for communities, particularly in developing nations, and so can positively contribute to conservation and holistic ecosystem management.

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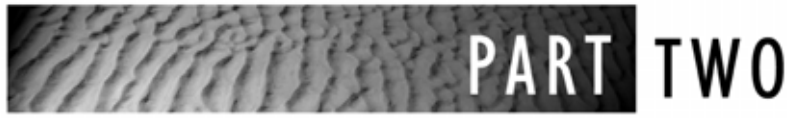

impacts of wildlife tourism

Chapter 5

Negative Effects of Wildlife Tourism on Wildlife

Ronda Green and Melissa Giese

Introduction

The title of this chapter does not imply an argument against wildlife tourism, which is often far more conducive to wildlife conservation than most alternative uses of the same land (see Chapter 6). However, as with most land uses, wildlife tourism must be managed if the activity is to be sustainable and is to have minimal impact on animals and their supporting ecosystems.

Tourism is increasingly being seen as a threat to wildlife and ecosystems (e.g. Croall 1995). Although it is often assumed that wildlife tourism is environmentally friendly because wildlife tourists tend to empathize with conservation and animal welfare issues, even conservationists and animal-lovers can cause unwitting damage. Moreover, whilst many wildlife tour operators are socially and environmentally responsible, this is not universal (Lubeck 1990).

Wildlife tourism operators need to ensure they do not damage the very wildlife populations their businesses depend on. It is also in their best interests to demonstrate to their industry that they are not diminishing resources used by other operators, and to prove to the accreditation bodies and concerned tourists that environmental impacts, including those on non-target wildlife, are minimized. Information on effects of wildlife tourism on wildlife is progressively accumulating, which means that management guidelines have to be dynamic and adaptive if best-practice management is to be maintained. Tour operators, planners and managers must keep themselves informed of actual and potential negative effects, in the same way that it is in the best interests of restaurant managers to keep themselves updated on possible causes of food poisoning.

Wildlife tourism can result in a range of negative effects. These vary from short-term changes in physiology or behaviour of individual animals through to long-term effects such as increased mortality or reduced breeding success of entire populations, and impacts at the ecosystem level, including effects on cryptic or less ‘exciting’ wildlife that are not the major focus of tourism. Short-term effects can cumulatively develop into long-term impacts and effects on individual animals can cumulatively affect populations and ecosystems.

The severity of negative effects of wildlife tourism on wildlife varies considerably with the animal itself, its species, age, sex, physical condition and stage of breeding, the kind of habitat it occupies, whether it is close to other animals, and previous encounters with wildlife tourism or other human activity (Swenson 1979, Cooke 1980, Poole 1981, Skagen et al. 1991, Holmes et al. 1993; Burger et al. 1995, Gabrielsen and Smith 1995, Knight and Cole 1995, Gill 2002). Severity will also vary with type, frequency and intensity of wildlife tourism, distance between a person (or vehicle) and the animal, and stimuli such as sound, light and sudden movements.

This chapter aims to identify the range of negative effects of wildlife tourism on wildlife and to identify the research needed to better understand the ways in which

wildlife tourism may impact on wildlife so that future management (see Chapter 11) can be better informed. We look briefly at some of the stimuli that can affect wildlife, then review some reported effects of wildlife tourism on wildlife. A more detailed review is presented in Green and Higginbottom (2001).

Kinds of stimuli that can affect wildlife

Wildlife tourism and associated developments (eco-lodges, roads etc) can expose animals to a range of stimuli, many of which will be novel to the wildlife. Characteristics of these stimuli will influence the responses of wildlife, and therefore the overall effects of wildlife tourism.

The very presence of humans is a stimulus that affects different animals in different ways. When an animal becomes aware of human presence, its response may range from avoidance (flee, hide or defend), through casual acceptance (which may be habituation – a learned response after frequent, non-threatening exposure), to attraction (often in expectation of food). Effects of human presence may be far from obvious. A study of nesting albatross showed no discernible impact from groups of tourists watching them, but longer-term data analysis revealed significant changes in the breeding colony (Higham 1998). Numbats (Daryl Moncrief, CALM, pers. comm.) may stop foraging and seek shelter at the approach of human footsteps, and eagles and divers have been seen to desert nests while walkers are still distant and probably unaware of the birds' presence (Huxley 1994).

Numerous studies have demonstrated a direct relationship between the distances to which animals are approached during wildlife tours and the responses elicited by them (Green and Higginbottom 2001, Ikuta and Blunstein 2003). The way people or vehicles approach wildlife also influences the response (see Box 5.1). Some species respond differently depending on the animal's stage of breeding. Golden plovers, for example, tolerate approaches to within 10 m while incubating, but do not generally permit approaches closer than 200 m after eggs have hatched (Yalden and Yalden 1990). Habitat features can also affect response. For instance, the flight distances of waterbirds in Southern Thailand are generally greater in open water than in reed beds or amongst other vegetation (Pierce et al. 1993).

Box 5.1: Research on the effects of visitors on breeding Adélie penguins

What was done?

Research was conducted on the effects of pedestrian approaches on Adélie penguins during their breeding season in Antarctica. Two main questions were addressed: (a) What is the minimum safe distance people can approach breeding Adélie penguins before the behaviour and physiology of the birds are affected? and (b) How is Adélie penguin breeding success affected by recreational visits?

Experiments were employed to quantify the responses of penguins when approached by a single person to 5 m, as this was the approach distance being recommended by many tour operators and Government expeditions as appropriate (Naveen et al. 1989). The effects of 15 and 30 m approaches were also examined to determine whether greater set back distances were justified. The responses of penguins were quantified from their behaviour (captured on video), and their heart rates (measured using electrocardiogram units and artificial eggs, (see Giese et al. 1999). The responses of penguins in the absence of human activity, when approached by other penguins and by predatory skuas, were compared with responses to human approach.

Key findings:

Approaches by a single human to 5 m interrupted the incubation activity of penguins, with birds standing off their eggs when approached. This could potentially cause egg cooling and reduced hatching success. Incubating penguins also became more aggressive and vigilant when approached to 5 m, and their heart rates were significantly higher than when birds were undisturbed or exposed to natural disturbances (i.e. interactions with other penguins or skuas). (Giese 1998). Heart rate results indicated that the energy expended by incubating penguins when approached closely by a human could be over twice that of penguins when undisturbed.

Approaching incubating penguins to 15 m had no measurable effect on their behaviour, but did elevate heart rates significantly above resting, undisturbed rates. Approaches to 30 m had no measurable effect on either the behaviour or heart rates of the birds. The responses elicited by the penguins were frequently reduced if the approaching person knelt at the minimum distance. Generally, penguins responded more strongly to approaches during the incubation phase than while guarding chicks.

In this study, regular disturbance at small colonies reduced the overall breeding success of penguins, compared to that of birds in undisturbed colonies (Giese 1996). The mechanism behind this may be the responses of individual birds that were quantified during human approach experiments (e.g. interruption of incubation activity and increased energy expenditure).

Lessons from this study:

- Approach distance can significantly influence the response of wildlife, however, visitor behaviour will also be important (e.g. the response to people kneeling).
- Wildlife may respond differently according to the breeding phase during which visitation occurs.
- Even short-term, relatively minor changes in behaviour and physiology could have longer-term consequences (e.g. interruption of incubation leading to potential egg-cooling and subsequent drain on parent's energy budget).
- The absence of a measurable change in behaviour does not necessarily mean an animal is not responding (e.g. results from being approached to 15 m).
- Regular visits within a breeding season may, for certain species or breeding groups, exert a significant, negative effect on breeding success.

The mode by which tourists approach wildlife can also influence the responses of wildlife. Effects of boats, for example, vary both with type of boat (Owens 1977) and wildlife species (Watkins 1997). Aircraft can cause extreme responses in some species, including fleeing (Sindiyo and Pertet 1984) and dispersal of feeding groups (Côté 1996), and can result in injury (Bowles 1995, Côté 1996) or death (Rounsevell and Binns 1991; Cooper et al. 1994).

Various other factors can influence the type of response elicited including the colour of clothing worn by visitors (Gutzwiller and Marcum 1993), the time of day or local weather conditions, but research is very limited.

Physical contact or close interaction with wildlife is popular with many tourists. Hand-feeding is especially common in many areas, and is discussed in another section of this chapter. Petting or other handling of captive animals can cause stress (Van Tiggelen 1994), but need not do so if the activity is well managed and the appropriate animals chosen for the experience. This is generally a welfare issue but could be a

conservation issue if breeding individuals of rare or threatened species were involved. Free-ranging animals are usually able to avoid contact, although slower moving species may be readily caught and handled.

Wildlife tourism can expose animals to frequencies and intensities of sound not normally encountered in their natural environment. Even sounds that may go unnoticed by humans can have significant effects on wildlife (Bowles 1995), with effects varying greatly according to the environment and the species. Nocturnal mammals, for instance, are regarded as having the most sensitive hearing among terrestrial vertebrates (Bowles 1995). Low-frequency noise can induce vibrations within both the substrate and a snake's body, confusing the signals needed for prey detection. Sound attenuates differently under water than it does in air, often travelling greater distances. Literature addressing the effects of underwater sound on wildlife, in particular marine mammals (for example see Richardson et al. 1995) is quite extensive. Cetaceans may respond to boats and aircraft in several ways, including avoidance, unusual surfacing behaviour or altering their swim speeds and social behaviours (Richardson et al. 1995 and references therein). Noise can have quite unexpected effects. Spade-foot toads are induced to emerge from their burrows by the sound of all-terrain vehicles, probably because the vehicles sound like heavy rain. This exposes the toads unnecessarily to hot dry air and predators (Brattstrom and Bondello 1983). Captive animals cannot easily escape the sounds of traffic, other animals or loud voices, which could produce stresses difficult to ascertain or remedy.

Artificial light is often used for human comfort and safety around eco-lodges and other areas frequented by wildlife tourist. It is also used extensively in the form of spotlights and other hand-held or mounted light-sources to view nocturnal species. Research into effects is minimal for most species.

The frequency with which an animal experiences a particular stimulus will also influence its response, and therefore the impacts of particular human activities. If animals repeatedly encounter the same stimulus without experiencing harm, they may habituate or become desensitised to that stimulus, and their response will be reduced (e.g. see van Heezik and Seddon 1990).

Absence of stimuli brings its own problems in captive situations, where many animals appear to experience intense boredom or lose many aspects of natural behaviour. The former is a welfare problem and the latter a conservation problem if they or their progeny are to be released into the wild. Many responsible zoos now invest considerable effort into providing stimulating and 'natural' experiences for their charges (Hare et al 2003 and references therein).

The following sections characterise the types of impacts of wildlife tourism on wildlife. These are presented as impacts on the short-term physiology and behaviour of individual animals, impacts on key behaviours that may lead to reduced survivorship of adults or young, and impacts resulting in direct mortality or injury.

Impacts on the short-term physiology and behaviour of individual animals

Short-term impacts are defined here as those that are reflected in the immediate responses of animals. Studies of the short-term physiological and behavioural states of wildlife can provide some of the most robust scientific information regarding negative effects of wildlife tourism, offering valuable monitoring tools, with warnings of more substantial problems.

The responses of wildlife to external stimuli, such as approaches by tourists, are often first expressed in the physiological state of the animal. Even if a disturbed animal does not flee, or show other behavioural signs of disturbance, it may experience increased heart rate, body temperature or other endocrine responses to human presence (Ball and Amlaner 1980, Giese 1998). Elevated heart rate is regarded as indicating that an animal has perceived a threat associated with disturbance (Ball and Amlaner 1980), and in some species increases in heart rate are considered synonymous with a stress response (Culik et al. 1990, Kosiorek and van den Hoff 1994).

Relationships have been identified between prolonged stress responses and subsequent weight loss, reduced breeding success and increased vulnerability to disease (Siegel 1980). Direct relationships between elevated stress levels and reproductive effects have been made for sea lions (Harris and Leiper 1995), double-crested cormorants (Ellison and Cleary 1978), black skimmers (Safina and Burger 1983) and auklets (Piatt et al. 1990).

Short-term behavioural and physiological responses have been linked to increases in energy expenditure among wildlife exposed to human activity (e.g. Knight and Temple 1986a, 1986b, Gabrielsen and Smith 1995). For example, elevated heart rates in Adélie penguins approached by humans triggers increases in energy consumption and the number of prey items that must be consumed to replace spent energy (Culik 1994). For species such as these, that breed in extreme environments, energy budgets are precise and relatively finite, and absences from the colony to forage and replenish spent energy will almost certainly result in egg or chick predation.

Other short-term effects reported include disruption of social activities among Indo-Pacific humpback dolphins in Hong Kong (Leung and Leung 2003) and changes to fish behaviour (Scholik and Yan 2002), with unknown implications for interacting species.

Importance of short-term changes

Short-term effects are often temporary or transitory in nature, but not always inconsequential. If elicited frequently or repetitively, or during sensitive times of an animal's life cycle, they may lead to cumulative impacts of significance to breeding groups, entire species or the ecosystem. For rare or threatened species, even transitory and seemingly minor effects on individuals may be of conservation concern. Quantifying the short-term physiological and behavioural effects of wildlife tourism can be the most useful level at which to measure and manage negative effects, because it is possible to conduct manipulative experiments in which the disturbance stimuli are controlled, and the animal's responses are objectively quantified (for example see Box 5.1). This means we can determine precisely what kind of stimulus (e.g. visitor group size or approach distance) elicits a particular response. Rapid collection and analysis of data can often be achieved, which means guidelines can be developed and disseminated relatively quickly and this is particularly important where wildlife tourism is expanding or changing rapidly. Understanding the short-term responses of wildlife to wildlife-tourism can also reveal much about the mechanisms driving some longer-term effects.

Impacts on key behaviours

Key behaviours are defined here as those directly linked to survival or reproductive success. They include foraging activity, parental behaviours, such as incubating eggs or provisioning and defending offspring, and the movement or migratory patterns of wildlife. Effects described in this section do not cause immediate death of the target animal, but can do so indirectly (for instance interference with foraging activity may weaken animals, leaving them more susceptible to disease or predation). They may also cause death of the animal's offspring.

Interference with breeding

Disruption of parental behaviour in response to human visitation has been reported from a number of species. Numerous reports exist of parent birds abandoning nests in response to human visitation (Green and Higginbottom 2001). For example, osprey, bald eagles, golden eagles and divers are known to desert when approached by humans (Ames and Mersereau 1964, Fraser et al. 1985, Huxley 1994). Even temporary nest desertion can reduce hatching success, either through increased predation or effects such as egg chilling, which can delay or prevent hatching. Human presence may also interfere with the provisioning of offspring, or increase rates of offspring predation either by inadvertently advertising the locations of breeding sites or distracting adults from defending their young (Ellison and Cleary 1978, Anderson and Keith 1980).

Human visitation has been linked to a decline in reproductive success for various species of colonially-breeding marine birds, including penguins (Giese 1996), pelicans (Anderson and Keith 1980, Anderson 1988, Gutzwiller 1995), terns, and gulls (Burger 1981, Burger 1984) and for various waterbirds (Titus and van Druff 1981, Keller 1989, Datta and Pal 1993). Effects can often be magnified for colonially-breeding species as the responses of a few individuals can trigger a reaction that spreads across an entire colony, sometimes with catastrophic effect (e.g. see Bunnell et al. 1981). Campers at Yosemite National Park one year interfered with nesting behaviour by destroying 30% of the nests of Stellarís jay and 20% of American robin nests by removing branches for firewood and making room for tents (Garton et al. 1977).

Wildlife other than birds has received less attention in the literature. American alligators and Nile crocodiles often desert their eggs when tourist boats approach too closely, resulting in the loss of eggs to predators (Cott 1969, Deitz and Hines 1980). The presence and behaviour of tourists on the beach during the green turtle nesting season has caused disturbance of females coming ashore to breed (Jacobson and Figueroa-Lopez 1994). Tourist vehicles sometimes separate young deer and antelope from their mothers, which may increase juvenile mortality (Edington and Edington 1990). Kangaroos and wallabies under stress are known to eject young from the pouch and escape without them, sometimes failing to reunite (Stuart-Dick 1987), which would lead to death of young. Artificial light produces various effects on nesting marine turtles, including disorientation of females when coming ashore to breed, and disorientation of their offspring after hatching (QPWS 1996).

Interference with feeding

Wildlife tourism has been reported to interfere with the foraging behaviour of various species, including lions and cheetahs in Africa (Sindiyo and Pertet 1984, Roe et al.

1997) and bald eagles, ravens and woodpeckers in North America (Garton et al. 1977, Knight et al. 1991). The animals were either disturbed at key times during prey capture, or they avoided preferred foraging sites when tourists occupied these. The overall effect of this kind of disturbance is often a reduction in the quality or quantity of food consumed. When interruption of foraging behaviour coincides with periods of food shortage or high energy demand (such as breeding), there is potential for longer-term, negative effects on survival and reproduction. Wildlife tourism can also affect the behaviour of animals by influencing their patterns of movement or their occupation of territories, with implications for effective foraging. For example, wildlife of rainforest undergrowth may avoid people by becoming more arboreal, moving to other territories, or avoiding trails used by visitors (Griffiths and Van Shaik 1995). Spotlighting can cause delayed emergence time by nocturnal marsupials (Lindenmayer and Press 1989). Several species of possum have been found to behave more normally under low-intensity spotlights (Wilson 1999), but differently-coloured filters did not affect them; the latter may not be the case for all nocturnal creatures. Scrunching underfoot of gravel and twigs (perhaps similar to sounds heralding the approach of predators) disturbed the possums far more than passing cars or quiet adult voices. Reactions to spotlighting may limit an animal's time spent foraging. If tourist activities are frequent, such responses may transmute into long-term changes.

Supplementary feeding of wildlife

The predictability of viewing wildlife is important for non-consumptive wildlife tourism (Duffus and Dearden 1990), and the provision of food is one means of increasing the probability that animals will appear and behave as expected. Hand-feeding can also be very popular with tourists (e.g. see Moore et al. 1997), because it offers visitors an opportunity to interact closely with wild animals.

Artificially augmenting the food supply of wildlife can, however, be problematic. Provisioned foods may lack essential nutrients (Wilson 1994, MBMPA 1997, Gill 2002), although few, if any, studies have yet linked food provisioning with long-term health consequences for animals (Cannon 1984, Orams 2002). An abrupt termination of hand-feeding can disadvantage animals that have developed a dependency on being fed and have lost the ability to forage naturally, resulting in potential behavioural problems and under-nourishment. Hand-feeding can also encourage wildlife to spend more time around roads and campgrounds, increasing incidence of collision with vehicles (Crome and Moore 1990 , Skira and Smith 1991). Some animals become habituated and docile when fed frequently, but others become assertive and even dangerous (Sindiyo and Pertet 1984, Marshall 1988, Knight and Temple 1995, Orams 1995, Orams et al. 1996, Moore et al. 1997, Kofron 1999). Supplementary feeding, whether intentional or otherwise, may alter the behaviour of wildlife such that they are no longer perceived to behave as wild animals. Lions and hyenas have been known to converge on stationary tour buses in search of potential prey (Marshall 1988), and a wide range of wildlife, including vultures, hyenas, elephants, bears, raccoons and skunks, forage around garbage bins and refuse sites in search of human foods (Sindiyo and Pertet 1984, Gill 2002).

In wilderness and nature conservation areas food provisioning may jeopardize natural ecological processes, but in areas already highly-modified by humans the situation is often less clear. Information is lagging far behind opinion on this topic, but some of the major (largely untested) arguments are presented in Table 5.1.

Table 5.1: Common arguments for and against the intentional feeding of wildlife

Arguments against hand-feeding	Arguments for hand-feeding
Ecological arguments	**Ecological arguments**
• Population numbers may significantly decrease, through inadequate diet, dependence on a resource later removed, learning of inappropriate habits, or disease.	• Where native vegetation has been cleared or modified, provisioning of food may help animals through lean times, or help threatened populations to recover.
• Population numbers may significantly increase, causing stress by promoting aggression between individuals usually more widely-spaced.	• Provisioning in natural areas can lessen mortality (especially of threatened species) at critical times such as after drought or bushfires.
• Population numbers of other species may change in response to changes in numbers or behaviour of those being fed (through competition, predation, or habitat damage).	**Other arguments**
• Hand-feeding of hay, grains or fruits may result in exotic plants germinating and persisting in a natural area.	• Allowing hand-feeding teaches people positive attitudes towards wild creatures, increasing their support for conservation measures.
Other arguments	• Interpretation of some features of animals is facilitated when they are close.
• Habituated animals may become nuisances or dangerous, sometimes necessitating their removal.	• Some feel a deep need for contact with wild creatures.
• Allowing hand-feeding in one place may encourage the same in inappropriate places.	• Some feel that by feeding a wild animal they are repaying a debt for the destruction caused by their own species.
• Allowing hand-feeding teaches people to see animals as playthings, or expect them to 'perform' on demand for photos, rather than respecting them as wild creatures.	• Photographic opportunities can be enhanced.
• Hand-feeding results in wild animals becoming semi-tame, and no longer true representatives of wilderness.	• Some animals are otherwise too unpredictable to guarantee sightings to visitors with limited time.
• An almost sacred element of the world's 'wildness' is seen as being diminished by allowing human/animal interaction.	• Provisional feeding enhances awareness by people who would never make the effort to see animals in more natural settings.

Modified from Green and Higginbottom 2001

Habitat clearing and modification

Clearing and modification of habitat is included in this section because it frequently results in the reduction or disappearance of resources essential for key behaviours such as feeding, breeding and predator avoidance. Habitat clearance is perhaps the most serious conservation threat to the world's wildlife, and on most occasions has little, if anything, to do with wildlife tourism.

Habitat may be cleared or modified for wildlife tourism, through the construction of accommodation, camping grounds, roads, parking spaces or picnic areas. Removal of understorey shrubs or large trees with hollows destroys resources for many animals. Habitat fragmentation brings problems of edge effects (Green and Catterall 1998), reduces territories and home ranges, and may enhance access by feral animals, including competitors or predators of native wildlife. Some habitats may seem little used by wildlife but provide critical resources during lean periods such as drought or failure of a regular food source.

The use of off-road vehicles (extensively used for adventure tourism and also for wildlife and other nature-based tourism in some localities) has been linked with damage to vegetation and increased rates of soil erosion and compaction (Buchanan 1979, Sindiyo and Pertet 1984), with consequences for animals depending directly or indirectly on affected vegetation. The use of vehicles on beaches is believed to have changed the physical nature of the burrowing zone in some areas, resulting in mortality of crustacea utilising sandy beaches (Steiner and Leatherman 1981).

Importance of impacts on key activities

Animals must obviously eat to survive, and must eat and breed to reproduce. As a result, any negative impact on feeding and breeding has the potential for serious consequences for individual animals, breeding groups, local populations or, in some extreme cases, entire species. These types of impacts generally take longer to manifest and therefore measure than do the short-term behavioural and physiological responses.

Hand-feeding of wildlife is totally condemned by many conservationists, including some wildlife tourist operators. Others maintain that any negative impacts can be outweighed if the activity is adequately controlled (Gill 2002) because tourists will often leave with a heightened conservation ethic after experiencing a satisfying close encounter with wild animals. Hand-feeding in national parks and wilderness areas is difficult to justify on ecological grounds except in rare instances of severe stress (for instance after a devastating fire or prolonged drought, especially where endangered species are involved). However, there are many situations where the surrounding habitat is already far from natural and there are no apparent conservation problems involved in offering appropriate foods to some species. Managing such activity can be quite complex, and often requires a thorough understanding of the animal's ecology and natural behaviour, and careful monitoring. The depth of human feeling stimulated by contact with wild creatures and the degree to which such interaction can foster an interest in conservation remain subjects for future research.

Impacts involving direct killing or injuring of animals

Wildlife tourism can lead to increased death or injury of animals with varying effects on populations. Here we discuss both deliberate killing (hunting, fishing, souvenir collection, elimination of problem animals) and accidental events (vehicle collisions, spread of disease).

Hunting and fishing

Hunting and fishing are large-scale activities (see Chapter 4), and subjects of considerable emotive debate encompassing philosophical, animal welfare and conservation issues. Activities range from individual recreational pursuits through to organised commercial tours. Concerns relate to unsustainable rates of exploitation, effects on the sex structure or genetic diversity of populations, disturbance or mortality of non-target species, and animal suffering.

Uncontrolled hunting can cause population decline and local extinction of wildlife, especially for species inhabiting fragmented landscapes (e.g. Powell et al. 1996, Cullen et al 2000, Fischer and Linsenmair 2001, Jerozolimski and Peres 2003, Milner-Gulland and Bennett 2003). However, most of this literature relates to subsistence and illegal hunting rather than regulated recreational or tourism-related hunting (see Chapter 4 for further information on legal and illegal recreational hunting). Fishing is also known to have depleted some stocks of both target and non-target species (e.g. Regier et al 1999). Some evidence points to declines of inshore fish stocks in Australia as a result of both commercial and recreational fishing (McPhee and Hale 1995). Significant differences have been identified in populations of coral reef fishes in Western Australia between areas where recreational fishing is regulated and areas where it is not (Westera et al 2003). Generally, however, the effects of recreational fishing on wildlife populations are poorly understood (Smith and Pollard 1996), and other pressures such as habitat alteration (Maitland 1995, Duncan and Lockwood 2001) may be more important.

Hunting and fishing may influence wildlife populations in other ways. A bias in shooting (mostly trophy hunting) of male brown bears in Slovenia appears to have changed the population sex structure (Adamic 1997). Similar effects have been reported for grizzly bears, where it has been suggested that population declines and even localized extinction may occur as a result of hunting pressure (Wielgus et al

2001). Effects can be more serious during sensitive times such as breeding (eg Lent 1971, Mano 1995), however these indirect effects may often go unnoticed because they manifest at a location or time removed from the hunting activity.

Non-target wildlife, including threatened species, may be accidentally killed by hunting or fishing, even though efforts to educate people in how to identify key species have probably decreased the occurrence of this in Australia (Garnett and Crowley 2000), America (International Hunter Education Association 2004) and other regions. Secondary effects can also occur to non-target species, for example through poisoning from ingested lead shot (Mudge 1983, Mateo et al. 1999, 2001, Blus 1994). Effects on non-target species may also occur when the target species is an important predator, prey or competitor of other species.

Animal welfare issues in relation to hunting and fishing include both physical and psychological suffering that individual animals may experience when being pursued or killed, especially in the case of protracted deaths of injured animals that escape (RSPCA 2003). Prolonged starvation of offspring when parents are killed is also a concern. Concerns about pain and fear felt by fish on a hook have been dismissed by Rose (2002) on the basis that fish lack the cerebral cortical structures responsible for pain in humans. Sneddon (2003) challenges this view on the grounds that fish possess nociceptors, which are responsible for detection of noxious and damaging stimuli in other vertebrates, including humans, and that their response to apparently painful stimuli is diminished by analgesics. This argues at least for the quick humane killing of fish as soon as they are caught.

Although there is extensive literature on sustainable harvest of target animals (Chapter 4), there is probably much yet to learn about more subtle changes, effects on non-target species, and the extent to which codes of ethics are adhered to in various countries and by different kinds of recreational hunters.

Specimen collection

Some forms of wildlife tourism involve animal collection. Shell and coral collection are probably among the most widespread examples of this. In some areas, including the marine parks off the Kenyan coast and the Galapagos Islands, shell and coral collection is reported as having a significant impact on reef ecosystems (De Groot 1983, Sindiyo and Pertet 1984).

Similarly, the mass collection of butterflies for tourist souvenir jewellery can be extensive and in some cases is considered to be far more damaging to populations than is collection by researchers and amateur naturalists (New 1991). In Brazil, for example, over 50 million butterflies are killed for tourist souvenirs each year (Carvalho and Mielke 1971). The impact of collections on populations and species is generally not well understood, and as with hunting and fishing, many impacts may take some time to manifest, with secondary effects on ecosystems being perhaps the most difficult to detect.

Killing of animals for safety or comfort

Tourists or proprietors of tourism accommodation sometimes remove animals perceived to be dangerous. Even harmless species of spiders and snakes are deliberately removed or killed to avoid incidents with tourists (pers. comm. with anonymous Australian proprietors). Liddle (1997) identifies the deliberate killing of

snakes to be one of two major impacts of tourism on these animals (the other being road kill).

Concern for comfort of tourists often results in heavy insecticide usage and the draining of swampy land to reduce populations of mosquitoes and other 'nuisance' insects. Other invertebrates and the vertebrates that rely on them (or on the swampy habitats) are likely to be affected, but we are unaware of any research on this relevant to wildlife tourism.

Collisions with vehicles

Wildlife tourism has the potential to increase road kill of terrestrial species by (a) bringing more traffic into a wildlife-rich area; (b) habituating animals to traffic and parked cars and thus making them less wary; and (c) creating a positive attraction to vehicles because animals learn to associate them with food provision. One road kill can also lead to another as carnivorous species visit the road to feed on carrion.

An apparently stable population of rock wallabies in the Warrumbungle Ranges (Australia) was progressively eliminated after the construction of both an access road below a popular summit and a walking track to the summit's peak. The wallabies were frequently disturbed by the voices and footsteps of tourists walking the track, and were subsequently hit by cars on the access road while fleeing (Fox 1982). Another Australian study provided good evidence that a whole population of eastern quolls became extinct as a result of deaths associated with upgrading of a road at Cradle Mountain-Lake St Clair National Park (Jones 2000).

Boats are also capable of causing significant impacts on marine and aquatic fauna. Shackley (1992), for example, reports that the greatest threat to the survival of dwindling manatee populations of southern Florida USA, is water-based tourism (only a small proportion of which, if any, would be wildlife tourism). In 1989, the population experienced an estimated mortality of 10%, chiefly through collisions with boats.

Introduction of disease

Wildlife tourism can also increase wildlife mortality through the introduction and/or spread of exotic diseases. One of the most serious threats to the persistence of endangered populations of apes involved in wildlife tourism appears to be the threat of disease transmission from humans (Butynski and Kalina 1998, Ferber 2000). Disease transmission can also occur amongst captive animals, especially the primates, who are most prone to human diseases. Disease transmission by humans to dolphins, primates and other species has also been noted (Skira and Smith 1991, Land for Wildlife 1992, Orams 1995, 1996, Wilson 1994, Johnson 1995, Platt 1995, Ringwood and Wesley 1995, MBMPA 1997, Moore et al. 1997). A concern with respect to the rapid expansion of human activity into previously untouched areas such as Antarctica, is the possibility that exotic diseases and pathogens will be inadvertently introduced and spread.

Importance of impacts leading directly to death or injury

Wildlife tourism can be a direct cause of increased rates of mortality or serious injury of wildlife, but this must be viewed in the context of other kinds of tourism and land-use. When breeding animals are killed or maimed there may be consequences for offspring and dependent mates, and when particular age or sex classes of a species are

removed, there may be consequences for population structure. This may lead to impacts on population numbers and, especially where keystone species are involved, whole ecosystems. However, detailed research in this regard is lacking for most species and communities. Although consumptive wildlife tourism is most often targeted for concern, seemingly harmless activities such as the construction of a new road and walking track, or the buying of souvenir shells and butterflies may sometimes have more serious consequences for biodiversity.

Conclusions

The seriousness of the effect of any tourism activity on wildlife can clearly vary from mild discomfort or inconvenience to local or even global extinction of a species, or disruption of communities and ecosystems, and it is not always easy to determine where a particular effect is likely to lie along this spectrum. Effects can be immediate and obvious, such as cranes flying into powerlines to escape human presence (Anderson 1995), gulls eating pelican eggs after nest desertion, or antelope being shot. Equally, they can be so subtle as to avoid notice even though such effects have the potential to lead to serious outcomes. Even relatively minor stresses, if experienced often enough, or experienced at key times of an animal's life cycle, may cause needless distress and influence the survival and reproduction of individual animals, with potential implications for breeding groups and populations. Such population effects are of particular importance where threatened species are involved, and even stress to individual animals can be of conservation concern in areas holding the last populations of endangered species.

There is ample information on some impacts of wildlife tourism on wildlife. Studies of the reactions of seabirds and waterbirds to various kinds of disturbance are relatively well documented and many provide guidelines for best practice behaviour. We know many of the conditions that will prompt crocodilians, penguins, raptors and ground-nesting birds to expose or desert their eggs and young, and what some of the consequences may be. We know that pursuing large predators for photographs can interrupt their own pursuit of prey, and we know that artificially augmenting food availability can render wildlife dependent on such food sources, with the result that some species become aggressive while others will expand their populations at the expense of others. We also know that seemingly insignificant and transitory changes can lead to larger ones, and that uncontrolled human-wildlife interactions have the potential for serious conservation effects when vulnerable species or ecosystems are involved. The evidence available to date allows us to identify key factors of wildlife that may influence their response, and therefore the impacts of wildlife tourism. These include the species, and the age, sex and breeding status of individual animals.

However, there remain important information gaps. We do not fully understand the overall effects of hand-feeding in localities already modified by humans, or how to determine adequately the likely effects on the species being fed and other species sharing the habitat, the consequences being likely to vary enormously with the situation. Nor do we understand all the impacts associated with consumptive wildlife tourism. More studies are also needed on the effect of spotlighting techniques for nocturnal animals, especially where flying or gliding animals are regularly viewed. Additional information is also required on critical periods for wildlife during which susceptibility to disturbance is greatest, and effects of wildlife tourism on non-target species is poorly understood. Another concern is that very little is known about the

effects of wildlife tourism on shy, cryptic species sharing the habitat with the more popular animals being sought by tourists. As with many of the questions requiring further investigation, the rarer and more secretive the species is, the more difficult studies will be.

In short, we know enough to advise that although wildlife tourism can confer many benefits to wildlife, activities should proceed with caution, to recognise some of the warning signs of trouble, and offer some general guidelines, even though further research is needed to refine these. In addition to formal studies by research ecologists, there is great value in the accumulation of accurate and relevant information gathered by those working in the tourism industry and conservation agencies, or by amateur naturalists. Careful monitoring of changes in wildlife behaviour, populations and habitat quality is essential for any quality wildlife tourism operation to continue without causing undue disturbance (as discussed in Chapter 11), and is also highly valuable as a research tool if results are shared.

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Chapter 6

Contributions of Wildlife Tourism to Conservation

Karen Higginbottom and Andrew Tribe

Introduction

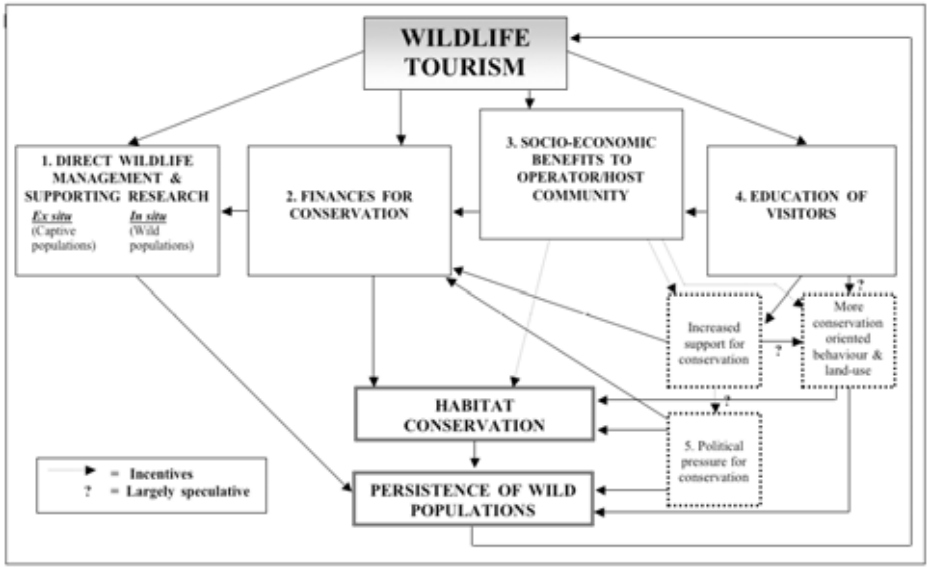
In wildlife tourism it is crucial not only to the conservation of the animals, but also to the sustainability of businesses concerned, that the net effects of tourism on wildlife are not negative (see Chapters 1 and 5). Further, there is increasing consensus among international tourism and conservation organisations, as well as national governments, that nature-based or wildlife tourism should go beyond minimising negative impacts on the environment, and contribute positively to conservation (e.g. WZO, 1993; Commonwealth Department of Tourism, 1994; WTO/WTTC/Earth Council, 1995; IUCN, 2003; see also Vaughan, 2000).

The net effects of wildlife tourism on wildlife are a result of the balance between any negative impacts of the tourism-related activities on the animals and any, generally indirect, positive contributions to their conservation. While the potential negative effects have been researched in some detail (see Chapter 5), there has been little attempt to systematically research and quantify these positive effects, and most of the available information is anecdotal.

The main ways in which wildlife tourism can (in theory) provide benefits to conservation are illustrated in Figure 6.1. It shows the links between key components of the system: wildlife, people and money. Most of these links apply potentially to all forms of wildlife tourism. Ultimately, conservation of wildlife involves what people do (or do not do), directly or indirectly, to wild animals or their habitats that increases the chances of long-term persistence of wild populations. The ways in which wildlife tourism is potentially associated with conservation benefits can be classified into one (or more) of a number of categories:

- Direct wildlife management, and supporting research – considered here to be deliberate manipulations of wild animals or their habitats to achieve conservation goals, by tourism operators or by their clients as part of tourism activities;
- Use of income derived from wildlife tourism to fund conservation initiatives. This income can be used to fund the operator's own wildlife management efforts, or can be donated to other organisations who carry out such initiatives;
- Provision of socio-economic incentives for conservation – operators engaging in wildlife tourism, or communities receiving economic or social benefits from wildlife tourism, have an incentive to act in a way that supports the conservation of the wildlife resource on which those benefits are based;
- Education of visitors such that they act to support or enhance conservation. This may be through enhanced political support or pressure for conservation by visitors, through influencing their behaviour towards wildlife, or through prompting them to make voluntary donations to conservation.

Figure 6.1: Potential positive consequences of wildlife tourism for conservation



Modified from Higginbottom, Tribe and Booth 2003. *Ex situ* direct wildlife management is principally confined to zoos, and the socio-economic incentive for habitat conservation is mainly restricted to wildlife watching and hunting.

This review focuses mainly on so-called 'non-consumptive' wildlife tourism (see Chapter 1), and distinguishes between the situation in zoos and in wildlife watching (viewing of animals in their natural habitats), while noting that these really represent a continuum in terms of degree of confinement (see Chapter 1). Most of the mechanisms described for wildlife watching are also applicable to hunting (and to some extent to fishing), and the main points relating to hunting are summarised in the concluding section of this chapter. A more detailed coverage of the conservation implications of hunting and fishing is found in Chapter 4. The zoos that are the focus of this chapter are the estimated 1200 establishments that are members of national or international zoo federations (IUDZG/CBSG (IUCN/SSC), 1993), of which there are currently 50 throughout the world (Olney & Fisken, 2003). We focus on these because they include all the major zoos around the world (in both less and more developed countries) and because membership of federated zoo organisations requires a commitment to work together towards joint conservation goals (see Chapter 3). Consequently, the most accurate and complete information and data about zoos comes from these 1200 'core' zoos.

Many authors have claimed that wildlife watching, like nature-based tourism in general, can be good for conservation (e.g. Roe et al., 1997; International Association of Fish and Wildlife Agencies, 2002; National Watchable Wildlife Program, 2001), especially because of associated economic incentives and education. Further, in policy statements and in popular terminology, wildlife watching is often seen as a form of 'ecotourism'. According to some definitions of this term, this necessarily means that the tourism is associated with conservation-related education and other localised conservation benefits (Weaver, 2001). Promotion of the concept of ecotourism by governments and industry associations in more developed countries like Australia and the USA has helped provide impetus to a number of initiatives aiming (in part) to

enhance the conservation benefits of wildlife watching, discussed later in this chapter and also in Chapter 13.

In this chapter we briefly review what is known of the nature, magnitude and effectiveness of each of the various types of contributions for zoos and wildlife watching, pointing out gaps in existing knowledge. We then use this information to draw general conclusions about the scope and magnitude of contributions to conservation by non-consumptive wildlife tourism; compare the situation between captive and non-captive forms, as well as more briefly with hunting tourism; and propose key directions to enhance contributions of wildlife tourism to conservation.

While our scope is international, the review is more immediately applicable to the more developed countries. The present chapter draws heavily on a report by Higginbottom et al., (2001), which provides further details on some of the issues covered in this paper that relate to wildlife watching.

Direct wildlife management and supporting research

Zoos

The involvement of zoos in conservation is chiefly *ex situ* (outside the natural habitat), involving genetic management and captive breeding. However recently some zoos have also become involved with *in situ* (inside the natural habitat) conservation initiatives.

Genetic management and captive breeding (ex situ)

Probably the principal contribution of most zoos to conservation is through effective genetic management of their animals. This occurs via cooperative species-management programs in which the genetic diversity, population size and origin of the founders are all accounted for. This genetic management is facilitated regionally through the zoo federations, and globally through the International Species Inventory System (ISIS), with the aim of having self-sustaining captive collections as 'insurance' for wild populations. ISIS data indicates that 92% of zoo mammals and 71% of birds are now captive-bred. Effective genetic management is vital not only for the continued maintenance of populations in captivity, but also for the role of zoos in supporting *in situ* conservation. It greatly enhances the probability of success when an *ex situ* population is used to re-establish or reinforce wild populations that will be exposed to natural selection at some stage in the future (Mitchell, 1991; Mallinson, 1995).

Zoos have also become involved in captive breeding for reintroduction, a process which when done effectively can play an important role in the conservation of endangered species (Rahbek, 1993; Wilson & Stanley Price, 1994) (e.g. Box 6.1). One country where zoos are heavily involved in this practice is Australia. Australian zoos participate in at least 35 recovery programs, which include 16 mammals, 10 birds, 6 reptiles and 2 amphibians (de Koff, 1998; see also Craig et al., 1999).

Box 6.1: The golden lion tamarin conservation program

With sound genetic and demographic management of golden lion tamarins across 100 cooperating zoos, the captive population of approximately 70 individuals in 1972 increased to over 500 animals in the 1980s, allowing surplus captive bred stock to be made available for reintroduction to Brazil (Kleinman et al., 1986). The project was coordinated by the National Zoo, Washington DC (Kleinman et al., 1991). In the first ten years of the program, the size of the known wild population increased by 20%; with about 17% of the tamarins being reintroduced captive-borns and their descendants (Beck et al., 1994).

However, in spite of some success stories, the role of zoos in captive breeding is probably of only limited value in conserving wildlife (Hancocks, 1992; Dixon and Travers 1994), in the light of two major constraints. The first is that there is limited space available for captive breeding, or devoted to holding threatened species (Seal 1991, Bartos and Kelly 1998, Conway 1999a). The second constraint is the high cost of producing captive-bred animals in zoos. For instance in Australia it has been estimated to cost on average A$6,546 for each native animal produced for reintroduction (Perth Zoo, 2000). Similarly, Alibhai and Jewell (1994) estimate that it costs more than 16 times as much to maintain a black rhinoceros in captivity than to protect enough appropriate wild habitat to support it. Consequently, Dixon and Travers (1994) and Hewitt (2001) argue that zoos are not the best places for conservation funds to be directed. It has further been argued that reintroduction of captive-bred wildlife requires greater monitoring and improvement if it is to have a significant conservation impact (Mallinson, 1995).

Given this situation it is perhaps not surprising that most animals for reintroduction do not come from zoos, but from other specialized facilities (Beck et al., 1994). More recently, there seems to be a trend to breed animals for reintroduction in their own country, although zoos in other parts of the world may have strong links with those *in situ* facilities (Stanley-Price and Sourae 2003).

In situ wildlife conservation

An increasing number of zoos now recognise the importance of promoting the interface between captive breeding and field conservation efforts in countries of origin (Durrell and Mallinson, 1998; Mallinson, 1998) (Box 6.2). For instance in 1992, less than 325 *in situ* conservation projects were being supported by American Zoological Association zoos, while by 1999 the number had increased to over 650 (Conway, 1999a). Similarly, federated zoos in the United Kingdom supported 177 *in situ* projects in 2000, an increase of 61% since 1995 (The Federation of Zoological Gardens of Great Britain and Ireland, 2001). If this trend continues, Conway (1999a) believes that zoos could become the primary non-government field conservation organisations. However, as Rabb (1999) records, few institutions are in a position to manage large natural areas by themselves, and the importance of involving local people and organisations in these field conservation projects is increasingly being recognised as a key factor in their long-term success (Mallinson, 2001).

Box 6.2: Examples of zoo organisations that make major contributions to *in situ* conservation

The **Wildlife Conservation Society**, from its headquarters at the Bronx Zoo/Wildlife Conservation Park oversees more than 300 field projects in 52 countries. This work includes evaluation of wild populations and habitats, endangered species rescue, captive breeding in the country of origin, and environmental education. They are directly involved in more than 115 parks and reserves protecting about 61 million hectares (Conway, 1999a; Orensteen and Johnson, 2001).

Jersey Zoo and its supporting charitable trust, Durrell Wildlife Conservation Trust (DWCT) was established in 1959 by Gerald Durrell 'to promote the conservation of wildlife' (Durrell and Mallinson, 1998). In pursuing this objective, the DWCT has moved beyond the Zoo's gates by setting up an endangered species breeding centre, promoting conservation principles among government bodies and local communities in many countries overseas (including South America, the Caribbean and Madagascar), recruiting conservation professionals from all over the world for training at the International Training Centre for the Breeding and Conservation of Endangered Species at Jersey Zoo, and the development of sister trusts in the USA and Canada (Mallinson & Hartley, 1997; Durrell & Mallinson, 1998). Its *in situ* projects include training local conservation personnel, supporting field research and local education projects, aiding the restoration of degraded habitats and land purchase, and actively participating in long-term reintroduction projects (Mallinson, 1991).

Research

The WZCS emphasises the research role of zoos, and the requirements for them to implement major and effective programs (IUDZG/CBSG (IUCN/SSC), 1993; Kelly, 1997). Today many zoos actively co-operate with research organisations, and by combining their resources, zoos and universities carry out research that individually they would be unable to do (Feistner and Price, 2000).

Zoo-based collaborative research is usually concerned *ex situ* with improving captive management through studies of nutrition, disease, reproduction and reproductive endocrinology, reintroduction biology, stress and behaviour (Mitchell, 1991).

Zoo research can also have a vital role in linking *in situ* and *ex situ* conservation activities. There is a flow of information from zoo researchers to field scientists that can assist in providing new insights into species biology and management, while reciprocally, data collected in the field can enhance efforts in captive breeding. Ryder and Feistner (1995) and Ryder (2003) have reviewed new research initiatives being undertaken by zoos and found that reproductive and genetic technologies have particular significance for conservation and management of threatened species. They conclude that this role needs to be expanded and developed as wildlife populations and biological diversity continues to decline, although Wildt (2003) also cautions zoos to ensure that their research is scientifically rigorous and not merely intended for short-term gain.

Wildlife watching

In contrast to zoos, direct wildlife management associated with wildlife watching is nearly always *in situ*, and generally covers a wider range of activities, such as reintroduction of animals, control of exotic predators, patrolling for poachers, tree planting and weed control (Box 6.3). Wildlife tourism operators involved in direct

wildlife management (or associated research) include government agencies, non-government, not-for-profit organisations (usually with conservation goals) and commercial tourism operators. In addition to deliberately undertaking activities that assist conservation, wildlife tour operators in some cases are thought to contribute indirectly by acting as deterrents to the disturbance or killing of wildlife by people, simply by being present in an area.

Box 6.3: Examples of wildlife-watching operators who participate in direct wildlife management for conservation

Earth Sanctuaries Ltd. is a publicly listed Australian company established with a conservation mission, but with the explicit intention of using tourism to help achieve this mission (Earth Sanctuaries, 2002). The company undertakes control and exclusion of feral predators, captive breeding of threatened species, combined with acquisition of animals from elsewhere, and reintroductions of these animals into a network of private reserves where they can be viewed by tourists. The company has successfully re-introduced 19 species of rare and threatened wildlife onto their land, including numbats, woylies, southern brown bandicoots, silver boodies (burrowing bettongs), greater stick-nest rats, mainland mala (rufous hare-wallaby), parma wallabies, bridled nailtailed wallabies and platypus (Earth Sanctuaries 2003). ESL has received major public and media attention for its conservation initiatives. While the company has recently sold some of its reserves, it continues to provide an important model and source of expertise for private landholders engaged in reintroduction.

Chaa Creek Ltd, Belize is a 135 ha private nature reserve and resort that operates as a commercial ecotourism venture. It has carried out reafforestation programs, takes part in local conservation programs for birds and howler monkeys, and has assisted in developing a butterfly-hatching project. It also participates heavily in local conservation-related education and employs 47 local Belize people and uses local products (Buckley, 2003).

Phillip Island Penguin Reserve (Australia), run by a government-appointed board, hosts one of Australia's most popular wildlife attractions, the daily 'Penguin Parade', involving close-up viewing of large numbers of penguins making their daily walk from the sea to their burrows. The Reserve's Committee of Management has collaborated with other researchers to oversee and help fund a large body of research and monitoring of the Little Penguin (Rowley, 1992; Phillip Island Nature Park Board of Management, 1998). This has included counting the numbers of breeding burrows and numbers of adult penguins at the daily 'Penguin Parade' over many years, following concern about population declines in the region. This research has demonstrated the likely role of predation of adults by foxes and dogs, destruction of habitat suitable for breeding burrows, and roadkill, which have since been targeted through management strategies near the tourist colony and elsewhere (Rowley, 1992; R. Leivers, General Manager, Phillip Island Nature Park, September 2001, pers. comm.). The studies indicate that the direct impacts of tourism have apparently been slight (Norman et al., 1992).

The Zaire Gorilla Conservation Project, in association with tourism activities, provided surveillance for a large area of a park inhabited by endangered mountain gorillas, with four of the largest families being monitored daily. This has been demonstrated to have helped reduce poaching of the gorillas (Aveling and Aveling, 1989; McNeilage, 1996).

In wildlife watching, in contrast to zoos, tourists as well as operators are sometimes involved in direct wildlife management or research. There seems to be a growing number of organisations, principally not-for-profit organisations, offering 'conservation holidays' (Box 6.4), and wildlife experiences are particularly popular (IRG, 1992; Preece and van Oosterzee, 1997; Ellis, 2003). Conservation organisations

are becoming progressively more involved in tourism, in recognition that this can provide a source of revenue as well as increase promotion of their goals.

Box 6.4: Examples of organisations specializing in working conservation holidays

Earthwatch Pty Ltd is the world's largest organisation that uses paying volunteers to assist with conservation-related research projects (IRG, 1992). It was founded in 1971 to preserve fragile lands, monitor change and conserve endangered species, and conducts scientific expeditions that draw about 3,500 participants a year (ibid). In the year 2000, about 4000 volunteers are expected to participate, each paying well over US $1000 (Earthwatch Institute, 2000). Out of over 100 projects offered across the globe in that year, about half were focused on wildlife. Typically participation in a single working holiday costs several thousand dollars. Marsupial Rescue is one such project in Western Australia that includes monitoring populations of endangered marsupials through activities such as trapping, spotlighting, radio tracking and maintaining predator-proof fences. In the rainforests of New South Wales, another wildlife project focuses on Australia's vanishing frogs and entails nightly frog and habitat surveys in the hope of finding clues to their worldwide decline (ibid).

Landscope Expeditions is a non-profit, self-supporting organisation established in 1992 by the Department of Conservation and Land Management (CALM) in Western Australia. It provides paying volunteers with the opportunity to work with scientists and experts in the field of conservation and land management. The expeditions are open to all members of the public with a reasonable fitness level and takes place in various, sometimes remote, locations across Western Australia. In 2001, there were seven expeditions advertised ranging from AUD$1795 to AUD$3795 per trip, offering a wide range of environmental activities including fauna surveys and feral animal control. The organisation aims to involve the community in conservation-related research and provide an opportunity for participants to gain knowledge of threatened species and environments. The research findings and outcomes obtained from these expeditions would not be possible if the volunteers did not pay for the expeditions (Kawalilak, 2001; K. Kenneally, pers. comm.).

As demonstrated by the examples in Box 6.3, direct wildlife management often requires channelling some of the revenue raised from tourism into these activities, and thus overlaps with the next category dealing with use of tourism income for conservation, though in some cases the main cost is staff time. In some cases the appeal of the tourism product to customers may be enhanced by the fact that the operator is actively involved in conservation and thus this also potentially becomes an economic incentive for involvement in conservation. There is often a strong overlap between these activities and the viability of the tourism enterprise (this applies to the example of Earth Sanctuaries Ltd given in Box 6.3 and is clearly the case for the examples in Box 6.4), so that this mechanism could alternatively be seen as falling under the category of providing an economic incentive for conservation. However, in many cases that incentive is incidental, since the organisation concerned was motivated to contribute to conservation primarily for reasons relating to personal philosophy.

Unfortunately there has been very little research to indicate the effectiveness of any of these initiatives in contributing to conservation (see e.g. Ellis, 2003). Whether a wildlife watching operation is actively involved in conservation appears to be usually dependent on the individual operator already having a philosophy or objectives that support conservation (Higginbottom et al., 2001), in contrast to the more institutionalised approach of the larger zoos.

Use of income derived from wildlife tourism to fund conservation initiatives

Zoos

Zoos invest considerable amounts of money in pursuit of their conservation objectives (Box 6.5). Unfortunately, in most cases it is not possible to calculate the amount spent specifically on conservation, because the costs involved are bound up with the normal running expenses of the zoo. This is particularly true for *ex situ* projects, where staff time, equipment and facilities may come out of routine operational budgets. In Australia, for instance, while the total income derived from the zoo industry was AUD$142 million in 1996-97 (ABS, 1998), it is not known how much was used to fund conservation initiatives.

Box 6.5: Financial contributions of zoos to conservation: examples of large contributions

UK federated zoos contributed approximately AUD$4.5 million to in situ conservation in 1995, and more than AUD$15 million in 2000. In addition, since 1996, specific campaigns to raise public donations for conservation projects have raised a further AUD$1 million (Federation of Zoological Gardens of Great Britain and Ireland, 2001).

Jersey Zoo and its associated DWCT had an *in situ* conservation budget for 2001 of approximately AUD$9 million (J. Mallinson, Director, Durrell Wildlife Conservation Trust, June 2001, pers. comm.). This covered their overseas projects, and International Training Program where indigenous people are trained in conservation techniques. It represented 23% of the gross income of the zoo and the Trust.

If zoos are to make a real contribution to biodiversity preservation, Kelly (1997) has suggested that they should commit a minimum of 10% of operating income to research and conservation activities. Some are already achieving this. Perth Zoo, for example, in their 1999/2000 annual report listed the total costs associated with producing seven threatened species for re-introduction programs as AUD$1,066,951. In the same year total revenue was AUD$5,909,138. Conservation expenditure thus represented 18% of their gross income.

However, most zoos have great difficulty finding additional resources to become involved in conservation programs, particularly given falling attendances and difficulty in maintaining commercial viability (Mitchell, 1994; Mallinson, 2001; see also Chapter 3). In a 1999 survey, Bettinger and Quinn (2000) found that while American Zoo Association zoos and aquaria had strengthened their support for conservation and research projects over the previous decade, on average facilities still spent only 0.1% of their operating budget in these areas. Their data included money spent on captive research, field conservation and staff. As Larcombe (1995) explains, zoos must balance between scarce exhibit display and husbandry resources and the competing demands of captive breeding of endangered species. He maintains that with greater involvement in *ex situ* and *in situ* conservation efforts, the costs of Melbourne Zoo's collection management plans doubled during the period from 1992 to 1995.

Donations seem to provide significant potential for raising additional revenue for conservation in zoos. Larger zoos now often include sponsorship of animals as a significant source of their revenue (although this is often essential for them to cover their operating costs). Several zoos in the United States have conservation contribution machines for visitors to donate cash towards the conservation of their chosen species.

Bronx Zoo provides an opportunity for visitors to donate part of their admission fees towards conservation projects linked with their Congo Basin exhibit (Conway, 1999b, Andersen, 2003). In fact Conway (1999b, 2003) has suggested that more could be done to channel revenue from zoo visitors into conservation, including a suggestion that visitors could pay a fee for viewing each endangered species, with the funds being used to support protection of their habitat.

However, such suggestions assume that zoo visitors are interested in wildlife conservation, and there has been little evidence that this is actually the case. There is a lack of knowledge about how zoo participation in conservation affects levels of visitation, and little information about the expectations, interest or satisfaction of visitors with the role of zoos in conservation (E. MacAllister, Director, Adelaide Zoo, October 2001, pers. comm.).

Wildlife watching

There is a range of government charges on commercial nature-based tourism operators and tourists. This revenue is intended to contribute to the costs of management associated with tourism activities (Box 6.6). Most of these fees relate to use of protected areas (where a large proportion of wildlife watching occurs). Less common is the practice of requiring permits (with associated fees) for tourism operators who offer close encounters with particular species of wildlife that are of conservation concern, even if outside protected areas. For instance in Western Australia, operators who provide encounters with whale sharks must pay for a special interaction license (D. Coughran, pers. comm. 2001).

Box 6.6: Types of government-administered user fees applied to wildlife tourism (from Higginbottom et al., 2001)

Charges relating to nature-based tourism that may include a wildlife component

1. Entrance fees to protected areas
2. Fees for use of services or facilities in protected areas
3. Visitor levies applying to protected areas
4. Licence fees for commercial tour operators in protected areas
5. Concession and lease fees for commercial operations within protected areas
6. Merchandising revenue and royalties associated with protected areas
7. Taxes

Charges specific to wildlife tourism

1. Licence fees for commercial operators who provide encounters with wildlife species of particular conservation concern (even outside protected areas)
2. Licence fees for exhibition of captive native wildlife
3. Licence fees for recreational-fishing operators, even outside protected areas
4. Licence fees for individuals who participate in recreational fishing or hunting
5. Admission/tour fees at government-owned wildlife tourism attractions; generally involving those in protected areas and certain captive wildlife attractions
6. Merchandising revenue and royalties associated with wildlife tourism attractions

However, revenues from parks around the world are generally not sufficient to offset fully their operating costs, let alone to provide net funding for conservation (Goodwin et al., 1998; Wilkie and Carpenter, 1999; Vaughan, 2000; Adams and Infield, 2002). There are a few notable exceptions. User fees at some parks or in some regions provide revenues that not only support their own operations but also provide funding for conservation measures (Lindberg et al., 1996; FPTF, 2000; IUCN, 2000; GBRMPA, 2001). Further, it has been argued that there are opportunities for

substantially increasing entrance fees to many protected areas worldwide (Giongo and Bosco-Nizaye *undated*).

Most of the cases reported in the literature where government charges relating to wildlife tourism have raised substantial funding for conservation involve large game hunting (see Chapter 4, Freese, 1998; Wilkie and Carpenter, 1999). One of the few published cases involving wildlife watching is tourism based on mountain gorillas in east Africa. Income from tourism has been used to help pay for habitat conservation and anti-poaching measures that have apparently been crucial to conservation of this endangered species (McNeilage, 1996; Butynski and Kalina, 1998). Even in this case, however, effective conservation has also required input from non-tourism related funding sources (Adams and Infield, 2002; Buckley 2003).

Some developed attractions based on wildlife watching provide significant revenue for conservation (Box 6.7). Many authors suggest that the revenue-generating potential of some nature-based tourism products (both private and public) is not being realised, particularly where the revenue is seen to contribute to conservation (Lindberg, 1991; Pearce, 1995; Laarman and Gregersen, 1996). It is important to caution, however, that such indications of willingness do not necessarily translate into action.

Box 6.7: Opportunities for increased revenue for conservation from wildlife tourism

McNeil River State Game Sanctuary in Alaska, USA, provides exceptional opportunities for close-up viewing of brown bears in the wild, and demand for the limited number of viewing permits exceeds supply. Visitors indicated that they would be willing to pay, on average, an additional US$200 per visit if the extra costs went to management of the Sanctuary (Clayton and Mendelsohn, 1993).

Marine Protected Areas in the Caribbean region are visited by an estimated 3.75 million divers annually. A survey indicated that divers would be willing to pay user fees to be allocated to reef conservation that would amount to an extra US$93 million in revenue (Green and Donnelly, 2003)

Mon Repos Conservation Park, Australia generates revenue from sea turtle-viewing tourism, much of which is channelled into sea turtle research, patrolling nesting beaches and predator control measures to protect the turtles (Tisdell and Wilson, 2002). On average, visitors surveyed after their experience indicated that they would have been willing to pay more than double the existing fee (Tisdell and Wilson, 2002), apparently with the knowledge that such revenue helps support turtle conservation.

Like zoos, some wildlife-watching enterprises donate at least some of their profits to conservation initiatives, or provide opportunities for their guests to make financial contributions to conservation through donations or sponsorships. For example, Munn (1992) reports that 30-50% of North American and European tourists who visited Manu Biosphere Reserve (Peru) made donations of US$50-$100 annually to a local conservation group (Munn, 1992) (see further examples in Lindberg, 1991; IRG, 1992; Higginbottom et al., 2001; Shackley, 2001; Buckley 2003). There seems to be scope for expanded use of visitor donations (Lindberg, 1991; IUCN, 2000; Higginbottom et al., 2001).

Although application of the 'user-pays' principle is becoming increasingly widespread (Goodwin et al., 1998; IUCN, 2000), there is a range of philosophical,

political and practical constraints on the use of this mechanism to fund conservation (Butynski and Kalina, 1998; Buckley, 2000a; IUCN, 2000; Lindberg, 2001). The tourism industry tends to be understandably resistant to government moves to increase charges that may reduce their profits or visitor demand (Vaughan 2000). Further, it has been argued that a focus on tourism as a source of revenue for conservation may detract from the potential to raise such funding by other, more effective, means (Isaacs, 2000) and that income from tourism is notoriously variable over time and thus not a secure basis for funding (Vaughan, 2000). In the face of numerous publications that talk optimistically of the potential to raise revenue for conservation through tourism, it is important to caution that this can only be one small part of the solution in most cases (Wilkie and Carpenter, 1999).

Provision of socio-economic incentives for conservation

Zoos

Contemporary zoos not only have a self-imposed commitment to conservation, but they are subject to a socio-political imperative to contribute to conservation, reinforced by zoo legislation. For instance, the Secretary of State's revised Standards of Modern Zoo Practice in the UK and the European Union's Zoos directive both state that in future zoos will have to satisfy conservation requirements to be re-licensed (Department of Environment, Transport and the Regions, 2000). Similar legislative requirements have been introduced in Australia (Department of Natural Resources and Environment, Victoria, 1998). These requirements reflect a view of society that keeping animals in captivity must be justified on conservation grounds (Conway, 1999b; Tribe, 2000).

In general, however, while zoos actively promote themselves as contributing to conservation, they seem less sure about the role of conservation in attracting customers. Indeed, there is little information about the expectation or satisfaction of visitors with the role of zoos in conservation (MacAllister, pers. comm. 2001, see also Chapter 3). In the absence of evidence, some zoos seem reluctant to fully embrace their conservation potential, apparently believing that money spent on conservation will not be compensated by increased visitor revenue (ibid, cf. Cherfas, 1984). In so doing, such zoos may in fact be missing out on important marketing and fund raising opportunities. Gipps (1993) suggests that the problem with zoo management is that it does not realise that 'conservation can sell tickets', and if zoos are to attract visitors and financial support, then they will have to work harder at promoting their conservation activities. For an industry committed to supporting wildlife conservation, it is clear that more information is needed about the role that conservation can play in supporting the industry.

Wildlife watching

Since, unlike zoos, wildlife watching is dependent directly on the existence of natural populations of wildlife, the ability to maintain this form of tourism can provide a vital incentive for operators and/or host communities who benefit from the tourism to conserve the wildlife and habitat on which it depends (cf Buckley, 2000b; van Oosterzee, 2000; Sekercioglu, 2002). This is often considered the major conservation benefit associated with nature-based tourism (e.g. Buckley, 2003). This point is linked to a major debate on the commercial use of wildlife and privatisation of wildlife resources that has been an important topic in wildlife management circles in recent

decades (see Hawley, 1993; Freese, 1998; Chapter 4 this volume). The idea is that by attributing a financial value to wildlife, people who benefit financially will be motivated to conserve the wildlife. A further benefit as perceived by governments is that it can alleviate pressure on the public purse for conservation funds. While a commercial orientation towards wildlife to aid conservation is generally accepted as appropriate in less-developed countries, its application in more-developed countries remains controversial, although it has received increased acceptance in recent years.

One consequence of this shift in conservation philosophy is promotion, support for, and growth of development of wildlife tourism on privately or communally-owned land. Kenya is typical of many less-developed countries, especially in southern and eastern Africa, in adopting a policy direction designed to ensure that the benefits of wildlife to landowners create incentives to invest in wildlife conservation, and that landowners work in partnership with (rather than in opposition to) the government wildlife agency in this regard (Milner-Gulland and Mace, 1998). In the United States and elsewhere in the more-developed world, governments are also increasingly looking at ways that landowners can benefit financially from conserving natural habitats and wildlife (Freese, 1998; Duda et al., 1998; Benson 2001). As financial benefits from hunting tend to be greater than those associated with wildlife watching (Freese, 1998), much of the focus of such initiatives has been on hunting (see Chapter 4, Freese, 1998).

There are several published examples of wildlife tourism creating an economic incentive for conservation of private lands or acquisition of additional lands to be managed for wildlife (see also Higginbottom et al., 2001). The Conservation Corporation Africa, a private wildlife tourism company, reportedly 'represented the biggest private investment in conservation in southern Africa' by 1993 through its purchase and management of land for this purpose (Roe et al., 1997, p. 30). In a survey of 27 private game-reserve managers in South Africa, 48% said that if [wildlife] tourism had not been a commercial option, they would have continued to farm cattle (which is generally considered to be a less sustainable land-use in such areas) (James and Goodman, 2000). Across South Africa more generally, successful reintroduction programs on hundreds of private game-reserves and small state reserves are reported to have been motivated largely by the economic incentive provided by wildlife tourism, especially wildlife watching (S. Pimm, Professor, University of Tennessee, July 2001, pers. comm.). These and other examples demonstrate recovery of fauna populations in private game-reserves used for wildlife watching (e.g. Morgan, 2001), although the economic incentive associated with hunting tourism appears to be even stronger in most cases (e.g. Decker et al., 2001). Generally it seems that landowners in such situations also have an altruistic desire to support conservation; nevertheless tourism provides them with the financial opportunity to act on this interest.

Introduction of wildlife tourism may also provide an economic incentive leading to conservation-oriented changes in wildlife management practices by local people. This is likely to be of most conservation significance in cases where the wildlife is hunted or taken for live trade for subsistence or commercial purposes. The mountain gorilla is a classic case of a highly endangered species, threatened by poaching, for which it is widely thought that the introduction of tourism has allowed continued survival, largely because of a socio-economic incentive (McNeilage, 1996; Vieta, 1999; but see Adams and Infield, 2002). A similar argument may apply in more developed countries, where

it is most likely to apply to species normally considered to be pests, particularly to agriculture (e.g. Brooke, 1996).

Several international examples (mostly from less-developed countries) illustrate links between implementation of wildlife tourism and increased support for wildlife conservation from local communities, who benefit through income and/or employment (e.g. Box 6.8). These include political support for a ban on hunting (Parsler, 1997) and apparent increased support for the protection of wildlife (Groom et al., 1991; Shackley, 1995; Gillingham and Lee, 1999; Higginbottom et al., 2001). Despite numerous anecdotes, evidence for changes in local attitudes as a result of nature-based tourism is mostly of poor quality (see Higginbottom et al., 2001 for more details). Some reports of a shift from negative to positive attitudes to protected areas in less developed countries because of benefits from wildlife tourism may have been overstated (e.g. Adams and Infield, 2002).

Box 6.8: The Great Texas Coastal Birding Trail (GTCBT): using wildlife tourism to increase public support for conservation

The GTCBT has been developed to provide a high-quality birding experience, in order to attract much-needed income to depressed Texas coastal communities and to raise local perception of the value of birds and their habitats. Texas has more species of birds (over 600) than any other US state, and most of these species reside or migrate along the coast. Driven principally by the Texas Parks and Wildlife Department and a private consultant (Fermata Inc), it has involved a partnership between government agencies, private landholders, conservation groups, businesses and communities, and has used funding primarily from a federal government grant. About 300 suitable birding sites were selected, for which local sponsors and/or partners would provide maintenance and management, and then organized into a cohesive Trail linked to the coastal highway system. Maps and signage were produced, and enhancements were funded at selected sites, such as landscaping, observation platforms and boardwalks. The development of the trail received substantial publicity in the mass media, progressively increasing interest from local communities in having their sites included. According to Fermata Inc, the Trail has been an 'unmitigated success', exceeding the expectations of most participants in terms of visitor demand and interest from local communities and the media. They claim that Texas is now recognised as a premier destination for birders throughout the US and that communities are continuing to invest in improved sites for birders and are purchasing habitat for additional destinations. They also report that local communities are becoming increasingly aware of the value of their natural resources and the need for their protection. Visitor surveys run by Fermata Inc. indicate substantial additional expenditure in the region by visitors from elsewhere as a result of the trail. A key lesson from the experience is reported to have been the 'absolute need for an organized, succinct, and well-defined strategic plan'. Similar initiatives have now been spawned elsewhere in Texas and in other states, having witnessed the success of the GTCBT, and are also proving successful (Eubanks, 2003; J.Herron, Texas Parks and Wildlife, pers.comm., July 2003; see also http://www.fermatainc.com/home.html).

As for zoos, a final socio-economic incentive for wildlife tourism operators to contribute to conservation is that this may assist them in attracting tourists (see earlier section on direct wildlife management). Some commercial nature-based tourism operators who make contributions to conservation are at least partially motivated to do so by their perception that this will help them to attract environmentally-aware clients, and incorporate this into their advertising (EWG, 1995; Higginbottom et al., 2001). Accreditation schemes like Australia's Nature and Ecotourism Accreditation Program (NEAPWG, 2000) are based on the premise that operators will be able to use accreditation (which at the advanced level, signifies that the operator makes contributions to conservation) to help market themselves. However there has been no

convincing research confirming the validity of this assumption. A key obstacle at this stage seems to be lack of substantial marketplace awareness of such schemes and their significance.

In addition to providing an incentive for conservation by private or community landowners, wildlife tourism may help motivate governments to acquire and manage land for conservation. Expected revenue from nature-based tourism has been reported to have provided an economic and political incentive for the creation of government-owned protected areas in many countries (Young et al., 1996; Preece and van Oosterzee, 1997; Goodwin et al., 1998). In many cases, the principal attraction involved is wildlife (see EWG, 1995; Isaacs, 2000; Higginbottom et al., 2001). In the USA, a major increase in participation in non-consumptive wildlife recreation is reported to have helped motivate interest in the protection of natural areas for the benefit of tourism (Vickerman, 1988).

Education of visitors about conservation

It is often stated that visitors, as part of their wildlife or nature-based tourism experience, can be educated to increase their conservation awareness and to behave in ways which have positive consequences for wildlife and/or their habitats (e.g. Duff, 1993; NBTAC, 1994; Parks and Wildlife Commission Northern Territory, *undated*). Education of wildlife tourists can result in changes in attitudes and/or increased knowledge that in turn may promote:

- more responsible behaviour towards wildlife and the natural environment, both in terms of minimising negative effects in the area where tourism occurs and more broadly
- subsequent involvement in wildlife conservation or research
- increased donations of money towards conservation
- increased political pressure on governments to achieve conservation objectives and/or –
- more satisfied customers and therefore more successful businesses

The effectiveness of wildlife interpretation in influencing visitors' conservation-related attitudes and behaviour is reviewed in Chapter 12. Here we cover some additional issues and literature that are specific to zoos and wildlife watching respectively.

Zoos

With 600 million visitors annually, zoos are unequalled by any other group of public, conservation-oriented institutions in their potential for public education. Further, the opportunity for close and carefully-managed encounters, plus the scope for fixed displays and talks, makes education generally easier to provide than in a free-ranging setting. Zoos have been described as 'the sleeping giant of the wildlife education field' (Kellert 1987).

The development of zoos as educational establishments has mirrored their change from menagerie to conservation park (see Chapter 3). Rather than being seen as merely biological curiosities, zoos nowadays strive to display their animals as part of the overall environment, and to utilise them in a variety of both formal and informal educational roles. The presence of animals is thus supplemented with a range of additional biological and conservation messages, and the relationship between animals

and their habitat has become a central theme of zoos' educational messages (Woollard, 1998).

Throughout the world, formal education is a prominent feature of zoos, with structured programs for schools, and increasing involvement in tertiary education. In a review of zoo education in the United Kingdom and Ireland, Woollard (1999) found that 71% of zoos had an education department, 73% taught visiting school pupils, with more than 750,000 pupils visiting these zoos in 1996.

However, over the last ten to fifteen years, informal education, where the visitor is unaware of being taught, has also increased in priority (Anderson, 1992; McGill et al., 1999). A recent survey by the Exhibit design and Education Committee of the European Association of Zoos and Aquaria (EAZA) showed that, apart from running the formal education programs for schools, most of the member zoos are committed to providing general information to visitors by having special events planned by their education departments, producing guide books and other publications, and utilizing signage and graphics. In addition, zoos worldwide are increasingly attempting to make this education fun, using interactive messages to encourage participation and thus investigation and knowledge gain (Turley, 1999).

However, assessing zoo education activities is difficult (Bartos & Kelly, 1998), and critics of captive animal displays suggest that their effectiveness is still unclear (Jamieson, 1985, 1995; Ollason, 1993; Scott, 2001). A number of studies has attempted to evaluate this (Broad, 1996; Kellert and Dunlap, 1989; Kreger and Mench, 1995; Ogden et al., 1993; Orams, 1996; Tarrant et al., 1997). In general, they found that exposure to wildlife in combination with some form of interpretation was associated with increased support for conservation of both the target species and wildlife in general (Moscardo et al., 2001, Chapter 12).

The type of education seems important in getting the zoos' conservation message across. For instance, Broad and Weiler (1997, 1998) found that the majority of visitors to Australian zoos learned more from keeper talks than from static displays. This finding is consistent with other studies, which also claim that interactive presentations are a more effective educational technique (Anderson, 1992; Simpkin, 1994; Moscardo, 1996, 1998).

Nevertheless, Mazur (1995) has questioned the effectiveness of zoo education programs by concluding that while visitors exhibited a significant level of awareness about endangered species and habitat destruction, it was still not clear that they had gained an awareness of conservation from their zoo experience. Similarly, Hutchins (1999) believes that zoos need to 'power up' their educational programs to increase public concern for, and interest in, wildlife and their habitats. He claims their zoo educational goals must be more directed, have specific outcomes, and that zoos should develop effective tools to measure the impact of their educational programs on people's attitudes and behaviour.

In particular, Mazur (2001) recommends that zoos should be striving to empower their visitors by both recounting the endangered species dilemma, and then providing tangible information about environmental advocacy to show them how their own actions can make a difference. Andersen (2003) supports this idea, particularly as it can, more effectively, link the *ex situ* experience in the zoo, with *in situ* conservation projects of the real world. In future, he claims, even small zoos can structure their educational messages in this way.

Wildlife watching

Many wildlife and nature-based tourism operators, whether from the private or public sector, incorporate environmental interpretation and education components. For many not-for-profit organisations involved in wildlife tourism, raising public awareness of environmental issues is their primary purpose (IRG, 1992; see Australian examples in Higginbottom et al., 2001). Senior staff of government conservation agencies in Australia felt that education of the public about conservation was the primary conservation benefit arising from wildlife tourism (Higginbottom et al., 2001). There are many anecdotal reports in the literature suggesting the power of some wildlife viewing experiences to influence people's attitudes (e.g. Box 6.9).

Box 6.9: Reported educational benefits of wolf watching at Yellowstone National Park, USA

'The word is out. For wolf watching at its best, come to Yellowstone National Park to see the most viewed wolf pack in the world. More than 30,000 people have witnessed the druid pack running wild in the Lamar Valley since their reintroduction in the spring of 1995 … Doug Smith, wolf project leader for the National Park Service, has seen people moved to tears by the sight of their first wolf in the wild. He believes that the benefit to wolf conservation has been tremendous.' (Richie Oberbillig, 2000; p. 26).

Government conservation agencies around the world also make varying levels of commitment to providing environmental interpretation, mainly in protected areas. For most commercial operators, commitment to education is a personal or business decision of the individual operator. However operators accredited under Australia's Nature and Ecotourism Accreditation Program (NEAPWG, 2000) are required to ensure that customers have access to well planned interpretation, accurate information and trained staff that have an understanding of nature and conservation issues. The recent development of a related accreditation system for nature guides (Crabtree and Black, 2000), initiated by the Ecotourism Association of Australia, is a further step to facilitate improvement of the standard of interpretation in nature-based tourism products in Australia.

A more informal type of education may occur simply by the existence of wildlife tourism. It has been observed that when tourism operators are present in a natural area, this can lead to enhanced perception of the value of the natural environment in that area by the public (D. Gschwind, pers.com.).

There is little published research on the effectiveness of wildlife interpretation (as opposed to environmental interpretation) in free-ranging settings, in contrast to the situation in zoos. Two Australian studies of visitors' responses in relation to sea turtle viewing at Mon Repos Conservation Park showed that exposure to interpretation resulted in attitudes indicating increased support for conservation of these turtles (Howard, 1999; Tisdell and Wilson, 2002). Other positive effects on conservation-related attitudes have been noted for the dolphin interpretation program at Tangalooma, Australia (Orams, 1995). A number of key informants interviewed by Moscardo et al., (2001) and Higginbottom et al., (2001) felt that the quality of wildlife interpretation available in Australia needs to be improved in order to realise much of its educational potential, and this situation is probably common worldwide.

Political action to support conservation

Zoos

Apart from their role in conservation education, zoos are rarely involved in lobbying for conservation, and where this has occurred it has usually been through their federations. For instance, the European Association of Zoos and Aquaria has recently launched a substantial public campaign against the bushmeat trade in Africa (EAZA, 2000). This lack of involvement apparently stems from both a belief that this is not a core role of zoos, and a reluctance to be seen as being political (MacAllister, pers. comm. 2001).

Wildlife watching

There is a number of situations in which wildlife-watching operators have lobbied for conservation of the natural resources on which they depend financially. In Tasmania (Australia), many wildlife tourism operators lobbied the government in opposition to both the proposed damming of the Franklin River and the process of clearfell logging in areas where wildlife operations occur (N. Mooney, Wildlife Management Officer, Tasmanian DELM, March 2000, pers. comm.). Purportedly as a result of lobbying from Great Barrier Reef tourism operators, the Australian government recently allocated additional funds into research on the Crown-of-Thorns Starfish that is detrimentally affecting the Reef. However a number of authors (e.g. Buckley, 2000a; van Oosterzee, 2000) have noted that unlike other commercial interest groups that depend on natural resources, the tourism industry generally seems to lack awareness of its dependence on natural resources and could be doing much more to lobby for conservation. On the other hand, several recent initiatives in the USA that have involved integrating conservation and wildlife-watching tourism and recreation have been motivated primarily by conservation interests, shown in Box 6.10.

Box 6.10: USA initiatives linking wildlife tourism and conservation

The United States National Watchable Wildlife Program/ Watchable Wildlife Inc.

This program involves cooperation between state and federal government land-management and conservation agencies, non-government conservation groups, local communities, and business and industry participants and has the goals of:

- Providing enhanced opportunities for the public to enjoy wildlife on public and private lands
- Contributing to local economic development
- Promoting learning about wildlife and habitat needs
- Enhancing public support for resources' conservation

The program's main initiatives have been to support the development of a network of wildlife-watching areas that incorporate interpretation, to produce a set of wildlife-watching guides (now available for more than half of American states), and to set up a communication network (Watchable Wildlife Incorporated, 2003; USDA Forest Service 2003). The aim of publications associated with the program like 'Providing positive wildlife viewing experiences' (Richie Oberbillig, 2000) is to provide wildlife tourism that increases people's appreciation of nature, and gives examples of wildlife-watching experiences that bring benefits in terms of visitor education and local financial benefits, both of which in turn are thought to have positive effects on public support for conservation.

Teaming with Wildlife is a legislative initiative driven by a coalition of more than 3,000 organisations and businesses (led by a non-government conservation organisation and with strong involvement from state conservation agencies). It aims to prevent species from becoming endangered and to nurture a new generation of wildlife stewards by supporting an increase in wildlife funding and related education and recreation programs to state fish and wildlife agencies. Secondary stated goals are to help meet escalating demands for outdoor recreation and education, and to assure an economic future for nature tourism and the outdoor industry (Teaming with Wildlife 2003). The key problem this initiative seeks to address is that currently there is no secure funding from the federal government for conservation of species unless they are fished or hunted (for which user-fees support conservation initiatives) or endangered. Largely as a result of this campaign, increases in funding have been secured over the last few years, although there is still no long-term funding system in place.

The National Wildlife Refuge System/Partners for Fish and Wildlife Program is administered by the U.S. Fish and Wildlife Service with the aim of protecting, enhancing and expanding areas for wildlife. One part of this program is the development of partnerships with private landowners to support the creation and conservation of wildlife habitats on private land. There is a major emphasis on the use of these sites for recreation and interpretation, particularly wildlife-related recreation and interpretation (US Fish and Wildlife Service 2003).

Conclusions and future directions

A growing trend to use tourism as a conservation tool has been reflected in: political initiatives, increased involvement of wildlife-watching operators in wildlife conservation initiatives, promotion of the use of private land for nature-based or wildlife tourism by governments, and growing emphasis of the role of conservation in zoos. Chapter 4 shows that this trend has also been reflected in hunting-tourism.

There is clearly a wide range of mechanisms through which wildlife tourism currently contributes to conservation, as summarised in Table 6.1. It is not possible to quantify these contributions, although an indication of their probable scale is given. We recommend further quantitative research in order to refine the conclusions and recommendations given here. It is however clear that within each form of wildlife tourism, and collectively, the contributions of non-consumptive wildlife tourism to conservation are significant and probably growing. There also seems to be considerable unrealised potential.

Table 6.1: Summary of contributions of wildlife tourism to conservation

Type of Contribution	Wildlife watching (free-ranging wildlife)	Zoos (captive wildlife in federated zoos)	Hunting
Direct wildlife management and research: *in situ*	• Significant numbers of mostly small-scale contributions though minority of operators.	• Minority of operators with mostly small-scale contributions, but growing.	• Substantial contributions by some hunting organisations and operators
Direct wildlife management and research: *ex situ*	• Very rare; a few cases involving captive breeding and reintroduction.	• A major formal objective, and the primary way that zoos contribute to conservation; occurs in all cases.	• Not significant
Financial	• Government charges provide contributions in a minority of cases. • Significant numbers though a minority of operators provide contributions. • Donations provided by tourists in a minority of cases; probable unmet potential. • Contributions are generally to *in situ* conservation, often by other organisations.	• Government charges do not provide contributions. • All operators provide contributions. • Donations provided by tourists in all cases. • Contributions are generally to *ex situ* conservation, within the zoo.	• Government charges provide significant contributions to conservation funding in some countries. • Some operators provide contributions.
Education	• Highly variable in quantity and quality between operators. • Potential to reach large numbers of people limited mainly to interpretive displays and signs in protected areas.	• A major formal objective; significant efforts in all cases. • Potential to reach very large numbers of people; far from fully realised.	• Variable. Extensive training of hunters included in many countries in Europe, including conservation-related issues.
Lobbying	• Small minority of cases.	• Small minority of cases.	• Significant involvement by some hunting organisations.
Socio-economic incentive	• Major contribution in terms of protected area creation especially in less developed countries. • Significant contribution in terms of private land conservation; though opportunities for increase in some regions. • Minor but growing incentive associated with marketing. • No strong socio-political imperative for conservation.	• Possible incentive associated with marketing, but little recognised. • Strong socio-political incentive for conservation in some countries.	• Major contribution in terms of private land conservation. • Strong socio-political incentive for conservation to legitimise hunting. • Important alternative to conventional farming in a number of countries.
General	• Generally a lack of formalisation and coordination, though growing; depends largely on individual efforts and motivation.	• Wildlife management and educational contributions formalised in coordinated way.	• Becoming more formalised among large hunting organisations.

Adapted from Higginbottom et al., 2003; supplemented by J.Bauer, University of Sydney, pers.comm. October 2003

The key strength of wildlife watching and hunting in relation to conservation potential is the economic incentive that this can create for the conservation of natural environments. Such links could be strengthened by wider quantification and publicising of the financial benefits derived from protected areas, and from an increase in government support to private landowners who are considering implementation of nature-based tourism (including well-managed hunting tourism, where considered politically acceptable). In the case of hunting, it appears that the large revenues obtained may also make substantial contributions to conservation (e.g. Decker et al., 2001, Chapter 4). The key strengths of zoos lie in their contributions to *ex situ* wildlife-management, and to intensive education of large numbers of people. However the extent to which these mechanisms are effective is yet to be established, and it has been argued that the former is an inefficient use of conservation funding. The coordinated approach to conservation efforts that applies to federated zoos should also help facilitate more efficient channelling of conservation efforts than generally occurs in the free-ranging form of wildlife tourism. Efforts by governments and industry associations (such as Australia's NEAP) to achieve greater coordination with and between nature-based tourism operators should be encouraged, although this is difficult since operators are diverse, numerous and typically small (see Chapter 13 for

a suggested approach to addressing this). There is considerable common ground between all three forms of wildlife tourism in terms of feasible mechanisms for contributing to conservation, suggesting that there may be benefits in zoos, wildlife-watching operators and hunting operators learning from each others' experience and achieving greater efficiencies through joint conservation objectives.

While there may be potential for increasing the contributions of non-consumptive wildlife tourism to conservation, there is a number of serious constraints on this potential. The most obvious is the limited capacity of tourists and operators to divert finances and time into conservation. Significant increases in contributions thus depend to a large extent on increasing the tourism income obtained by wildlife tourism operators, and using the existing potential more effectively. However this will still be constrained by the primarily commercial orientation of some wildlife-watching operators. Another major constraint is the lack of research in this area, particularly in terms of assessing effectiveness of existing mechanisms (especially education) in making a real difference to conservation, and in determining the relationship between participation of operators in conservation and their ability to attract customers.

A number of specific actions that can be taken to enhance the contributions of wildlife tourism to conservation are given by Tribe (2000) and Higginbottom et al., (2001). These include:

- greater use of various economic instruments (see details in Chapter 8)
- raising awareness of the potential economic benefits associated with wildlife tourism
- finding ways to 'reward' operators (in ways that enhance their business success) who support conservation
- improving effectiveness of accreditation programs
- support for development of profitable wildlife-tourism attractions designed to support nature conservation, further development of donation systems
- making increasing use of volunteers
- providing support to landowners who wish to develop responsible wildlife tourism
- education of the tourism industry

The success of these sorts of initiatives will depend to a large extent on increased mutual understanding and respect between conservation and tourism stakeholders (cf Vaughan, 2000). These should occur in the context of a strategic and coordinated approach, involving cooperation between different types of wildlife tourism operators and other conservation stakeholders (see Chapter 13). Such an approach should allow wildlife tourism to more fully realise its apparently substantial potential to contribute to conservation.

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Chapter 7

The Host Community and Wildlife Tourism

Georgette Leah Burns

Introduction

The growth and popularity of certain forms of wildlife tourism (discussed in Chapter 1) poses increasing opportunities and threats for host communities. Wildlife tourism depends on a viable resource (wildlife), an interested market (tourists) and accommodating locals (hosts). Wildlife tourism activities have many potential impacts on a host community, and the host community can impact on wildlife tourism activities. Any increase in wildlife tourism is likely to be accompanied by a growth in the number of people affected by it, and thus a challenge for the wildlife tourism industry is to maximise cultural, economic and social benefits for the host community while minimising any adverse effects.

This chapter examines the wildlife tourism stakeholders who constitute the host community. The chapter explores impacts of the host community on wildlife tourism, and of wildlife tourism on the host community, and the manner in which such impacts are managed. Of particular interest is the degree and type of involvement of hosts in wildlife tourism, and how host attitudes and values shape both the nature of wildlife tourism and ultimate sustainability of the wildlife tourism product. Examples discussed illustrate some of the barriers to effective host participation in planning, designing and managing sustainable wildlife tourism, and assist with identifying key costs and benefits. Solutions posed suggest possible ways forward for positive host relationships with wildlife tourism.

Wildlife tourism: what makes it different for hosts?

While some issues raised by wildlife tourism for host communities are the same as those raised by other forms of tourism, some are very different. One difference relates to the pre-tourism values that hosts place on particular wildlife, as these can affect host perception of, and enthusiasm for, a tourism venture. For example, if the wildlife is used as a food source, such as when the Alaskan Inupiat hunt whales (Chance, 1990), then the locally assigned value may be high. In situations where the wildlife is perceived as disruptive to host lifestyles, such as when gorillas destroy crops in Uganda (Lepp, 2002) or lions prey on cattle in Kenya (Shackley, 1996:92), then the value may be negative. If the history is of little interaction between the hosts and the wildlife, such as with the residents and dingoes on Fraser Island in Australia (Burns and Howard, 2003), then the value is more likely to be neutral. Very rarely, prior to the development of wildlife tourism in a region, do we find wildlife valued solely as an attraction. Thus, the success of wildlife tourism, or even its existence, may depend on changes to values placed on the attracting wildlife. Altering host views can be a major challenge for sustainable wildlife tourism since valuing a particular species as worthy of preservation, for example, might be strongly against beliefs previously held by members of the host community.

Host relationships with wildlife tourism differ between more-developed and less-developed countries. However, globally, wildlife tourism is often connected with, or even a consequence of, the desire to conserve and protect a particular species: a further

factor distinguishing it from other types of tourism for hosts. The concepts of conservation and sustainability carry with them a particular ideological framework and worldview, the existence of which should not be assumed in the host community.

Conservation and wildlife tourism

Wildlife tourism is often implemented in destinations where there is a desire to conserve a particular species and a need to make conservation economically viable. In such situations, tourism may form part of an integrated conservation and development programme (ICDP) as found in many less-developed countries (e.g. Box 7.1). Alternatively, the tourism may exist first and lead to a desire for wildlife conservation and preservation.

Box 7.1: CAMPFIRE in Zimbabwe

The Communal Areas Management Program for Indigenous Resources (CAMPFIRE), a community-based natural resource management (CBNRM) approach, was instituted in Zimbabwe at a time when an increasing rural population was causing competition over land between agriculture and wildlife (Scheyvens, 2002:73-81). CAMPFIRE aims for people to continue farming whilst collecting profit from wildlife management (Nyamaphene, 1985). Consumptive wildlife tourism, in the form of hunting, is encouraged in the program and local villagers receive 70% of the licence fees that contribute to individual household and shared community needs such as schools and health clinics (Heath, 2001:159; Gunther 1999).

When contrasted with some East African game parks, CAMPFIRE appears to be a more satisfactory arrangement for the host community. In Kenya, for example, the indigenous Masai have faced problems as a result of higher values being placed on the tourist-attracting wildlife than on the cattle the Maasai depend on for their livelihood. Maasai lose cattle to lion predation (Shackley, 1996:92), and are further marginalised as their lands are confiscated for bean and hop production (Fratkin and Wu, 1997). A problem with CAMPFIRE though is that decisions about resource management are most frequently made outside the local communities, who are supposed to benefit most from the program, thus restricting opportunities for community empowerment (Hitchcock, 1997:89).

Lessons relevant for wildlife tourism about host communities can be learnt from literature on conservation. A central 'community ethic' (Adams and Infield, 2003:178), for example, dominating much thinking about conservation and practice in less-developed countries, stipulates that the existence of beneficial conservation and development projects depends in part on the extent to which local people are engaged in project activities (Hitchcock, 1997:90). That is, conservation activities have greater potential for success 'if local people are allowed to take part in formulating and implementing policies and programs that incorporate safeguards against abuses and that place strong emphasis on equity and social justice' (ibid).

There is certainly potential for a positive relationship to exist between tourism and conservation (Chapter 6, Hall 1998). Tourists can be attracted by the types of features deemed worthy of conservation, and willingly pay to experience them. Possible conflict arises from expectations that the host community will accept the tourism venture as enthusiastically as the tourist.

The host community

Frequently referred to in tourism literature, 'host community' is often presented as synonymous with 'residents', 'locals', 'public' or 'citizens.' Such terms, however, rarely distinguish between hosts as suppliers and tourists as users of tourism resources

(e.g. Bright and Pierce, 2002). An important characteristic of the host community is that it does not constitute a unified whole, and its constituent groups of stakeholders and individuals are rarely homogenous (Ashley and Roe, 1998:7). Divergent interests exist amongst host community members (Agrawal and Gibson, 1999, Burns and Howard, 2003) and recognition of this is essential for tourism planners, developers, and managers. Consequently, when comment is made on host support, or otherwise, it is important to recognise that variations in level of support may exist within the same community (Taylor and Davis, 1997; Mason and Cheyne, 2000).

Taking a broad view, the host community encompasses all aspects of wildlife tourism not covered by either the wildlife or the tourists. It could be seen as comprised of many stakeholder groups at the supply end of tourism; including government policy makers, non-government organizations (NGOs), and tourism operators. Such a definition, however, is too wide to allow meaningful examination and for the purpose of this chapter the host community refers to local people, including residents and indigenous groups, living in or adjacent to wildlife tourism destinations. An examination of the engagement of government and business with wildlife tourism can be found in Chapter 10.

Residents are the people living in wildlife tourism destinations. Locals may be residents, but also include people living near the boundaries of the tourism destination. Indigenous people may be both residents and locals in a wildlife tourism setting. In some cases, indigenous issues in wildlife tourism are similar to those of other stakeholder groups, although there may be different ramifications for their livelihood and standard of living.

Overlooking the hosts

Although a fundamental component of any tourism system, the host community is frequently overlooked in the wildlife tourism literature (e.g. MacLellan 1999, Matt and Aumiller 2002), and it seems likely that this is often paralleled in practice. The importance of recognition of a host community is exemplified when we consider that few wildlife tourism destinations exist without repercussions for a host community. Antarctica may be one of few exceptions. Fennell and Dowling (2003:338) propose that 'the region is perhaps the best managed site in the world', largely due to its independent political status and heavy reliance on industry self-regulation. However, the assertion that 'this model has application in other world regions' (ibid) should be treated with caution owing to the highly unusual lack of residents, nearby locals and indigenous people at this destination.

Although literature on the host community has long been an essential part of the general tourism discourse (e.g. Murphy, 1985; Pearce et al., 1996), literature focusing on wildlife tourism hosts is minimal. Exceptions include Ashley and Roe's (1998) development agency perspective; Mvula's (2001) report on a Zambian National Park; Muloin et al., (2001) assessment of indigenous wildlife tourism in Australia; and Burns and Sofield's (2001) survey of host involvement with Australian wildlife tourism. Given this youthful stage in the field's discourse, it becomes not just informative but also imperative to draw on literature from the wider field of tourism - whilst not losing sight of the important differences of wildlife tourism. Recent texts especially relevant to this enquiry include those examining the relationships between tourism and hosts, such as Richards and Hall (2000), Scheyvens (2002), and Sofield (2003).

The involvement of hosts

Members of the host community may be involved directly or indirectly with wildlife tourism, or not involved at all. Direct involvement may take the form of paid employees, managers, owners and operators, or unpaid volunteers. As employees in wildlife tourism, hosts frequently work as guides (Shackley, 1996:83; Burns and Sofield, 2001:19, Box 7.2) in recognition of their local knowledge. Burns and Sofield (2001) also found that a large percentage of host community involvement in Australian wildlife tourism takes place on a voluntary basis.

Hosts can also be directly involved through community-based tourism ventures which, ideally, offer a higher degree of control over the activities taking place and a greater proportion of the economic benefits than more indirect forms of involvement (Scheyvens, 2002:10, Box 7.1). Hosts may be indirectly involved when, for example, they are recipients of distributed compensation revenue from tourism, but otherwise have no contact (e.g. Adams and Infield, 2003). Hosts may also collect lease money from tourism operators who bring tourists onto their lands (Scheyvens, 2002:10).

Host involvement depends upon the wildlife tourism context (Burns and Sofield, 2001), and is influenced by factors encountered in other forms of tourism. These include:

- Level of education/skills/training
- Extent of employment opportunities
- Access to capital
- Number of tourists, and/or access to them
- Host awareness of outcomes from tourism
- Host interest in involvement (i.e. the assumption should not be made that all hosts desire involvement with tourism)
- Access to information, power and resources in relation to other stakeholders
- Previous experiences with tourism that may motivate hosts to avoid, or embrace, direct involvement (Scheyvens, 2002:9-10; Mvula, 2001:402-403).

Additional factors found to be particularly relevant to indigenous involvement include:

- Lack of education and funding for indigenous tourism programs
- Limited infrastructure
- Negative attitudes and stereotypes
- Lack of commitment and self-governance by indigenous people
- Cultural and religious traditions
- Government dependency (Muloin et al., 2001:59).

A case study summarising indigenous Australian involvement with wildlife tourism is provided in Box 7.2.

Box 7.2: Aboriginal involvement in Australian wildlife tourism

In Australia, tourism offers indigenous communities the opportunity to gain economic benefits from wildlife and to communicate indigenous knowledge and understandings of wildlife to visitors. Although indigenous peoples have limited involvement in wildlife tourism, indigenous land-ownership and indigenous knowledge of country and wildlife indicate the potential for growth in this area. The relationship between indigenous peoples and Australian wildlife includes traditional cultural, and spiritual dimensions, as well as ongoing use of wildlife for food and artefacts, and more recent commercial uses including wildlife farms and tourism. There are few indigenous tours with a focus on viewing wildlife species in free-range settings though, in northern Australia, there are some indigenous-owned boat tours and resorts with a focus on wildlife. Indigenous-owned wildlife tourism ventures are based mainly within National Parks (e.g. Kakadu, Geikie Gorge), at nature-based resorts (e.g. Kooljaman), on Aboriginal lands (e.g. Arnhem Land, Yalata Aboriginal Lands) and at wildlife farms. Some zoos and wildlife parks employ indigenous staff as guides, wildlife keepers and cultural presenters. Wildlife parks with a policy on indigenous employment and cultural interpretation include Alice Springs Desert Park (NT) and David Fleay Wildlife Park (QLD). Consumptive indigenous wildlife tourism includes recreational fishing and safari hunting of feral animals on Aboriginal lands, emu farms, a crocodile farm, and bush tucker tours gathering food resources such as witchetty grubs and mud crabs. Aboriginal communities benefit from employment, fees for guided tours, selling wildlife products (e.g. emu cream and leather), trophy fees and licence fees from fishing and hunting operations (Muloin et al., 2001).

Host communities, especially those in less-developed countries, rarely initiate tourism development without input from an external source such as a local NGO, an international conservancy agency, or a private tourism operator (Scheyvens, 2002:10). Such input is not always exclusively financial and the external source may be responsible for initiating the idea of tourism (e.g. Burns, 2003; Sofield, 2003).

Host involvement may take place at different stages in the development of a wildlife tourism facility and take different forms in those stages. As Mvula (2001:403-404) discovered in Zambia's South Luangwa National Park, the local community initially had little direct involvement in the development and management of tourism in the area, but later began to take some control and initiate projects - such as encouraging tourists to visit villages. In the wider literature the 'vital role of community involvement and ownership at all stages of tourism development' (Baum, 1996:149) has been stressed. It is also argued that the type of involvement host communities have can shape the benefits and costs they experience from tourism (Ashley and Roe, 1998), and may have implications for the sustainability of a wildlife tourism venture.

The relationship between hosts and sustainability

Sustainability should be a goal for all wildlife tourism ventures (Chapter 1), and the role of the host community must be acknowledged in this because such sustainability is dependent, at least in part, on support from the hosts. 'For tourism to survive … it needs support from the area's residents' (Ap and Crompton, 1998:120) and, for tourism to avoid causing its own destruction, sustainable tourism must be embraced as a valued concept by all stakeholders (Wahab and Pigram, 1997).

Ensuring a wildlife-tourism attraction is sustainable, from the perspective of the host community, requires an understanding of the interplay of elements affecting both the perception of, and support for, that tourism (Burns and Sofield, 2001). For example, hosts interact with the wildlife tourist and the wildlife resource in varying ways, and this interaction can have implications for the sustainability and long-term viability of the wildlife tourism.

A key to sustainability may lie in keeping the benefits from tourism local (Lepp, 2002:219) and such benefits must be perceived by hosts to outweigh any costs or disadvantages. One of the requirements for sustainable use of wild species, for tourism or other purposes, is that there are positive economic incentives for people living near such populations to conserve them (Prescott-Allen and Prescott-Allen, 1996; Adams and Infield, 2003:178). However, while economics plays an important part, sustainability is not ensured simply by such incentives.

The United Nations Local Agenda 21 (LA21) policy is useful to consider in this context of community and sustainability. Although LA21 did not initially name tourism, it has important ramifications for the tourism industry and for sustainability involving the host community. Involvement of hosts can, for example, take the form of partnerships as a way of ensuring cooperative management, and such formation of partnerships is frequently linked with sustainability (e.g. Mayo, 1997; Stolton and Dudley, 1999). LA21 challenges 'local authorities to adopt ways to involve their communities in defining their own sustainable futures' (Smith, 2001:191) and suggests that sustainable development can only be achieved 'through planned, democratic, cooperative means including community involvement in decisions about the environment and development' (Jackson and Morpeth, 1999:3). It tells us that 'tourism development strategy should protect local culture, respect local traditions and promote local ownership and management of programs and projects, so as to foster community stewardship of the natural resource base' (Smith, 2001:191). Box 7.3 provides an example of a sustainable wildlife tourism venture that benefits from host involvement and support.

Box 7.3: People and penguins in Australia

Of the ten Little Penguin (*Eudptula minor*) colonies that existed on Victoria's Phillip Island at the time of European settlement in 1850s only one remains (Harris, 2002:239). Visitors were first drawn to the penguins in the 1920s to watch what is now known as the nightly 'penguin parade' attracting large tourist numbers (520,000 in 2001) (ibid:240). The attraction was controlled by the local shire from the mid-1950s until 1981 when the Victorian state government took over and established a committee to oversee management of the area (Newman, 1992).

The host community has been involved with this wildlife tourism attraction in many ways:

- The first boat trips for tourists to the island, in the late 1920s, were organised by island residents.
- Two members of the host community are always on the management committee of twelve.
- The attraction is the island's largest employer for the host community.
- Tourism income is used to educate island residents about the wildlife-friendly care of domestic pets.
- Management is aided by volunteers engaged in a variety of programs including interpretation services, weed eradication, rescuing wildlife, seed collection and propagation.
- A regular column in the local newspaper is designed to keep the host community informed about tourism on the island (PINPBM, 2000; Harris, 2002).

Since 1992 the state government has been buying back houses on Phillip Island in what is 'perhaps the first, and only, example in the Australian context of an instance where a (human) community has been essentially displaced for the good of a particular animal species' (Harris, 2002:244).

Host perceptions of wildlife tourism: attitudes and values

Achieving the goal of favourable community support for the tourism industry requires an understanding of how residents formulate their attitudes toward tourism (Jurowski et al., 1997:3).

Both the actual and perceived impacts of wildlife tourism will influence the attitudes of the host community and consequently affect sustainability (Burns and Sofield, 2001), as will the values hosts attach to wildlife. Human attitudes are known to be consistent with human behaviour (Fishbein and Manfredo, 1992; Manfredo et al., 1995); thus identification of host attitudes toward wildlife tourism will bring us a step closer to understanding host behaviour in the wildlife tourism setting.

Research on host attitudes toward tourism and sustainability has focussed on the way economic benefits can positively affect host perceptions of tourism, while social and environmental issues generally have a negative effect (Liu and Var, 1986; Ap, 1992; Prentice, 1993). Host attitudes, however, depend on a variety of circumstances and characteristics including sociodemographic attributes, economic dependence on tourism, spatial proximity to attractions, attachment to the traditional culture of the area (Uriely et al., 2002:859), and feelings of control in relation to the attraction (Ryan, 2002; Scheyvens, 2002; Sofield 2003).

Pearce (1980) found that hosts living in urban areas reacted more positively to tourists than did those living in more rural areas. This offers an important lesson for wildlife tourism, which is frequently based in rural areas where wildlife is situated (with some zoos generally being a notable exception). Mvula (2001:398) discovered something similar in the context of wildlife tourism in Zambia, where hosts living closer to tourist facilities had more opportunities for employment and tended to have a more positive attitude towards the tourism. The message here is probably less related to spatial proximity than to access to the perceived advantages from tourism. In Mvula's case, the more directly individuals benefited from the tourism, the more inclined they were towards a positive attitude. Thus the facilities do not necessarily need to be close to the host community, but the host community does need to be involved in beneficial ways to increase their likelihood of a positive attitude.

'Resident evaluation of the impacts of tourism and resident support for tourism are dependent on what they value' (Jurowski et al., 1997:3) and thus host attitudes may also be shaped by the values placed on wildlife both before and during its use as a tourism resource (for further information on values associated with wildlife see Decker and Goff, 1987; Kellert 1996; and Duda et al., 1998). Because host interaction with wildlife and wildlife tourism ranges over a broad spectrum, different communities can be expected to have different attitudes toward wildlife influenced by their different values. These attitudes may range from care, concern and conservation to open hostility (Burns and Sofield, 2001:10).

A host community may regard wildlife as a valuable resource to be exploited either for self-consumption or for commercial consumption. Such activities are often in direct conflict with the utilisation of the same wildlife for tourism purposes, especially if the tourism is conservation based. For example, African host communities and mountain gorillas have not always existed in the type of (relatively) harmonious relationship upon which current wildlife tourism is based. Gorillas have traditionally been hunted for food and threatened by poaching, encroachment by farmers, livestock grazing, and wood and bamboo cutting (Butynski and Kalina, 1998:296).

The host community may also have an integrated relationship with wildlife in which certain animals are perceived as vital to their social, cultural, and psychological well-being and play an important ceremonial and symbolic role. The traditional totemic value system of Australian Aboriginal communities is one of many examples. Activities of such communities and their relationship with wildlife may be incorporated into tourism, as is the case with some indigenous tourism in Australia (Box 7.2) and hunter-gatherer tourism in Thailand (Cohen, 1996).

Alternatively, a hostile relationship may exist between the host community and the wildlife; for example, farmers concerned about wildlife populations competing with their livestock for pastures, or damaging their crops (such as in Kenya where 80% of wildlife spends at least some time outside protected areas (Shackley, 1996:95), or even in more developed countries with abundant wildlife such as Australia). At the other end of the scale, there may be indifference by host communities to the wildlife around them. This appears to have been the case on Phillip Island in Victoria during the late 1800s when indifference almost led to the demise of the Little Penguin population (Box 7.3).

There is also the issue of conflict between hosts and tourists where a significant wildlife attraction could bring greatly increased numbers of visitors to the area (such as seasonal whale watching at Byron Bay, New South Wales). Conflict may also exist between hosts over wildlife resources and their utilisation for tourism.

The support needed from host communities for tourism to be sustainable (Reynolds and Braithwaite, 2001:32) is dependent on a variety of factors affecting host values, attitudes, and perceptions of impacts. Thus there is a need to look for ways to obtain this support for the benefit of all stakeholders in the wildlife tourism context.

From involvement to participation and collaboration

There is increasing recognition that a key element of natural resource management is the understanding and incorporation of the differing perspectives of stakeholders (Duffus and Dearden, 1990; Wright, 1998), and this parallel can be drawn with wildlife tourism. Probably the most critical conflict in more-developed countries exists between interest groups who give priority to the protection of natural resources and those who prioritise the quality of the visitor experience or the financial interests of tourism operators (Green and Higginbottom, 2001). In less-developed countries, conflicts between host communities and conservation or tourism interests are often the most prevalent (e.g. Box 7.1). Finer scale differences in perspectives are also likely, such as between different recreational user groups with differing aspirations for wildlife viewing (Manfredo et al., 2002).

One approach discussed in the literature as a way of encouraging support whilst incorporating different perspectives is through active stakeholder participation in all phases of wildlife tourism. According to Shackley (1996:82), ‘One of the clearest things to emerge from two decades of debate about managing the interface of tourism and conservation has been that the success of any project depends on local community participation’. Although literature increasingly recognises the importance and relevance of stakeholder participation in the management process (Stolton and Dudley 1999), full participation of all stakeholders has enormous ‘political economic complexity’ (Adams and Infield, 2003:187) and is not always as straightforward as anticipated. As O’Riordan (1976:258) stated nearly twenty years ago, ‘participation …

is a slippery concept that appears to be socially desirable but is constantly endangered by malpractice.' The desirability of participation has increased over time and, it is hoped, the instances of malpractice are diminishing.

The term participation, like empowerment, is associated with neopopularist and sustainable-development perspectives that focus on people in local contexts and on small-scale, bottom-up strategies for their development (Scheyvens, 2002:51). Coupling this with wildlife tourism is not always easy, especially in situations where the industry is dominated by non-local investment and foreign conservation ideals. As a form of host participation, the 'park neighbour principle' is the most common approach to community conservation in Africa (Adams and Infield, 2003:186) and has potential application in other countries where wildlife tourism occurs in parks and protected areas. Vesting property rights in a resource's nearest neighbours strengthens their incentives to become positively involved (McKean, 1996).

Participation needs to occur equitably at all levels and between all stakeholders. To assist this, effective institutions must emerge that secure transparent engagements between stakeholders (Agrawal and Gibson, 1999). Such institutions may be community-based, but not all community-based arrangements emerge from the local community in the bottom-up type strategies espoused by neopopularist theory (e.g. Box 7.1). Sofield (2003:257-284) uses an example of village ownership of ethnic tourism in Vanuatu to illustrate how indigenous hosts can combine bottom-up (community support) with top-down (government support) inputs to create a sustainable tourism venture.

Collaboration between stakeholders is also discussed, often in connection with participation, in the general tourism and conservation literature and '… there appear to be many emerging models which place decision making and control for tourism in a collaborative arrangement' (Fennell and Dowling, 2003:333). Fulton et al., (2002) offer an example where collaborative planning is used to promote partnerships between and within stakeholder groups. Ideally, a shared stakeholder-vision reflects different values but aims to reach a consensus where possible (ibid). The success and practicality of this type of arrangement depends on numerous factors, but of key importance are the scale of the tourism and the range of formal and informal processes (e.g. planning committees, public forums and workshops, community surveys).

Participation and collaboration are not just futuristic ideals. Stakeholder participation in wildlife/nature based tourism is advocated in some practice, particularly in less-developed countries, and effective host-community involvement in this is crucial. There is, however, a number of barriers to turning this rhetoric into a widespread viable and practical reality.

Barriers to satisfactory host engagement with wildlife tourism

Barriers to host-community involvement and participation in wildlife tourism are similar to those identified in other forms of tourism and/or development, yet there are also some differences. A vital challenge for the industry lies in identifying these barriers and then finding ways to overcome them.

Key factors influencing host-community involvement in the tourism industry were outlined earlier; however, the World Bank (1996:23–28) identifies additional factors that may undermine effective community participation in planning processes. Included are poverty, rural settings, illiteracy or language barriers, local values and culture, legal and tenure systems, interest groups, and concerns over confidentiality.

A significant barrier to the sustainability, and success, of wildlife tourism based on conservation goals lies in the fact that hosts are not always allies in such goals. Conflict between indigenous Australians and conservationists over construction of a road through an ecologically important rainforest area in Queensland (Anderson, 1989) offers an example of this. Protest against the construction of a tourist facility on Hinchinbrook Island, also in Queensland (Parker, 2001:240), is another.

Lack of education can be a substantial barrier to participation and employment in the tourism industry, and one that is frequently worse for women than men. In the case described by Mvula, fewer women were employed in the tourism industry than men owing to the women's lower level of education (2001:400). A further factor affecting differential gender-access is related to cultural norms that may impose barriers to women's employment outside the home in some societies (e.g. Burns, 2003).

Lack of capital can also be a barrier for host communities, particularly restricting them from owning or operating a tourism venture. Therefore, it is common for locals to be employees, or even volunteers (Burns and Sofield, 2001) rather than owners or operators. Again, Mvula's (2001) case study provides an example in which the tourism facilities are largely owned and managed by non-locals, and consequently the hosts lack control in the industry. In many tourism businesses, especially in less-developed countries, local people are not employed in the more senior and better-paid jobs (e.g. Mvula, 2001; Burns, 2003). As Mvula (2001:399-400) found, 'locally recruited employees tended to occupy the more menial positions' and local workers were paid less than others. Access to capital is not the only reason for this situation and power relations are also at play. The roles of power in relationships between tourism stakeholders clearly influence the way in which stakeholders have access to, and manage, the industry (Stonich 1998).

The willingness of other stakeholders to incorporate the host community in planning and management processes is a further important factor. Perceived disadvantages of such incorporation include diminished control for some stakeholders and time delays in decision-making processes that may result in delayed income, added costs to projects, and unrealistic community expectations (Pain, 1989:27).

As a result of these barriers, input into planning processes tends to be restricted to certain sections of the community. The outcome of such processes then is likely to benefit some members of the community over others, leaving the potential for conflict between different sections that could jeopardise sustainability. This restriction might not be recognised by those responsible for the planning process, as it is not uncommon for the community to be erroneously treated as homogenous by policy makers (Fennell and Dowling 2003:333). Consequently, the many disparate voices, and the positions they hold, may 'act as one of the main constraints to effective policy development' (p333). In addition, the complex composition of heterogeneous communities creates difficulties for operationalising the type and level of community involvement envisaged in LA 21 (Jackson and Morpeth, 2000:119).

As host participation and support are vital ingredients for the sustainability of wildlife tourism it is important to find ways of overcoming the barriers identified. This challenge may be more difficult for indigenous hosts (Johnston, 2003) and in less-developed countries where the barriers often seem more pronounced.

Potential benefits of host engagement with wildlife tourism

There are many potential benefits of wildlife tourism for hosts and of hosts for wildlife tourism. However, identifying 'costs' and 'benefits' needs to be acknowledged as essentially a subjective exercise. Something perceived as a benefit by one stakeholder may be perceived as a cost by another; thus any values associated with changes in the host community should be determined by the members of that community and not by outsiders who might hold very different world views. Perceived local benefits received from tourism usually fall into such categories as employment, income, diversification of economic base and/or business opportunities, upgrading of infrastructure, visibility, and cultural benefits (Ashley and Roe, 1998:11; Edgell, 2002:17).

If profits from wildlife tourism remain with the host community, they can provide beneficial health care, education and food, and may contribute to the reduction of poverty (Mvula, 2001:394). If the wildlife tourism is sustainable, it can provide long-term revenue generation, assist conservation and raise the living standards of host communities (Ashley and Roe, 1998:16; Mvula, 2001:394). Most hosts who receive a direct benefit do so as a result of their own efforts; for example, through employment, or making handicrafts for sale. Those benefiting indirectly may be recipients of revenue distributed to the community (Mvula, 2001:398). The introduction of wildlife tourism to a region may also provide benefits to existing local businesses, as well as the creation of new businesses run by locals, jobs, publicity, and increased environmental awareness (Ashley and Roe, 1998:12; Mvula, 2001:398).

Wildlife tourism may bring considerable foreign exchange into a country (Chapters 1 and 8). It is rare, however, especially in less-developed countries, for this to result in tangible benefits at a household level (Mvula, 2001:398) due to 'leakage' of tourist expenditure from the locality visited and the capture of financial benefits by a small elite within a community (Ashley and Roe, 1998:11-12). Although tourism can diversify the economic base, if there is no existing base it can become the sole industry upon which a community relies for income. The hazards of such a dependency on tourism, regardless of the form, have been well documented (e.g. de Kadt, 1979; Britton, 1981).

Wildlife tourism has particular potential to stimulate peripheral rural economies, as its attractions are frequently located in remote areas - such as Kakadu National Park in Australia. Kakadu is co-managed by local indigenous people and the government-run Parks and Wildlife Service. This arrangement has brought benefits to the host community; however, it is also accompanied by costs and liabilities (Hall, 2000).

Situations where hosts effectively engage with wildlife tourism, and/or are satisfied in their relationship with it, hold benefits for wildlife tourism (e.g. Box 7.3). Host communities can positively contribute to both tourist experiences and species conservation via their often in-depth and extensive local knowledge; thus increasing the potential of a sustainable outcome.

Edgell's (2002:18) proposal that residents must determine whether the benefits are worth the costs involved presupposes that they are in a position allowing them enough power in the tourism industry to make that determination. While hosts in more-developed countries may have this advantage, hosts in less-developed countries often do not. Ultimately hosts and other stakeholders need to be aware of the potential benefits, as well as the potential costs, before embarking on a wildlife tourism venture.

Problems that may result from host engagement with wildlife tourism

Costs or problems associated with wildlife tourism for hosts, and with hosts for wildlife tourism, are likely to be similar to those found for other forms of tourism and development. It is incorrect to assume that they will be perceived in the same way by all stakeholders. Also, like the barriers discussed earlier, problems are likely to be exacerbated in less-developed countries and for indigenous people. Disadvantages of wildlife tourism for host communities include dispossession (displacement/ resettlement), loss of access to resources, competition and conflict over the distribution of funds, asymmetrical power relations, degradation of natural environments (Mvula, 2001:394), and increasing commodity and property prices which can disrupt local lifestyles and increase the economic burden on local people (Butynski and Kalina, 1998:305).

Wildlife tourism may intrude upon hosts at the destination, and may even displace them. While few communities have been displaced solely in the name of tourism, displacement has often occurred in the name of conservation (e.g. in the Yosemite National Park in America and the Royal Chitwan National Park in Nepal), and in connection with other forms of development (e.g. the Three Gorges Dam project on China's Yangtze River). Examples of hosts being displaced and dispossessed of their land when a wildlife attraction occurs in a location that becomes designated as a conservation area, and local use of it is then prohibited, are plentiful. Many biodiversity conservation programmes in Africa, for example, have tended to result in the dispossession of local people and/or prevent them from 'engaging in resource procurement activities' (Hitchcock, 1997:82; Norton-Griffiths, 1998). This in turn generally serves to exacerbate problems of poverty and resource stress, especially in situations where compensation for such displacement and loss of access is perceived to be inadequate (e.g. Box 7.4).

Box 7.4: Mountain gorilla tourism in Africa

A study of the Mgahinga National Park (MNP) in Uganda by Adams and Infield (2003) shows that while the host community has mixed views about benefits of the park, most are deeply resentful of its impacts on their lives. Prior to the park's establishment in 1992 (to assist with the conservation of the mountain gorilla, *Gorilla gorilla beringei*, and promote wildlife tourism), 272 households in the area contained 1700 people and a further 680 cultivated within the park boundaries. Some compensation was paid by the Uganda National Parks for resident relocation, but the recipients were not content with the amount or the way it was distributed (ibid:178-179). Some of the park revenue generated from tourism was directed at projects, such as the construction of roads and classrooms, designed to benefit the host community (p183-184). However, this has not satisfied the host community and their attitudes remain negative as they perceive the costs (such as loss of agricultural land) to outweigh the benefits (p184). The MNP suffers from characteristic problems with such payment schemes; that is, lack of transparency, corruption from within the revenue collection and administration chain, and 'institutional unsteadiness' (Archabald and Naughton-Treves, 2001), which all limit the effectiveness of payments meeting conservation goals (Adams and Infield, 2003:184) and host community expectations.

Alternatively, the Bwindi Impenetrable National Park (BINP), created in 1991 for the same purpose as MNP, offers a more positive example for gorilla conservation and host community satisfaction (Lepp, 2002). The forest within BINP was an important source of income (timber and gold mining) and subsistence (hunting and gathering) for the host community and removing these resources created hostility towards the park and its staff (ibid:213). 'Indicative of this hostility was the penchant for referring to the early park staff as baboons, an animal loathed for its destructive crop-raiding tendencies' (p213). A plan for tourism in BINP included a

commitment to encouraging host participation and members of the community were hired as guides, trackers and porters; park infrastructure development used local materials and labour; and tourist accommodation provided employment opportunities and linkages to the local economy through the sale of food and handicrafts (p214). Revenue sharing and community extension work were used to widely disseminate benefits, and host community members were given the power to determine which projects would be funded from the shared money. Since BINP's creation, wildlife tourism has been economically successful for the Uganda Wildlife Authority, and a conservation success ending the threat of logging and mining to the gorilla population (p215). Villagers who used to chase gorillas away, are now reportedly 'excited to have them there' because of plans for a campground and hostel, and expectations of economic benefits from wildlife tourism (p216). Further, a CARE study found that the villagers had grown more positive in their attitude toward the park (cited in Lepp, 2002: 217-218).

Involuntary relocation of people with strong ties to the land as, for example, indigenous people nearly always have, has almost without exception resulted in a reduction in the standards of living of those moved (Hitchcock 1997:88). 'While some of the people may temporarily be better off, over the longer term conditions can be expected to worsen,' partly because of increased competition for natural resources and for employment opportunities (ibid). Resettlement out of conservation/tourism areas can also lead to an increase in interethnic tensions and community conflict (ibid).

A further problem commonly associated with community involvement with tourism centres around the distribution of financial revenues. A major problem identified with integrated conservation and development programs (ICDPs) is that they 'generally underestimated the costs of compensating people for their losses and have not been able to come up with strategies that restore livelihoods or replace income lost as a result of project implementation' (Hitchcock 1997:86). Emerton (2001) warns that the economics of both community costs and benefits from wildlife should be treated with caution. The community may perceive that they are receiving an inequitable amount compared with other stakeholders. Distribution between different stakeholder groups or individuals may also be perceived as inequitable. Shackley (1996:91) raises the issue of communities not receiving their fair share of revenues as a problem with wildlife tourism, and this is supported by Mvula's (2001) findings in Zambia.

Uneven or inequitable distribution of funds can lead to conflict when one community is perceived to benefit over another, and when one group or individuals within the community benefits over others. Adams and Infield (2003:183, 186) discovered that many groups in Africa could legitimately share in the potential large profits from gorilla tourism in parks, including the local community, tourism/conservation business, and the national government. Some of the problems identified with gorilla tourism relate to unstable revenue that does not succeed in meeting the economic expectations of local communities (Box 7.4). In reality, very little park revenue stays in the immediate area and little re-investment is made in the parks or the local people (Butynski and Kalina, 1998:305).

Perceived inequities in the distribution of benefits, not just direct financial benefits but also benefits from opportunities, such as employment, is a further source of conflict identified in ICDPs (Hitchcock, 1997:89). In addition, the growing population of some host communities, such as those interacting with gorilla tourism in Uganda (Lepp, 2002:219), puts additional strain on resources and profit distribution.

Although wildlife tourism brings rewards, its benefits are seldom distributed equitably (Shackley, 1996:91) and 'Whatever the size of revenue streams from wildlife, there are questions of allocation between different interests' (Adams and

Infield, 2003:178). Where wildlife tourism is associated with conservation, for example, competing interests may come from those whose primary concern is to use such revenues to compensate and support the livelihood and development needs of local communities and those who desire to use revenues primarily to meet the planning, administration and management costs of conservation (Adams and Infield, 2003:178).

Conservation efforts can also negatively affect local peoples' basic human rights (Hitchcock, 1997:81; Johnston, 2003). In Africa, for example, people have been 'killed by government officials in the pursuit of biodiversity preservation' (Hitchcock, 1997:83). Since the time of colonial institutions in Africa, 'coercive conservation' (p83) has taken place and in some instances people perceived to be obstacles, such as indigenous host communities, have been beaten and tortured (p87). This highlights the importance of taking each national context into account when developing any wildlife tourism venture because it can affect sustainability (Lepp, 2002:219).

These costs can lead to host resentment towards tourists, other stakeholders, and wildlife. Certainly the removal of cattle and herders from designated conservation areas can put hosts off-side, though in some places there have been attempts to counter this through environmental education programs (Butynski and Kalina, 1998:304). If hosts are sufficiently discontented, they may retaliate against the wildlife and could become a direct threat not only to the sustainability of wildlife tourism but also to any associated conservation attempts. For example, a study by the Kenya Wildlife Service showed that the vast majority of landowners and users in pastoral Kenya would like to see protected areas opened for development and all wildlife eradicated (KWS, 1995c, cited in Norton-Griffiths, 1998:285) because they do not perceive any benefits from wildlife conservation.

'Host communities, particularly those in the developing world, are increasingly counting the costs of development that has failed to put their rights and interests on a par with those of their visitors' (Mvula, 2001:393). When communities are removed from the land on which they have traditionally subsisted for many generations it would seem their rights and interests are also not considered on a par with the tourist attraction – the wildlife. Scheyvens (2002:54) too has noticed that 'many efforts at implementing environmentally sensitive tourism have focussed on the conservation of resources ..., neglecting the livelihood needs of local communities.' While this focus has some merit, as there is clearly a need to protect the tourist-attracting resource, there is also a need for recognition that the host community may be linked with that resource, in varying ways, and a need to protect, or at least provide for, the hosts.

An analysis of the costs and benefits of wildlife tourism, to both hosts and wildlife, might conclude by seeing it as a necessary evil. Without the incentives and revenue from tourism, the mountain gorilla population in Africa (McNeilage, 1996, Box 7.4) and the Little Penguin population on Australia's Phillip Island (Box 7.3) are unlikely to have survived. For the conservation of the species it may seem necessary to promote wildlife tourism as a form of development, but whether this is the best course of action for the hosts needs further consideration.

The way forward for hosts and wildlife tourism

Many of the problems associated with wildlife tourism are the same as those applying to other forms of tourism, thus parallels exist in many of the possible solutions. However, bearing in mind both the intra and inter-heterogeneity of communities, it is

important to note from the outset that 'there is no simple overall solution as each community is governed by a different set of constraints' (Shackley, 1996:88). So, too, appropriate solutions may differ between more-developed and less-developed countries.

Solutions to some host-community problems have been attempted through ICDPs and CBNRM. These have been used as solutions to the desire by some for conservation and assume 'that people will be more likely to conserve resources if they are able to gain direct benefits from them' (Hitchcock, 1997:81). Ideally, such benefits lead to positive attitudes toward conservation (Mvula, 2001:397); however the results of ICDPs have been mixed. Whilst providing income and employment for some, they have also reduced access to land and resources, increased wildlife depletion, increased impoverishment, and exacerbated internal conflict (e.g. Hitchcock, 1997:86-7). If ICDPs and CBNRM programs truly are community based then they should fit with neopopularist approaches that promote the centrality of host communities in tourism planning and management (Scheyvens, 2002:53). Ideally community-based organisations aim to give hosts the opportunity to contribute to policy formation and such a ' … bottom-up method with projects initiated at a local level is always more successful, … and generally results in more widely disseminated benefits' (Shackley, 1996:83).

As discussed, the value placed on the tourist-attracting wildlife might differ between hosts and other stakeholders. Without an appreciation of the economic value of wildlife as a tourist attraction, the host community is less likely to support its protection through the development of tourism. Therefore, financial issues specific to wildlife tourism need to be solved to the satisfaction of the hosts. However, it is not easy to ensure that this takes place, especially in contexts where the host community occupies a position of less power than other stakeholders. At the very least, those removed from within park boundaries and affected park neighbours need to be adequately and equitably compensated for the direct and indirect costs (such as crop raiding and loss of access to resources) of wildlife tourism. Where this has been undertaken, it has met with little success and clearly new approaches are needed.

There is general agreement in the tourism literature that hosts should have a full participatory role in every stage of development of a tourism proposal (Burns and Sofield, 2001; Scheyvens, 2002; Sofield, 2003). A challenge for communities, and those agencies and authorities working with them, is how to turn passive involvement into active participation (Ashley and Roe, 1998:24; Mvula, 2001:395). However, this must be reconciled with the knowledge that host participation is not a proven solution to all problems (Bolton, 1997:241). Where participation is embraced, Scheyvens (2002) and Sofield (2003) argue that it needs to go further than active involvement to ensure the community has some control over the outcomes and is empowered by the process. They posit that community empowerment is a crucial element in attaining sustainable tourism, and further research is needed to understand how such empowerment is best achieved. In particular, Sofield (2003) notes a need to better understand host perceptions, values and priorities regarding tourism's place in their community. The adoption of collaborative management structures (as found at Uluru and Kakadu National Parks in Australia) can encourage host, as well as other stakeholder, engagement and foster equitable ways of working together in recognition of the need for cooperation both within and beyond the host community (Scheyvens, 2002:10).

A further strategy worthy of investigation in relation to wildlife tourism is the 'livelihoods approach' which 'calls for attention to be paid to a diversity of livelihood strategies, rather than encouraging communities to embrace tourism at the expense of other subsistence and economic opportunities' (Scheyvens, 2002:51). This may be especially relevant to situations where wildlife tourism has not proven to be completely satisfactory to hosts. Where this strategy is adopted, and thus far it seems more common in more developed countries, it has met with some success. For example, the Phillip Island host community (Box 7.3) is not solely reliant on the income from wildlife tourism for their livelihoods and this may well be a contributing factor to the tourism's sustainability. Such diversification can offer advantages to situations like that of Gorilla tourism in Africa (Box 7.4), to counter the threat from political instability to continuity of income from wildlife tourism, by fostering the existence of alternative subsistence activities. 'Under such a regime a community may identify tourism as just one strategy for development, utilising their natural resources while agriculture, craft production and hunting are concurrently pursued in a sustainable manner' (Scheyvens, 2002:55).

One problem that arises when trying to couple other development with wildlife tourism is that the goals of the alternative strategies (such as hunting) may conflict with the goals of wildlife tourism (such as conservation) and the expectations of tourists. That is, tourists are unlikely to be happy if hosts hunt the wildlife they have come to view, especially if the wildlife is in a protected area. Also, when the tourism is embedded in ecocentric Western notions of conservation then even hunting away from the tourist gaze is unlikely to be supported by the industry.

Although some alternate strategies might be incompatible with some forms of wildlife tourism, depending on the context, it may be possible to positively combine other forms of tourism with wildlife tourism and, through this focus on what the hosts want, to present the combination for tourist consumption. Mvula (2001), for example, notes the possibility of combining cultural tourism with wildlife tourism in Zambia and this has been put into practice elsewhere; for example, the Harry Nanya Tours in Australia where camel riding and indigenous cultural interpretation is a focus but wildlife spotting is included (Muloin et al., 2001:13).

Before any of these proposed solutions becomes widespread in practice there is need for a fundamental shift in the power relations (Fennell and Dowling, 2003:333), between tourism stakeholders, that underlie many of the problems, especially those related to inequity in distribution of benefits. Host communities, especially those in less-developed countries, are the stakeholders most likely to be marginalised in tourism's power structure and they must be included as equal partners in the development process (ibid). The managers and policy makers in the tourism system need to be willing to focus less on traditional policy and more on finding ways to adopt innovative and integrated policy schemes (ibid:340). Such policies need to be flexible in the 'on the ground' context. Norton-Griffiths (1998:285), for example, cites new policy options in Kenya that aim 'to ensure that the benefits of wildlife to landowners create incentives to invest in wildlife conservation so that landowners (and users) will become partners in conservation … rather than opponents.'

As with all development projects, it is not adequate in wildlife tourism to simply impose traditional models devised elsewhere on the assumption that they will be equally applicable in all contexts (Gardner and Lewis, 1996). Because a wildlife tourism venture is successful in one cultural context does not mean it will be

successful in another. Just as not all stakeholders may share the same environmental attitudes and values, so too not all cultures of the world share the same environmental attitudes and values. Assuming conservation of an endangered species to be a universally held goal might be inaccurate. Sofield and Li (2003), for example, highlight a dominant philosophy in China that perceives nature to be imperfect thus giving humans a responsibility to improve it: a belief in direct opposition with the thinking of ecocentric philosophers of the Western world. Imposing values and associated policies cross-culturally on host communities will likely lead to dissatisfaction and resentment, especially if it is done without explanation (education), collaboration (participatory involvement), and adequate compensation. All these need to be designed to fit with the local culture and the goals of the host community. Education needs to be undertaken on the host community's terms, in an appropriate and culturally sensitive fashion. Collaboration needs to occur in ways that are meaningful to all stakeholders, and compensation determined and distributed in a manner that recognises the host value (not just monetary) of the resource. Such an approach is not easy, but it is necessary.

Conclusions

The general tourism and conservation discourses provide important lessons for understanding the position of the host community in wildlife tourism. There is also a need to critically analyse examples for, and from, the complete range of stakeholder perspectives. The literature and examples drawn upon in this chapter illustrate the important two-way relationship between hosts and wildlife tourism. Hosts have much to offer wildlife tourism and wildlife tourism has much to offer hosts. Through extensive traditional, and in-depth local, knowledge host communities can enhance the wildlife experience for tourists and positively contribute to species and ecosystem conservation; thus increasing the possibility of wildlife tourism being sustainable. Effective host participation in planning and management can build support for wildlife tourism developments, create new partnerships, help resolve conflicts between stakeholders, and provide an additional source of knowledge and labour. Revenue, via compensation and employment, from wildlife tourism can increase host communities' standards of living. However, revenue form and distribution needs to be carefully considered through a process that includes the active participation of hosts and this needs to be balanced against the substantial costs in money and time required for comprehensive programs of stakeholder participation.

Hosts must not be overlooked. Their crucial role in sustainability must be acknowledged and incorporated into wildlife tourism planning and management. The barriers identified, which may be peculiar to each cultural context, need to be overcome in ways that ensure the flow of maximum benefits and minimum costs. A key challenge is to find opportunities for host involvement, if they want to be involved, and appropriate paths for that involvement that move beyond menial, low-paid, servitude roles in the tourism industry to ensure greater financial and power related benefits. Although increased participation is a commonly argued solution to problems arising for host communities and development projects, this will only be effective if willingly adopted by all stakeholders. Even if hosts chose to participate and other stakeholders willingly incorporate them, it should still be recognised that even strongly-supported participation is not a panacea. Where hosts experience dependency and disempowerment a more integrated community-based 'livelihoods

approach', promoting a diversity of development strategies for the community, may be successfully adopted. Most crucial is the recognition of host community world-views of nature and conservation, which may differ from those of other stakeholders, such as tourists and outside operators. These views, and the values they encompass, hold the key to host acceptance of wildlife tourism and thus its long-term sustainability.

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Chapter 8

Economics of Wildlife Tourism

Clem Tisdell and Clevo Wilson

Introduction

Economics has a variety of applications to wildlife tourism that are dealt with in this chapter. These include: (1) estimates of the impact of expenditures by wildlife tourists on incomes and employment (this is a branch of economic impact analysis); (2) consideration of the economic value of wildlife for satisfying human wants for tourism and other purposes, and the implications of these values for the optimal economic management of resources, including wildlife (this is a branch of welfare economics); (3) use of economic policy instruments to achieve improved outcomes from wildlife tourism.

Economics can also provide a basis for various predictions or forecasts about the demand for wildlife tourism, and can be used to assess environmental change involving such tourism (see for example, Tisdell, 2001, 2002) and to examine sustainability issues pertinent to wildlife management.

Sustainability issues involving wildlife conservation, tourism and economics are complex (see Isaacs, 2000; Gowdy, 2000 and other articles in *Wildlife Society Bulletin,* (2000) Vol. 28, No. 1; Tisdell, 1987, 1998; all reprinted in Tisdell, 2001; Tisdell and Wen, 1997a, b; Tisdell, 2002, Chs. 5 and 6; Tisdell, 1999c, 1999b). There is no doubt that economic systems can be a threat to economically sustainable development, and can imperil the conservation of biodiversity. Sometimes, the commercial development of wildlife tourism contributes to these unfavourable results and provokes calls for regulation of tourism.

Economic impact of wildlife tourism on income and employment

Wildlife viewing tourism is an important segment of tourism (see Ch. 2) and has grown rapidly in many countries in recent decades (see Field, 2001; Wilkie and Carpenter, 1999) and is becoming a major industry (see The US Fish and Wildlife Service, 2001). For many tourists, a significant reason for visiting a country/region or extending their stay is the presence of wildlife. South Africa is a case in point.

The demand for wildlife tourism comes from a wide group of visitors, both domestic and foreign, as discussed in detail in Chapter 9, as well as specialists and generalists (see Wilson and Tisdell, 2001). Similarly the amount of money generated from such tourism varies according to species (Wilson and Tisdell, 2003), foreigners and locals (Tisdell and Wilson, forthcoming, b) and on average, specialists such as birdwatchers, spend more money than generalists (Sekercioglu, 2002). Furthermore, a large percentage of visitors would not visit an area if it were not for the presence of wildlife and tourists often spend extra days in an area because of the presence of wildlife (Wilson and Tisdell, 2003; Tisdell and Wilson, 2002a).

The economic importance of wildlife tourism has been measured in different ways. The appropriate method depends on the purpose of the exercise. Some methods are dubious and give conflicting results. This is partly because estimating *all* the costs associated with wildlife tourism (e.g. travelling, accommodation and food) is difficult. Furthermore, visitors often want to see a multitude of attractions, including wildlife.

Such multi-purpose journeys usually involve several sites. This creates a major problem in using the travel cost method for estimating the value of sites, as discussed below. However, despite such difficulties, many studies have shown that the expenditures incurred as a result of wildlife tourism are large (see The US Fish and Wildlife Service, 2001; Benson, 2001; Upeneja et al., 2001; Zawacki et al., 2000; The International Ecotourism Society, 2000). Some studies show that the primary employment generated from wildlife tourism related expenditure is large and after allowing for the multiplier effect, the total employment impacts are even larger (see World Tourism Organisation, 1999; Howarth Tourism and Leisure Consulting, 1981). Although large estimates of income and employment generated from wildlife tourism and its multipliers are attractive and useful for a country, especially for political support, these estimates can be misinterpreted. For example, despite the large national estimates indicated in the mentioned literature, the benefits to the local area where the wildlife viewing takes place are sometimes small because most of the expenditures take place outside the local area. This has implications for the conservation of wildlife that is involved in tourism. Another important issue that should be borne in mind is that these economic impacts only arise from market expenditures and they do not represent total economic values as explained below.

Because of the problems and issues involved in estimating *all* the expenditures on wildlife tourism, it is often more realistic and relevant to estimate the economic benefits to the local area or region arising from wildlife tourism, although this approach is also not without problems. Economic impact analyses can be used for this purpose.

Box 8.1 shows regional tourist expenditures associated with sea turtle and whale watching in Queensland, Australia. It can be seen from Box 8.1, that the local income and employment created by the initial wildlife tourism expenditures can be large.

Box 8.1: Regional economic impacts of wildlife tourism – evidence from Australia

Many tourists, both local and foreign, watch sea turtles and whales in Australia as in some other parts of the world during the respective seasons. During the 1999/2000 sea turtle season, 23,500 visitors came to Mon Repos, Queensland and 62,670 persons visited Hervey Bay to watch whales in 2000. A study conducted to determine the local economic impact found that the average expenditure per respondent per day on accommodation, food, travel, souvenirs purchased and recreational activities in the region (Bundaberg and Mon Repos) within a 60 km radius was Aus $35.45 per day. Assuming that this is the average expenditure of the 23,500 sea turtle viewers, the total direct expenditure in the region from sea turtle viewing is approximately Aus $833,075. Since the average number of days spent by these visitors is 3.21, the amount of expenditure in the region for the sea turtle season was approximately Aus $2.68 million for the 1999/2000 season. In the case of whales, assuming that the average expenditure of 62,670 whale watchers in the Hervey Bay region for 2000 was Aus $125.97 per day, then the total direct expenditure is approximately Aus $7,894,539. Since the average number of days spent by whale watchers is 3.76, the expenditure in the region during the season is approximately Aus $30 million.

Sources: Tisdell and Wilson (2002a); Wilson and Tisdell (2003)

It is commonly thought that the economic value of a commodity, such as wildlife tourism, can be appropriately measured by expenditure on it. While this can indicate primary impacts of this expenditure in generating income and employment, such impact analysis does not represent economic value or worth, as ably explained by Bishop (1987). Furthermore, in the absence of this particular economic exchange, money may be spent on something else that would also generate income and

employment. For example, suppose that annual expenditure on wildlife tourism in a region is estimated to be $100m annually. This will support income and employment in the locality. Now imagine that the wildlife disappears and with it wildlife tourism in the region. In such a case, the land previously utilised by wildlife may be converted to farms, or alternative economic uses. Then $100m annual expenditure on wildlife tourism in the region might be diverted to purchase those alternative products or spent in other regions. For instance, $70 million might be spent in the local region purchasing these products. Therefore, because of these issues it is important to take into account the net economic impact of wildlife tourism for a country/region.

Because wildlife provides monetary benefits from tourism and creates employment, governments or states have an incentive to conserve wildlife even though all the benefits cannot be estimated or may not remain in the areas or regions where wildlife is viewed. Monetary benefits from wildlife usually provide an important incentive for government intervention in conserving wildlife because the overall benefits to a country from wildlife tourism are positive (despite some leakages abroad), although all of these benefits may not accrue to local areas or communities where wildlife tourism occurs. In the absence of wildlife for viewing or wildlife tourism, some groups of tourists may by-pass the country or spend fewer days in a region or country. This is more likely to be the case with specialists such as birdwatchers. For example, *Birding Tours Worldwide* (2003) advertises many countries for their birdlife. In the absence of this advertised birdlife the countries concerned would have fewer visiting wildlife specialists.

Total economic value and wildlife tourism

Economics concentrates on valuation to provide guidance on how to deal with the basic economic problem, the problem of reducing economic scarcity. Because individuals as a whole want more from available (limited) resources than these resources are able to provide, comparative economic scarcity exists. The economic problem then arises of how to manage, administer or allocate these scarce resources, so as to satisfy human wants to the greatest extent possible. The management of wildlife to satisfy human desires for tourism constitutes a resource use.

Welfare economics tries to express all the economic values that humans assign to resources in terms of money. These economic values are derived solely for the purpose of addressing the basic resource allocation problem, as envisaged by economists. This is why economists calculate economic values and as Bishop (1987) states non-economists should give greater attention as to why this is done. Most frequently these monetary values are based on the willingness of individuals to pay for the use of a resource and its conservation, for example, a particular species of wildlife.

A major issue for economics is how to determine appropriate monetary measures of value in order to address the basic economic choice problem effectively. A related issue is the extent to which economic and social systems (of which the market system is an example) ensure a socially efficient or optimal allocation of resources from the point of view of satisfying human wants. It is found that actual economic, social and political systems often fail to satisfy human wants efficiently. This is reflected in the fact that if available resources were better managed, some people could be made better off without anyone being made worse off. In such cases, economists claim that a social improvement is possible. Whether or not a social economic improvement is possible is usually decided by economists on the basis of the Kaldor-Hicks test,

sometimes called the potential Pareto improvement test. According to this test, a change is a social improvement if those who gain from it could compensate the losers and remain better off than before the change.

Market and other systems sometimes fail to satisfy human wants to the extent possible because they do not take full account of total economic value. They may, for example, fail to conserve wildlife resources to the extent desirable for tourism and other purposes, because the relevant monetary payment in the market system for these resources is much less than their total economic value, as measured, for example, by the maximum amount that individuals would be prepared to pay for these resources. Market systems fail to take into account unmarketed values because owners of resources providing unmarketed or unmarketable economic values gain no financial benefit by taking these values into account in their decision-making. This may call for government intervention in the system to take account of unmarketed economic values, for example, to protect wildlife by providing national parks.

The total economic value of a resource has been defined as being equal to its *total economic use value plus its total economic non-use value* (Pearce et al., 1994). Note that these values are all measured in money terms, for example, dollars.

Non-use economic values usually involve relatively intangible attributes of resources. In the case of a wildlife species, non-use value includes the economic pure existence value of the species, its bequest value and arguably its option values. This is because some textbooks in environmental economics also categorise option values under use values (for example, Pearce et al., 1994) because of the possibility of using the resource in the future. Individuals often place an economic value on species they will never use nor see as shown by their willingness to pay for their continuing existence. Some individuals wish to conserve species for future generations and are prepared to pay for this. This represents an economic bequest value. Option value refers to the willingness to pay for keeping open the option of possibly using a species in the future, even if it is not being used now or to accommodate a possible change in its non-use values. For some species, non-use values constitute nearly all their total economic value as illustrated in Box 8.2. For other species, their economic use value constitutes most of their value.

Box 8.2: The relative importance of the non-use economic value of wildlife species - elephants and tree kangaroos

Estimates of the economic value of wildlife species show that for some species non-use economic value accounts for the major part of their total value and that use value, including tourism use value, can constitute a low fraction of this value. For example, Tisdell and Wilson (forthcoming, a) found that non-use value accounted for 80 per cent, or more, of the total economic value of Australian tree kangaroos for more than half of a sample of over 200 respondents in Brisbane, Australia. In this case, those surveyed were asked how much they were prepared to donate as a one-off payment to help conserve Australian tree kangaroos. They were then asked to state what percentage of this payment (an indication of economic valuation) was dependent on their being able to see or use Australian tree kangaroos. The residual was used to indicate non-use economic value. Bandara and Tisdell (2003), used a similar but more detailed approach. They found from a sample of 300 residents in Colombo, Sri Lanka, that the tourism economic value of the Asian wild elephant only accounted for 26 per cent of its economic value and that more than half its economic value could be attributed to its non-use value. Both Asian elephants and tree kangaroos in the wild are used for tourism purposes. Their non-use values help foster political support for their conservation. This in turn assists the sustainability of these species (and other species associated with the same habitat) thereby contributing to the sustainability of associated wildlife tourism.

The economic value derived from wildlife tourism is an economic use value. Tourism use of wildlife may be consumptive, as in the case of recreational fishing or hunting, or it may be non-consumptive, as in the case of whale watching or in the viewing of wildlife generally. Often tourism use of wildlife is not marketed or priced, as in many national parks or protected areas where entry is free, or it is underpriced. This can result in the false conclusion that the wildlife concerned has little or no economic value and in turn, can result in inappropriate social decisions about wildlife conservation.

For example, suppose entry of visitors to a protected area is free, such as in the case of many Australian or New Zealand national parks. Suppose that the most profitable alternative use of the area is for the grazing of beef cattle. This alternative may provide a profit of $1 million per year to graziers, but renders the land unsuitable for wildlife tourism due to loss of wildlife species and habitat change. If, however, the economic value of the area for wildlife tourism exceeds $1 million, it is socially optimal, in terms of satisfying wants, to protect the land and use it for wildlife tourism rather than use it for cattle grazing. The decision about which is the better resource-use alternative in economic terms requires careful measurements to be made of the economic value of tourist use. Even if tourist use value is less than $1 million, the addition of non-use economic values of the protected area may imply that the best economic use of the land is one involving nature-conservation and its use for tourism. This, for example, would be so if this alternative results in a non-use value of $400,000 per year for the area and a use value for tourism of $800,000 per year.

Note also that while the standard economic theory of total economic value assumes that the components of total economic value are additive, there may be interaction between the components and consequently the additivity assumption is then not satisfied. For example, the non-use economic values of a wildlife species may be increased by watching it and by favourable ecotouristic experiences (Tisdell and Wilson, 2002a) as illustrated in Box 8.3, and as detailed in Tisdell and Wilson (forthcoming c). Furthermore, not everyone is convinced about the appropriateness of the values and assumptions underlying the total economic value concept (see for example, Erickson, 2000 and Tisdell and Wen, 1997a). Despite such limitations, the concept of total economic value marks a significant step forward compared to valuation techniques that only consider use values.

Box 8.3: The impact of wildlife tourism on economic values - ecotourism and turtles

Economic values placed on wildlife for tourism and other purposes are not static. For example, it has been found that the ecotourist's experiences with wildlife can increase their economic support for the conservation of the species concerned. The perceptions of visitors of both economic use values and non-use values of a wildlife species can rise as a result of contact with the species and the educative experience involved. For example, Tisdell and Wilson (forthcoming, c) and Tisdell and Wilson (2002a, 2001) found that on average, visitors to Mon Repos Turtle Rookery, substantially increased their stated willingness to pay for the conservation of sea turtles within Australia after their experience. Over 40 per cent of respondents in a sample of 519 said that as a result of their visit to this rookery, they would like to contribute more money to the conservation of sea turtles. Only one per cent of the sample said they would contribute less. The majority of visitors (98%) were also convinced following their visit that more action should be taken to minimise threats to sea turtles.

Measuring the economic value of wildlife tourism as a form of land or resource use

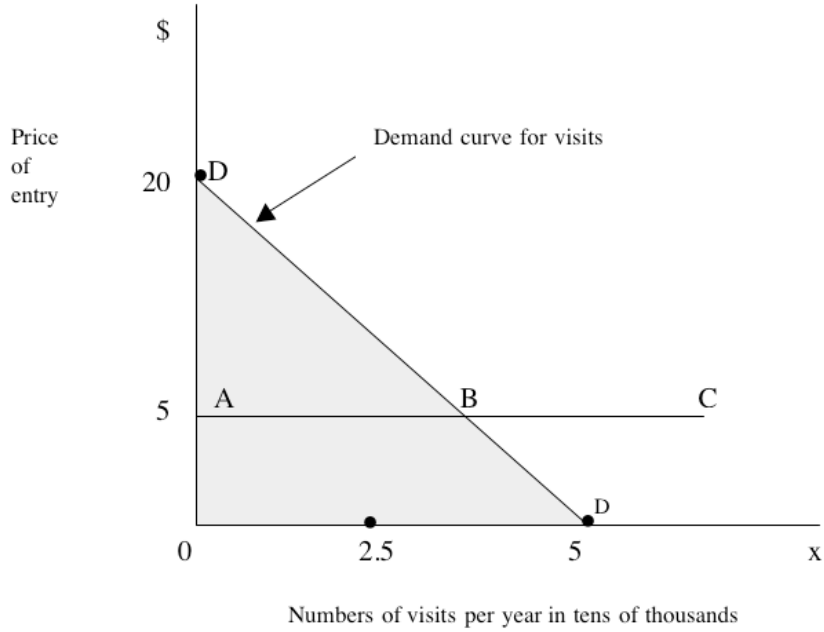
Sometimes just one species of wildlife is the sole, or virtually the sole feature, attracting visitors to a particular area. On other occasions, a combination of different wildlife species and other features attracts visitors to a site. It can then be difficult or impossible to disentangle the separate economic values of each component for tourism, because the tourism economic value of the combination exceeds the sum of the values of its individual components. In situations where there is only one species involved, the travel cost method may be used or a variant of the contingent valuation method employed to determine the economic value of the species for tourism. Similarly, the contingent valuation method can be used in the second case for valuing the overall environmental attraction.

The travel cost method (discussed, for example, in Hanley and Spash, 1993, Ch. 5) is the most popular and the longest established method for estimating the demand for visits and to value sites used for outdoor recreation (Hotelling, 1947; Clawson, 1959, Knetsch, 1963; Clawson and Knetsch, 1966). Described as a revealed preference method, it uses the cost of travel as a surrogate for the price of using a tourist site. Those who travel further usually pay more to visit a site. Other things equal, we would expect those individuals living further away from a wildlife tourist or recreational site to visit it less frequently than those closer by. It is possible empirically to estimate the relative frequency of visits at a site from zones around the site as a function of the cost of travelling to the site. This relationship is called the trip generation function.

This function can then be used to estimate the aggregate demand curve for visits to the site. The demand curve provides a basis for placing an economic value on tourism at the site. If wildlife is the prime attraction, then, as explained by Loomis (2000), the demand curve can provide a basis for measuring the economic value of wildlife tourism at the site. The area under the demand curve represents the maximum willingness of visitors to pay for visits to the site. If entry to the site is free and no on-site costs are associated with visits, the area under the demand curve represents the overall economic value of the site for (wildlife) tourism.

In the case illustrated in Figure 8.1, the line marked, DD represents the demand to visit a wildlife area as a function of the price of a visit. One way of estimating this demand relationship empirically is by the application of the travel cost method, but it is not the only possible method for doing this. The maximum willingness of individuals to pay for visits is equivalent to the area of the shaded triangle in Figure 8.1, namely $500,000 per annum. If visits are free, this is the economic surplus of visitors. It is also the annual economic value of the site for tourism if visits impose zero maintenance costs. If the next most economic use of the land is for agriculture and this has an annual economic value of $200,000 (level of profit), optimal social economic choice would require the site to be allocated to (wildlife) tourism. This is so even though use of the site is free. It should, according to the principles of welfare economics, be free if there are no running (or marginal) costs to cater for visitors, and no crowding problems.

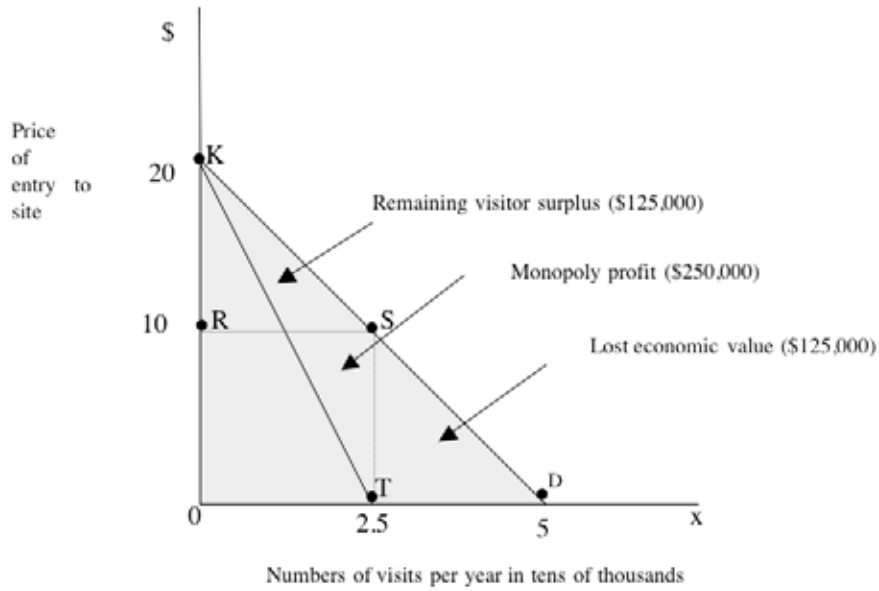
Figure 8.1: The economic value of a protected area for tourism or outdoor recreation as indicated by the economic surplus (the shaded area) obtained by its visitors if entry is free and marginal cost is zero.



According to economic welfare principles, visitors to a site should be charged the marginal cost of catering for their visits because this is the economic opportunity cost of resources used to service visitors. If that is zero, then free entry to the site is socially optimal. On the other hand, if, for example, catering costs are $5 per visit, a fee of $5 per visit is optimal, assuming no collection costs. At point B, the extra value placed on visits by tourists, as indicated by the line DD, just equals the extra cost of catering for an extra visit. The net economic value of the protected area for tourism would then be equivalent to the triangle above line AB.

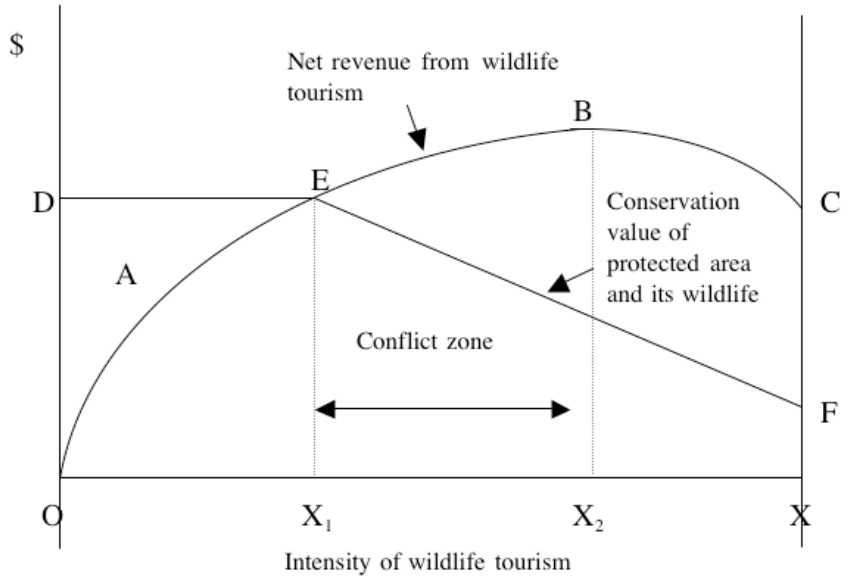
Observe that it is not socially optimal to charge a monopoly price or to maximise total income or revenue at a tourist site. This can be illustrated by Figure 8.2. The monopoly-profit maximising price is $10 per visit, the value for which marginal revenue indicated by the line KT equals zero, and provides an income from the site of $250,000 per annum, equal to the area of rectangle OTSR. It leaves visitors with an economic surplus of $125,000 per year. Hence, with this charge (fee), the overall economic value derived from the site is $375,000 per annum. This is less than its overall economic value when entry is free, namely $500,000 per annum. So monopoly-pricing results in *lost* economic value annually of $125,000, equal to the area of triangle TDS.

Figure 8.2: An example illustrating how maximising income or expenditure on visits to a wildlife site can reduce the social economic value of the site.



The economic principles for determining socially optimal fees for wildlife tourism are complex. But from this example, it can be seen that a larger amount of receipts or income (for the operator) from wildlife tourism does not necessarily represent greater economic value. In the above case, maximum revenue from wildlife tourism actually reduces the economic value obtained from wildlife tourism by $125,000. Furthermore, it should be borne in mind that there can be a conflict between maximising tourist receipts from a natural area and sustaining wildlife and conservation values. This is illustrated in Figure 8.3. In Figure 8.3 let curve OABC represent the net revenue, which a protected area with wildlife can earn from wildlife tourism, and let the curve DEF represent the conservation value of this area and its wildlife, which may be indicated by an index. In this case the protected area could be used for wildlife tourism up to an intensity X_1 without compromising the conservation value of the area and its wildlife. In this case wildlife tourism and conservation are not incompatible. However, any expansion of the wildlife tourism beyond this point to generate extra revenue, say to level X_2 may compromise the conservation value of the area and its wildlife. This is sometimes a serious problem in China (Tisdell, 1999a) and elsewhere and leads to situations where wildlife tourism and conservation are in conflict.

Figure 8.3: Possible conflict between wildlife tourism and conservation of wildlife



Source: Adapted from Wen and Tisdell (2001)

Observe that charging the monopoly price would boost public finances but is indefensible from the point of view of maximising social economic benefits from the available wildlife resources. Again, observe that if all receipts were spent locally, this would boost local incomes and employment to the greatest extent if receipts happened to be maximised. This local 'benefit', however, would be at the expense of national or global satisfaction of economic wants. Thus, social indications obtained from economic impact analysis can conflict with the goal of maximising national or global economic welfare. Nevertheless, politically, impact analysis is often given a lot of weight.

Note that this analysis does not differentiate between domestic and foreign tourists. It basically adopts a global outlook. However, some countries concentrate on the maximisation of national economic benefits and charge higher prices to foreigners than locals to visit their national parks. This may increase their national economic welfare. Developing countries in particular, often believe that such price discrimination is justified on income distribution grounds. However, if all nations adopt such policies, global economic welfare can be reduced by their national selfishness.

For some economic allocative purposes, it is only necessary to know the amount of the economic surplus obtained by visitors to a site and not their demand curve for visits. By using this direct estimate, it is often possible to determine whether the use of a site for wildlife tourism is economically more valuable than alternative uses. In fact, Navrud and Mungatana (1994) use this approach (as illustrated in Box 8.4) to estimate the economic value of flamingos for tourist visits to Lake Nakura in Kenya. This method of estimation of the economic surplus is similar to the contingent valuation method because it relies on statements from respondents about the value or economic benefits to them of a resource. The contingent valuation method, outlined in detail in

Bateman et al. (2002), is classified as a stated preference method. Mostly it has been used to estimate the total economic value of economic resources rather than their tourist economic value, as was done by Navrud and Mungatana (1994). As can be inferred from the discussion in the previous section, the total economic value of wildlife resources at a tourist site will normally exceed their tourist economic value, and can never be less than their tourist economic value.

Box 8.4: Estimates of the economic value of flamingos for tourism

Navrud and Mungatana (1994) have used economic methods to estimate the economic value of flamingos for tourism in Lake Nakaru National Park in Kenya. They used both a type of contingent valuation method (CVM) and a travel cost method to derive estimates of the lake's economic value for tourism. From the results of their CVM-type analysis, they found the visitors' economic surplus to be equal to approximately US$7.5 million annually, with one-third of this surplus being due to the presence of flamingos. The motive for the study was that Lake Nakaru was becoming increasingly polluted from industrial and other developments thereby threatening the survival of its flamingos. Touristic economic value of flamingos (which depend on an unpolluted lake) provided an economic argument for regulating the emission of pollutants into the lake. These authors obtain a much higher value for the economic value of Lake Nakaru National Park for tourism using the travel cost method rather than from their version of CVM. This is most likely because travel costs were incurred by visitors (especially international ones) to visit multiple places. This would have limited the applicability of the travel cost method and inflated the estimates of the economic value of Lake Nakaru National Park to visitors.

New economic techniques for estimating the economic value of wildlife continue to be developed. Some of the new techniques provide estimates of the economic value of different attributes or characteristics of wildlife for tourism or recreation. Such methods include the hedonic travel cost method (Brown and Mendelsohn, 1984; Ward and Beal, 2000) and various choice modelling techniques (Hanley et al., 2001; Bennett and Blamey, 2001). Boxall et al. (1996) have, for example, applied choice modelling to suggest policies to increase the economic value obtained from recreational moose hunting in Canada. However, as yet, choice modelling techniques are far from perfect for economic valuation.

Techniques of economic valuation have been developed primarily as an aid for making improved economic choices about resource use. It is only by understanding the basic economic problem and the purpose of economic valuation that one can appreciate the purpose of the economic techniques developed for valuing wildlife and other natural resources used for tourism or outdoor recreation.

Economic implications of empirical estimates of the importance of wildlife tourism

Chapter 1 provides a useful summary of several quantitative estimates of the importance of wildlife tourism as a part of human activity. In the light of the above discussion, we can now assess the importance of such estimates from an economic perspective and point out their limitations.

Most of the estimates given are for expenditures on wildlife tourism. For example, Hoyt (2000) estimated an expenditure of US$1,049 million on whale watching globally alone and Filion et al. (1994) attributed a minimum of 20 per cent of expenditure on international tourism to wildlife-based tourism. As pointed out in Chapter 1, large expenditures are made annually on wildlife tourism and recreation in

the USA. This indicates that there is substantial demand for wildlife tourism and associated hobbies.

These estimates, furthermore, imply that much income and employment is generated by wildlife tourism. The employment and income directly created by wildlife tourism results at the first stage from initial expenditure on wildlife tourism. In turn, when some of this income is spent by the recipients, this creates further income and employment. Economists say that a multiplier effect is present. Filion et al. (1994) suggests that on average this multiplier for wildlife tourism is approximately 2. There is no doubt that such economic impacts assume political significance and sway politicians. However, as pointed out above, income and employment can also be generated by alternative economic activities to tourism and expenditure on tourism does not represent net economic benefit or net economic value.

Nevertheless, Prasad and Tisdell (1998) found that in Fiji, tourism (some of which is nature based) had a bigger economic impact on the Fijian economy than sugar cane production because the income multiplier of the sugar industry was lower than that of the tourism industry after allowing for import leakages.

Income and employment analysis can be especially useful at a regional level. Given income distribution concerns, governments are often anxious to encourage the development of industries that can promote development and create employment in depressed regions. Regional income and employment multipliers can be utilised to compare the potential of alternative industries to create regional employment and income. Due to economic leakages from the local economy, these multipliers will be much lower than national or global multipliers. Leakages are usually higher in peripheral regions (Hohl and Tisdell, 1995, reprinted in Tisdell, 2001) and small economies than in central regions and large economies.

Nevertheless, the development of wildlife tourism can be a valuable means of promoting economic activity in depressed and remote regions despite the problem of high economic leakages. Wen and Tisdell (2001) concentrating mainly on wildlife tourism in Xishuangbanna prefecture found that growth in ecotourism contributed significantly to the economic development of Yunnan Province, China. In Australia, Hohl and Tisdell (1995, reprinted in Tisdell, 2001) found that nature-based tourism, despite economic leakages, provided significant economic opportunities for the residents of Cape York Peninsula.

The number of persons engaging in wildlife tourism is often used to highlight its importance. Higginbottom (Chapter 1) gives estimates that each year millions engage in wildlife tourism in the United States. Globally the numbers may run to many millions. But these numbers, may not be accurate indicators neither of the economic impact nor of the net economic value of wildlife tourism, as pointed out by Tisdell and Wen (1997b, reprinted in Tisdell, 2001).

For example, few may engage in some types of wildlife tourism or recreation yet the economic value placed on it by participants can be much greater than for activities in which many engage. For example, trophy hunting attracts comparatively few tourists, but per capita expenditure by trophy hunters is very high and their economic impact can also be high. We cannot judge the economic impact or the economic value of different forms of wildlife tourism merely by comparing the numbers of persons participating in these. However, participation figures may interest politicians in gauging the number of stakeholders, even if they do not adequately reflect the intensity of the interest of participants.

Most available monetary estimates of the 'economic worth' of wildlife tourism do not successfully measure its economic value but rather concentrate on costs or expenditure involved in it. Although, if accurately calculated, these dollar sums indicate economic impact, they do not reflect net economic worth (net economic value). The latter concept is relevant if the economic focus is on resource use and one wants to minimise collective economic scarcity. The neglect of the latter concept is evident from the monetary measures given in Chapter 1 to indicate the economic importance of tourism. None of the estimates relate to the net economic value or to the net economic worth of wildlife tourism. However, the example given for flamingos and tourism in Kenya (see Box 8.6) does give estimates of their net economic value for tourism.

Thus, measures of the importance of wildlife tourism need careful scrutiny from an economics viewpoint, and vary in economic relevance according to the policy or purpose to be considered. In particular expenditures or costs incurred in engaging in or catering for wildlife tourism are a poor indicator of the net economic value of wildlife tourism in satisfying economic wants collectively.

Can we generalise about economic features of the demand for wildlife tourism? Some generalities are possible but they have not been neatly summarised in one place. However, on the basis of empirical evidence and analysis, Tisdell (1974, reprinted in Tisdell, 2001, p.285) observed:

> "Such factors as: (1) rising incomes, (2) more education, (3) more available leisure time, (4) improvements in transportation, (5) the falling costs of recreational equipment relative to incomes and (6) economic development generally have accelerated the demand to use natural areas for recreational purposes. At the same time as the demand for natural areas has increased, the supply of these has dwindled because increased amounts of land have been appropriated for agriculture, for industry for mining, to accommodate urban sprawl, to provide housing at holiday resorts and to meet other demands of a high consumption society with a rising population. On the face of it the relative value of saving natural areas for recreational and conservational purposes seems high. Indeed there may be a case for reconverting some developed land to a more natural state."

Sinden (1977) provided Australian evidence in support of the above generalisations, which also apply to wildlife tourism. They are also consistent with the observations of Rankin and Sinden (1971).

With economic development or economic growth we can expect both the comparative net economic value and worth of wildlife for tourism to grow and also the economic impacts of wildlife tourism to increase. Since species extinction is as yet irreversible, this provides a powerful argument (over and above total valuation considerations) to conserve wildlife species and resources to cater for future economic needs, including those of future generations.

Much can also be said about the economics of tourist demand at the level of the individual and in particular localities. However, influences on the demand of individuals for wildlife tourism are covered extensively by Moscardo and Saltzer (Chapter 9), and useful guidelines about demand for regional wildlife resources can be found in McNeely et al. (1992) and in Tisdell (1996).

Economic instruments and wildlife tourism – their purpose and usefulness

The allocation and use of scarce resources, including the conservation of wildlife for tourism, not only needs relevant incentives, but also controls so that available resources are not over utilised. This is applicable for both the public and private provision of wildlife for tourism purposes.

Table 8.1: Classification of economic instruments for managing wildlife tourism

Minimum Flexibility	**Moderate Flexibility**		**Maximum Flexibility**	
Maximum Government Involvement			**Increased Private Initiative**	
Control Oriented	**Market Oriented**		**Litigation Oriented**	
Regulations and standards General examples	Charges, taxes and fees	Market creation	Final demand intervention	Liability Legislation
Relevant agency restricts the amount of operators of wildlife tourism and users (visitors) at a site and restrictions placed on certain areas. Compliance is monitored and sanctions made (fines, cancelling/ suspension of license, jail terms) for non-compliance.	*User charges*: The environmental authority, the National Parks and Wildlife Service or landholders charge fees at wildlife tourism sites. Fees are aimed at creating incentives for providers of wildlife, to reduce tourist numbers or both.	*Tradable permits*: Environmental authority establishes a system of tradable permits in the use of wildlife resources. Trading is permitted at unregulated prices.	*Performance rating*: Environmental authority or National Parks and Wildlife Service requires wildlife tourism operators to provide information on the use of wildlife for their business. Notices, informing visitors about the threats to wildlife and threats from wildlife. Eco-certification may be provided for such operations.	*Strict liability legislation*: The tourist operator or user or both are required by law to pay any damages to those affected or wildlife injured. Damaged parties collect settlements through litigation and court system.
Specific examples of applications: • Licensing of wildlife watching activities • Rationing use • Quotas • Zoning • Land use restrictions • No go areas • Distance restrictions for viewing wildlife	• Various user fees to watch wildlife • User charges and permits • Taxes on hunting equipment/fishing gear use • Subsidies to operators/investors • Non compliance charges	• Property rights attached to wildlife resources • Tradable permits for use of wildlife for tourism/hunting or subsistence hunting	• Ranger/display education • Other interpretive facilities • Black-list wildlife tourism operators • Disclose legislation requiring operators to adhere to specified regulations • Provide warnings about dangerous animals and dangers to wildlife from tourism.	• 'Damages compensation for all parties • Zero Net Impact' requirements • Liability on neglecting • Safety requirements • Insurance requirements for wildlife tourism operators

Source: Adapted from Da Motta et al. (1999, p.181)

Several policy instruments have been used/discussed in the economic literature that can be used to manage wildlife tourism. These policy instruments can be used not only to provide incentives or place controls on providers of wildlife for tourism (operators) but can also be aimed at users of wildlife (tourists). Apart from the use of policy instruments to provide incentives or controls, these instruments may also be aimed at generating revenue, which could be used to develop infrastructure facilities, and for conservation purposes.

Sustainable use of resources is a major current policy objective and Davis et al. (2001) have shown that a wide range of economic policy instruments can be used in managing wildlife tourism to meet the aims and objectives of administrators, which of course change from situation to situation. In other words, one set of economic

instruments that works in a particular situation may not be the best in another situation or place. Outcomes from policy instruments can vary a great deal according to circumstances. Some of the available policy instruments are summarised in Table 8.1 and also discussed in detail in Chapter 11. Probably policy instruments listed under 'charges, taxes and fees' and 'market creation' in Table 8.1 are most widely recognised as involving market or economic instruments, but those under 'regulations and standards' and 'liability legislation' also involve aspects of institutional economics.

The choice of instruments by administrators depends upon many considerations and not just economic efficiency. Criteria that administrators may consider apart from economic efficiency include low information costs, equity, dependability, adaptability, provision of incentives and political acceptability (Turner et al., 1994). Despite the large array of policy instruments available, regulatory instruments are most commonly used (Turner et al., 1994), including for the management of wildlife tourism (Chapter 11). The use of instruments such as regulations and standards may be preferred because of the precautionary principle, especially when outcomes are unknown. It has been argued that regulatory instruments require less information than economic-type instruments, are more dependable (subject to adequate policing) and have a higher degree of political and administrative acceptance (Turner et al., 1994). Nevertheless, regulatory instruments allow minimum flexibility, involve 'maximum' government intervention and are 'control-oriented'. Examples of regulatory instruments apart from 'no go areas', bans, zoning and land-use restrictions are the licensing of operators of wildlife-tourism providers. The latter sometimes falls into the category of economic instruments. For instance, whale-shark tour operators in the Ningaloo Marine Park and commercial tourism operators on the Great Barrier Reef, Australia have to be licensed, pay an annual fee and operate within stipulated guidelines. This limits the number of operators and can prevent the over-use of resources. Licensing involving fees also generates revenue. Another commonly-used economic instrument is the levying of fees and charges on tourists to view wildlife. Tour operators charge a fee, part of which is paid to the managing authority such as in the case of whale shark or the Great Barrier Reef viewing. Fees may also be charged to enter nature reserves/national parks such as in the case of national parks in the US or some Australian national parks such as Kakadu national park in the Northern Territory. Fees are also often charged to enter nature reserves managed by non-governmental organisations, such as the Royal Society for the Protection of Birds (RSPB) in the UK.

Apart from generating revenue, fees can be used to reduce the number of visitors to a site, but their effectiveness in doing this depends on the responsiveness of demand to changes in fees.

There is unutilised scope for greater use of some economic instruments. For example, there has been little use of market-based instruments involving tradable permits. This is the case not only in wildlife tourism, but in other sectors as well. Hanley et al. (1997) point out that lack of market-based instruments is due partly to ignorance on the part of policy-makers, practical problems, institutional problems and opposition from administrators and policy makers. However, market-based instruments based on tradable rights are used in wildlife tourism in a limited way in some countries as shown in Box 8.5. The potential exists for the further use of these instruments in wildlife tourism as suggested, for example, by Davis et al. (2001) and

Davis and Tisdell (1998), for instance, in the trading of licenses of the whale shark and those of the Great Barrier Reef commercial tourist operators.

Box 8.5: Use of market-based instruments in wildlife tourism

Wildlife tourism in Botswana is growing and wildlife and tourism planners are hoping to obtain the maximum benefits from wildlife tourism. One example (Rozemeijer, 2000) involves the use of tradable permits in the use of wildlife. In this instance community-based organisations (CBOs) have been issued with exclusive quota rights in the use of wildlife. The community can decide whether to hunt the quota or not, and how to hunt it. According to this system the species can be divided over the community members for subsistence hunting or the quota can be sold to a private sector partner(s) for tourism. Usually the community sells the commercially valuable species such as elephant, zebra, lion and leopard to the private sector partner(s). These species have no subsistence use for local people. Valuable trophy (male) animals such as buffalo, eland, gemsbok, sable, wildebeest and kudu are sold while females (meat value) and the lesser antelopes such as duiker, impala and springbok are retained for subsistence hunting. Trophy hunting joint venture agreements involving tradable permits generate large sums of money at community level and substantial employment during the odd six months hunting seasons.

In addition, institutional changes can bring economic benefits. An example is the new institutional economics approach associated for instance with Coase (1960). It emphasises the importance of property rights and bargaining between the users and parties affected (Tisdell, 1993). The 'Coase theorem' advocates that 'regardless of who owns the property rights there is an automatic tendency to approach the social optimum via bargaining' (Turner et al., 1994, p.153). Wildlife tourism could make use of this approach or a variant of this approach in settling disputes between wildlife tourism operators and land owners or wildlife tourism activities and individuals affected by noise, crowding, pollution and so on.

Yet many wildlife tourism activities operate without being subject to policy instruments. One example is the 'jumping crocodile' cruises conducted on the Adelaide River in the Northern Territory, Australia. Entry and exit for operators are not regulated and there is no tenure in the use of the river for crocodile watching tours. This could create disincentives for investing in these tourism businesses.

Lack of incentives/controls can retard the growth of a sustainable wildlife tourism industry. Furthermore a lack of policy instruments can lead to forms of wildlife tourism which are dangerous. For example in the south of Sri Lanka visitors are taken out in unsuitable (leaking) catamarans to watch herds of wild elephants, sometimes getting closer than is safe. Not only are such forms of tourism dangerous, but they also have negative consequences for wildlife tourism as a whole. As was discussed, economic policy instruments could be used to achieve better outcomes for sustainable wildlife tourism while also meeting some of the other criteria mentioned above.

Conclusions

Wildlife has economic use and non-use values and the sum of these two components make up the total economic values. Use values of wildlife may or may not be priced or marketed. Wildlife tourism creates market use values for some species but not others. The mere absence of market values arising from wildlife tourism for consumption does not mean that such species do not have economic values. These other values of wildlife include indirect use values such as the ecological values they perform in the environment and the non-use economic values they have for humans. Sometimes the non-market values of species, exceed their market economic values. Therefore, it is

imperative that non-market economic values of wildlife are considered in the decision making process when land is allocated for commercial use.

Tisdell and Wilson (2002b), suggest that there is a strong correlation between numbers of wildlife tourists and the frequency of sightings of wildlife. If the frequency of sightings is low or sightings cannot be guaranteed, then the number of wildlife tourism visitors is likely to fall. Hence, demand for wildlife tourism can require the maintenance of sizeable populations of wildlife, and this can result in positive outcomes from the viewpoint of conservation. Therefore, wildlife tourism and conservation outcomes need not be incompatible. However, there are instances where this is in conflict as shown in Figure 8.3.

Various policy instruments, including economic ones, can be used to bring about sustainable outcomes, for wildlife tourism as well as for conservation. If these policy instruments are well used, then a social economic improvement is possible. Economics, therefore, could play a major role in ensuring positive outcomes for wildlife tourism as well as for conservation.

There are many important economic issues in wildlife tourism that need to be addressed in economic future research. Some of these include:

1. How much money wildlife tourism generates and how much of this should be used for conservation. Furthermore, it is important to examine the economic benefits to property owners from wildlife tourism;
2. There is a need to consider not only the economic use values from wildlife tourism but also to consider non-use values arising from it;
3. The role market-based instruments can play in wildlife tourism and the conservation of wildlife needs more attention. At present, the use of such instruments for wildlife tourism purposes is limited;
4. The welfare effects of charging entry fees to publicly managed national parks and wildlife tourism sites need further consideration. Conservation implications and provision of infrastructure from entry fees should also be examined; and
5. The reasons for the increasing degradation of wildlife resources despite the large sums of money generated from wildlife tourism as shown in Chapter 1 need to be understood.

The issues discussed in this chapter have important implications for planning, design and management of wildlife tourism for various stakeholders. Wildlife is a valuable resource and has tourism and other economic values, but needs to be exploited with conservation in mind. These objectives are inseparable. Furthermore, the potential for developing new ventures in wildlife tourism exists but business aspects have to be taken into account (see Chapter 10). Because of the various economic values of wildlife, commercial developers of land should weigh all options before deciding on the appropriate use of land. It may well be that wildlife tourism can be more profitable than producing agricultural commodities, especially in the long-term. It is also important for conservation managers and wildlife tourism operators to consider the non-use values of wildlife which in some species, as was shown, exceed the use values. Furthermore, wildlife tourism can influence the non-use values individuals place on species. All this could increase the economic value of wildlife tourism.

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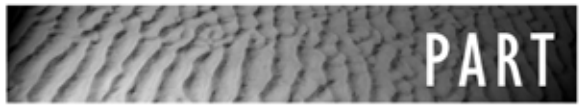


PART THREE

managing and planning wildlife tourism

Chapter 9

Understanding Wildlife Tourism Markets

Gianna Moscardo and Rebecca Saltzer

Introduction

Understanding the nature of visitors is an important but little researched element of wildlife tourism. While there are many references to the size and growth of this market in the existing literature, very little is known about the actual demand for non-consumptive wildlife tourism and what characterises tourists who desire wildlife encounters during their holidays. This chapter begins by examining the role of market research in the planning, design and management of sustainable wildlife tourism. It then looks at what is known about the demand for wildlife tourism experiences before examining the factors that influence visitors' satisfaction and responses to management actions.

According to Hall and McArthur (1993) in the field of protected area management, which includes government agencies responsible for wildlife management, marketing is often seen as a negative term because it is associated with commercial interests and sales. Marketing is, however, about:

- Determining who the customers or stakeholders are;
- What their needs are;
- What expectations and motivations they have;
- What they currently do; and
- How they can be influenced or persuaded to act in ways that match the goals of the setting managers (Morrison, 1996).

Sustainable wildlife tourism requires an understanding of visitors so that programs can be designed to influence visitor behaviour and to support the enhancement of the quality of the experience for visitors thus supporting the financial viability of wildlife tourism operations.

Definitions of key terms

For this chapter the term 'markets for wildlife tourism' or simply 'markets' can be taken to refer to visitors. More specifically, the term 'visitor' will be used throughout this chapter to refer to the people who seek wildlife tourism experiences. Table 9.1 provides the standard World Tourism Organisation definitions of the related terms of visitor, tourist, traveller and excursionist. This chapter will use the term visitor as it includes both tourists and regional residents engaging in recreation, as this is the most inclusive term that covers most, if not all, of the people who participate in wildlife tourism. Finally, this chapter is focussed solely on non-consumptive wildlife tourism experiences and thus does not consider activities such as recreational fishing and hunting (see Chapter 4 for some information on these markets).

Table 9.1: Definitions of visitors, tourists and excursionists

Tourism – the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business, and other purposes. **Traveller** – any person on a trip between two or more locations. **Visitor** – any person travelling to a place other than of his/her usual environment for less than 12 consecutive months and whose main purpose of travel is not to work for pay in the place visited. **Tourist** – (overnight visitor) visitor staying at least one night in a collective or private accommodation in the place visited. **Excursionist** – (same day visitor) a visitor who does not spend the night in a collective or private accommodation in the place visited. In popular usage the label tourist is usually reserved for visitors who are some distance from their home and they are distinguished from people who live in the area. Thus people who are visiting natural environments close to their normal residence are usually seen as **recreationists** rather than tourists, even if they are staying overnight.

Source: McIntyre1993

Why study wildlife tourism markets?

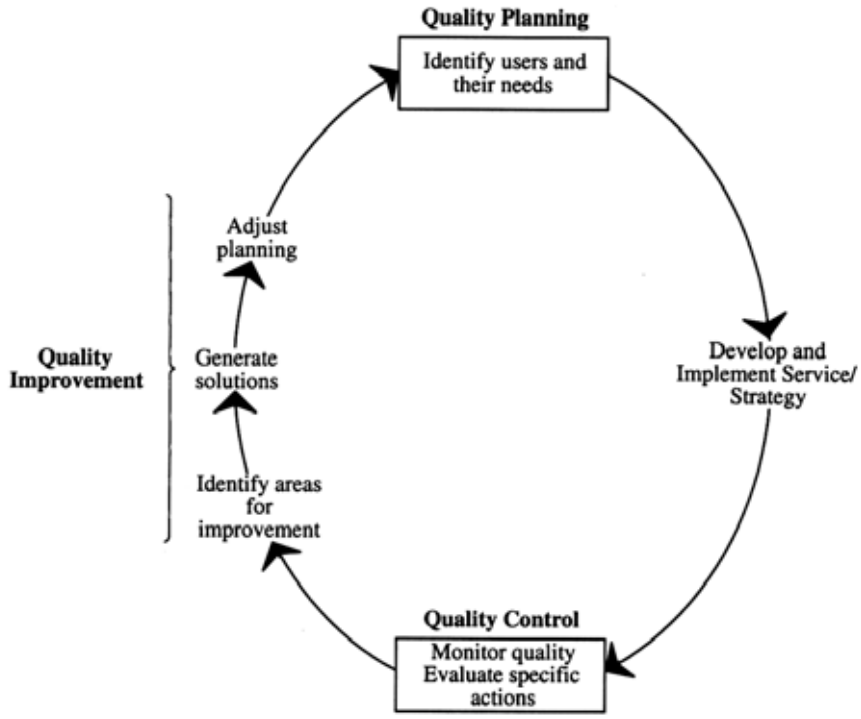
There is a number of different types of provider of wildlife tourism experiences including public, nature and wildlife conservation agencies, other government agencies, non-profit organisations and private tour companies and/or attraction operators. All these different providers have the goal of attracting appropriate visitors and providing quality experiences. For the private companies this is primarily a financial imperative. For the public agencies it can be driven by financial issues, such as the need to raise revenue through visitor fees, and also by the goals set out in their public service charter, which often include the provision of quality recreational and nature-based experiences and educational opportunities (Manfredo et al., 2002). This goal of providing quality visitor experiences is, however, balanced against the goals of public agencies to minimise or eliminate the negative impacts of wildlife tourism on the wildlife and their environments. Thus there are at least three main reasons for studying wildlife tourism markets. The first is to guide the planning of infrastructure and services. The second is to determine the nature of the visitor markets and the factors that contribute to satisfaction with wildlife tourism opportunities so as to provide quality experiences. The third is to understand visitor behaviour and how it can be influenced so as to effectively manage negative impacts of wildlife tourism and encourage positive outcomes such as greater conservation awareness and support.

Understanding quality in wildlife tourism experiences

Manfredo (2002) argues that a major principle for public-sector wildlife conservation managers is ‘to provide a range of quality recreation opportunities that meet the diverse demands of the public’ (p. 14). Quality is a theme that can be found running through much of the tourism and general management literature. Omachonu and Ross define total quality management (TQM) as ‘the integration of all functions and processes within an organization in order to achieve continuous improvement of the quality of goods and services’ (1994, p. 3). Three basic principles or features of TQM can be identified and are illustrated in Figure 9.1. The first is that quality is defined as ‘fitness for use’ as perceived by the users of the product or service. In other words quality can be measured by how well a service or product meets the needs and expectations of the users. Thus users are central to the process of management and an important aspect of management practice is having an understanding of the variety of

users for a particular product or service. The second basic principle is that TQM depends upon effective design and strategic planning (Saylor, 1992; Juran & Gryna 1993; Omachonu & Ross 1994). The third principle is the importance of measurement including both evaluation and ongoing monitoring of performance.

Figure 9.1: Processes and Components of TQM



Understanding how to manage visitors in wildlife tourism settings

Central to all management tools is the need to influence human behaviour and thought in some way. Yet despite this importance, research into human uses and perceptions of natural areas is only recently and often reluctantly being used in natural resource management decisions and planning. Cordell and colleagues (1999) suggested that there are four sets of features associated with human use of natural environments.

- **Interactions** — the activities that humans engage in that have direct and /or indirect impacts on the natural systems. In the case of wildlife tourism these are the actions that visitors take that have impacts on the wildlife and/or the environment in which they are viewed.
- **Demands** — the forces that generate the activities described above. An example of this feature of human use can be found in the issue of fish feeding on coral reef day trips. If evidence indicated that feeding fish to attract them to moorings or visited areas had detrimental effects on the fish, then an understanding of the forces that encourage this activity would be necessary. If the demand for the activity came from visitors who had no other way to view

fish then a solution might involve the development of alternative fish viewing opportunities.

- **Values** — defined as 'significance, meaning, utility or priority attached by individuals or cultures to material or non material matters that form the basis of human thoughts, behaviours and cultures' (Cordell et al., 1999, p.6). In the case of wildlife tourism, an understanding of the values that visitors attach to seeing wildlife is important in influencing conservation efforts and in setting prices and fees for wildlife viewing opportunities.
- **Perceptions** — what people believe or know. Perceptions are based in part on experience but also on culture, education and communication and in turn influence attitudes and behaviour. Understanding human perceptions can be important to the management of wildlife tourism in a number of ways. For example, interpretive programs designed to change attitudes towards less popular wildlife, or to discourage wildlife feeding, need to build upon what people already know about these phenomena.

Put more simply there is a number of different ways that humans can interact with natural environments. In order to manage those interactions it is important to understand the nature and extent of the interactions and the forces that drive and shape them. These forces include the values and perceptions of individual users and interactions within their social networks, groups and communities. When combined with a TQM approach it becomes clear that successful and sustainable management of wildlife tourist experiences needs to be guided by the following information on visitors:

- Level of demand for wildlife experiences
- Characteristics of desired wildlife experiences
- Characteristics of visitors that may influence behaviour and satisfaction
- Visitor satisfaction and /or perceived service quality
- Visitor responses to management actions.

Demand for wildlife tourism experiences

Understanding the level of visitor demand for wildlife tourism experiences is important for two main reasons. Firstly, private sector tourism managers use estimates of demand for particular types or aspects of tourist activities to guide the development of services and facilities. Secondly, managers of the protected areas where wildlife are usually found use estimates of demand to develop plans which may include the development of infrastructure and decisions about permitted activities and levels of use. For both these reasons it is important that estimates of demand be reasonably accurate.

If the available figures overestimate demand then managers may develop too many or inappropriate products. The resulting oversupply can result in severe competition between operators, which in turn can increase pressure on operators to find a competitive edge. If an operator responds to this competitive pressure by engaging in less desirable practices such as going closer to the wildlife or feeding wildlife to encourage their presence, then the inaccurate demand estimate can indirectly contribute to negative impacts. Overestimates of demand may also put unnecessary pressure on protected-area managers to redirect resources to increased infrastructure and facilities, reducing resources available for other aspects of management. Facilities

and infrastructure for visitors are often difficult to remove and an oversupply of these features can detract from the experience for some groups of visitors (Manfredo et al., 2002b).

Underestimates can also be problematic with managers having to respond in a reactive fashion to unanticipated pressures and crises. In addition to needing accurate estimates of the levels of demand for wildlife activities, both private and public sector managers need to understand the range of experiences sought and the different types of visitors involved. Without this understanding inappropriate products or services can be provided resulting in visitor dissatisfaction (Manfredo et al., 2002b).

Estimates of demand

Most discussions of non-consumptive wildlife tourism begin with the argument or assumption that this form of tourism is growing at a considerable rate or that there is increasing demand for such experiences from tourists (see Barnes, Burgess & Pearce, 1992; Amante-Helwey, 1996; Roe, Leader-Williams & Dalal-Clayton, 1997 for examples). A detailed analysis of these claims reveals some serious issues and gaps in the evidence provided to support them. Such statements are typically supported by examples that demonstrate high levels of current participation in particular activities, or growth in participation in a particular activity rather than direct evidence of growth in general. Davis and his colleagues (1997) provide a typical example with the claim that 'the demand for tourism activities based on interacting with wildlife has increased rapidly in recent years' (p. 261), supported by the statement that 'more than 600,000 people participate in whale and dolphin watching activities in Australia each year' (p. 262). It is also not uncommon to find support for statements about increasing demand for general wildlife activities based on statistics about recreational bird watching in the US (see Roe et al., 1997 for an example). Extrapolation to wildlife tourism in general from these situations is questionable (Boxall & McFarlane, 1993).

The use of the US Fish and Wildlife Service surveys is also particularly common (see Duffus & Dearden, 1990; Hammitt, Dulin & Wells, 1993; McFarlane, 1994). But the surveys referred to are usually from before 1990. While it is true that non-consumptive and non-residential wildlife recreation increased during the period from 1980 to 1990 (U.S. Fish and Wildlife Service 1991), the survey conducted in 1994/1995 indicated a decline during the period from 1990 to 1995 (U.S. Fish and Wildlife Service 1996). The 1996 report found a decrease of 17% in all forms of wildlife viewing and a decrease of 21% for non-residential wildlife viewing. The most recently available figures suggest an overall increase of 5% in wildlife viewing between 1996 and 2001, although the 2001 figure is still below the 1991 figure giving an overall decline in wildlife viewing for the decade 1991 to 2001 (U.S. Fish and Wildlife Service 2001).

Activity participation figures are also usually presented for only one point in time, often several years previous to the date of publication of the claim. Rarely are claims based on evidence of changes in participation over time. An exception to this is a recent article on whale watching showing an increase in both numbers of operators and participants across an extended time period (Woods-Ballard et al., 2003). It is also often assumed that these past growth rates will continue into the future. It is possible, however, that past growth reflects expanding opportunities or supply rather than increasing interest or demand from visitors. In this case, growth in participation reflects the take up of latent or existing demand. Once this existing demand is catered

for, the apparent growth may cease. In addition, growth in supply can result in a decline in demand for individual sites or operations. That is, a larger number of choices may mean that for any one operation there are fewer visitors. It is important to note that growth in any activity is not inevitable.

Another problem with using actual activity participation as a measure of demand or interest is that not all the tourists who participate in a wildlife tourism activity are motivated by the wildlife (Fredline & Faulkner, 2001; Fulton et al., 2002). That is, there is a tendency to assume that the wildlife is the central interest of all the participants. There are many different factors that can lead to participation in a tourist activity. For example, it is possible that a wildlife tourist activity is part of a larger tour program and that some participants are there only because they were interested in something else in the tour package. Further, some participants may also be there because they are accompanying others who are interested in the wildlife. Two other forms or motives for participation in tourist activities have also been identified. One is curiosity and novelty seeking and the other is a desire to experience as many of the tourist activities available at a destination as possible. Reid's (1996) study of whale-watchers in South Australia, for example, found that less than one third of the sample had travelled to the region to go whale watching, and only 37% engaged in the activity because of an interest in whales. One-tenth of the sample participated because they happened to be passing by and were curious, while another tenth were there because others had told them that it was an interesting experience. A further 12% were seeking a novel and different experience.

A final limitation of using an activity or product-based measure of tourist demand is that it misses those tourists who want or expect a wildlife tourism experience but who do not actually participate. Moscardo's (2000) analysis of visitors to the Whitsunday region of Queensland, for example, found that 22% of surveyed visitors who stated that 'opportunities to see wildlife/birds' was always important in their travel decisions did not, and were not going to, participate in any of the available wildlife tourism activities. Lack of participation can result from a number of factors including barriers such as cost, distance and time, poor information services, or perceptions that what is available is not appropriate.

Alternative approaches to estimating demand for wildlife tourism.

The major alternative approaches to measuring actual activity participation involve surveying or interviewing potential visitors before they arrive at a destination region, accessing actual visitors en route to the destination or sampling visitors from various locations within a destination (Fulton et al., 2002). The key feature of these approaches is to have a sample that is likely to include visitors who have not participated in the activities of interest. These surveys or interviews can involve questions about such factors as intended participation in wildlife activities, levels of interest in participating in such activities, or the importance of opportunities to participate in wildlife activities to their enjoyment and/or to their decision to travel to the destination region.

Table 9.2 contains a summary of evidence available on the importance of wildlife tourism opportunities in travel decision-making by major international travel markets. As can be seen, opportunities to see wildlife/birds is a very important factor in the decision making of these major international travel markets. These figures also indicate growth in the importance of wildlife tourism opportunities for the German

and Japanese markets. In a similar fashion Duda and Bissell (2002) report high levels of interest in wildlife viewing opportunities amongst the US residential population. Box 9.1 provides further information on levels of participation in wildlife viewing.

Results of studies conducted in Australia are consistent with these international patterns. A telephone survey of 600 domestic holiday travellers conducted for the QTTC (now Tourism Queensland) in 1996 found that 21% of the sample described 'a place where I can get close to nature and see wildlife' as essential in their choice of a holiday destination. Forty-two percent described this item as very appealing in a holiday destination. Another survey of 780 Australian households conducted for Tourism Queensland in 1998 (1999) found that the highest levels of interest were given to seeing animals in the wild from a list of 11 recreational activities. A survey of more than 2200 international and domestic visitors to the Whitsunday region of Queensland found that 34% of visitors rated 'opportunities to see wildlife/birds I don't normally see' as very important in their choice of a holiday destination in general (Moscardo, 2000).

Table 9.2: Interest in wildlife tourism opportunities

Importance in selecting an international holiday destination in general	Country	1985/86	1995/96
Opportunities to see wildlife/birds I don't normally see. (four-point scale from Not at all, through Not very and Often to Always Important)	**Germany**		
	Often important	29%	37%
	Always important	10%	38%
	Japan		
	Often important	14%	44%
	Always important	34%	25%
	United Kingdom		
	Often important	38%	38%
	Always important	32%	24%
	Netherlands (1993)		
	Often important	NA	62%
	Always important	NA	36%

Source: Moscardo, Woods & Greenwood, 2001, p. 19. Results are based on household surveys conducted in the country of origin and screened for long haul international pleasure travellers.

Box 9.1: Levels of participation in wildlife tourism activities

The authors of this chapter have been involved in a major research project aimed at understanding international markets for wildlife tourism activities. The project involves collecting surveys from visitors at a range of different types of wildlife-tourism setting or experience in a range of locations. To date the data set contains visitor profiles from nearly 5000 visitors to 15 different case study sites (three captive and 12 free-range) in Australia and New Zealand. The sample can be broken into the following geographic areas of usual residence:

- Australia (49%)
- UK/Ireland (14%)
- Other Europe (15%)
- USA/Canada (12%)
- Other Asia Pacific (10%)

The survey contains a number of questions but of particular interest here are the questions which ask about participation in a variety of wildlife activities in any location in the 12 months prior to the survey being conducted. The answers to these questions can be summarised as follows.

Number of visits in the last 12 months to a zoo, wildlife park or aquarium

Visitor Origin	None	One	Two or more
Australia	43%	23%	34%
UK/Ireland	31%	32%	37%
Other Europe	16%	21%	63%
Asia/Pacific	49%	23%	28%
USA/Canada	49%	24%	27%

In the last 12 months number of commercial wildlife-viewing tours taken

Visitor Origin	None	One	Two or more
Australia	68%	21%	11%
UK/Ireland	48%	28%	24%
Other Europe	52%	22%	26%
Asia/Pacific	59%	25%	16%
USA/Canada	50%	24%	26%

Number of visits in the last 12 months to places to specifically see wildlife (not on a tour)

Visitor Origin	None	One	Two or more
Australia	37%	28%	35%
UK/Ireland	33%	25%	42%
Other Europe	28%	27%	45%
Asia/Pacific	43%	25%	32%
USA/Canada	33%	24%	43%

Number of visits in the last 12 months to a place where wildlife might be seen (not on a tour)

Visitor Origin	None	One	Two or more
Australia	17%	26%	57%
UK/Ireland	18%	22%	60%
Other Europe	21%	19%	60%
Asia/Pacific	31%	23%	46%
USA/Canada	21%	23%	56%

As can be seen, overall there are very high levels of participation in a range of wildlife tourism activities, especially captive settings and environments where wildlife might be seen.

What types of wildlife experiences are sought?

The previous section has reviewed evidence on overall interest in seeing wildlife while on holidays and the importance of wildlife opportunities in travel decision-making. What this information does not provide is any understanding of the types of experience desired. For example, do visitors prefer to see wildlife in captive or natural settings? What level of facilities do they expect? What kind of interaction with wildlife are they seeking? These are important types of information for effective management (Lauber et al., 2002), and are explored further in Box 9.2.

Box 9.2: Desirable features in a wildlife tourist experience

A core objective of the research program described in Box 9.1 was to examine visitor preferences for different features of wildlife tourism experiences. Visitors were asked to rate the importance of different elements of a wildlife tourism experience. These 13 features were developed from an open-ended critical incidents approach in which people were asked to describe their best and worst wildlife tourism experiences.

The following is the overall ranking of these features from most to least important. Survey respondents were asked to choose the three most important factors for them as individuals from the list of thirteen. The percentages included in the list below indicated the proportion of the sample that included the feature in their set of three most important features.

- Seeing wildlife in their natural environment 67%
- Seeing wildlife behaving naturally 36%
- Rare and unique wildlife 33%
- Being able to get close to wildlife 29%
- Being in an untouched natural environment 26%
- A large variety of wildlife to see 25%
- A knowledgeable guide is available 19%
- Interesting information available about the wildlife18%
- A large number of wildlife to see 13%
- Being in a pleasant environment 12%
- The wildlife are easy to see 10%
- Feeling safe 8%
- Being able to touch or handle wildlife 7%

Overall the tourists surveyed in this study wanted to be able to get close to rare and unique wildlife behaving naturally in a natural environment. It is worth noting that a 'natural' environment is not necessarily a pristine or untouched environment. Further, there were differences in the importance of these features for different sub-groups of the tourists. Tourists from the Asia/Pacific region, for example, were less interested in seeing wildlife in a natural environment (59% gave this feature as one of the three that were important to them) than tourists from other areas, and more interested in getting close (33%), touching and handling wildlife (12%), and feeling safe (13%). British tourists, on the other hand, were more interested in seeing wildlife in a natural environment (73%) and in having a knowledgeable guide (25%), but less interested in seeing a variety of wildlife (18%). Other Europeans preferred information to be available (23%) rather than having access to a guide (6%). These tourists were also less interested in a large number of wildlife (8%), but more interested in seeing wildlife in a natural environment (76%). North Americans had higher levels of interest in rare and unique wildlife (42%), and in having a knowledgeable guide (26%), but were less interested in getting close to the wildlife (23%) and in being in an untouched natural environment (20%).

Demand for wildlife tourism experiences in natural versus captive settings

In general there appears to be a belief amongst authors that tourists have a preference for seeing wildlife in natural environments (Fredline & Faulkner, 2001), although the

evidence to support this claim is not strong. Pearce and Wilson (1995), for example, report that the two most important features sought by the international visitors to New Zealand who participated in a wildlife viewing activity, were natural surroundings and close proximity to the wildlife. Ryan (1998) in a qualitative study of 50 visitors in the Northern Territory concluded that in general visitors had a preference for seeing crocodiles in their natural environment. This conclusion is consistent with the results of a similar study conducted by the Department of Tourism, Sport and Recreation, Tasmania (1996) in which all of the 177 tourists surveyed stated that they would prefer to see wildlife in its natural setting.

An interest in seeing wildlife in natural settings does not, however, appear to preclude an interest in visiting captive settings. In the Tasmanian study the majority of visitors (94%) also agreed that they enjoyed visiting wildlife parks. Fredline and Faulkner's (2001) study of international tourists to Australia also found that visitors stated a preference for seeing wildlife in natural surroundings, but the majority (51%) described their most enjoyable wildlife interaction experience as having occurred in a captive setting. It is possible that visitors do not interpret the phrase 'natural surroundings' in the way meant by researchers. One explanation for the inconsistencies found in survey results could be that visitors see 'naturalistic' enclosures in captive settings as 'natural surroundings'. This is an issue worthy of research attention.

Demand for environmentally responsible wildlife tourism experiences

Another commonly stated claim in the tourism literature is that tourists are becoming increasingly concerned with the environmental aspects of tour operations and seeking 'greener' tourism products (Hasek, 1994; Jefferson, 1995; International Hotels Environment Initiative, 2002). As with the claims about increasing demand for wildlife tourism, a critical examination of the available evidence suggests a more complex situation. Phillips (1999) reports that while increasing numbers of consumers express more concern over environmental issues and state that they would consider green products, typically they are not willing to pay more for these products. Wearing, Cynn, Ponting and McDonald (2002) provide a detailed review of this issue and also note that there is not a direct link between environmental concern and actual behaviour. They conclude that 'the relationship between environmental awareness, intention and behaviour is tenuous, particularly in the context of tourism' (p. 144).

Demand for particular species

One area that has received considerable attention is that of visitor behaviour in captive settings, particularly zoos. The major research focus of this work has been on factors associated with longer viewing times and visitor satisfaction and learning. The latter area is covered in Chapter 12 of this book. A set of findings of interest to the present discussion of markets is that related to differences in visitor preferences for different wildlife species. After a substantial review of the literature and additional research focussed on most liked and disliked animals, Woods (2000) provided a set of features that were associated with greater preference for, and interest in, particular types of wildlife. According to this review, in general:

- Larger animals are preferred over smaller ones,
- Animals perceived as intelligent are preferred,
- Colourful, graceful and soft/fluffy animals are attractive to humans,

- Animals which are considered to be dangerous to humans are generally disliked but some predators, particularly big cats and crocodiles, attract attention, and
- Animals perceived as similar in appearance or behaviour to humans are preferred.

In addition some animals appear to attract human attention because of their cultural associations or iconic status. Animals such as bears, eagles, wolves, turtles and whales are used as symbols in various cultures for concepts such as freedom, strength and intelligence.

Characteristics of wildlife tourism markets

In addition to more accurate estimates of levels of overall demand for wildlife viewing activities, it is necessary to measure and profile different market segments or types of visitor. Duffus and Dearden (1990), point out that 'tourists cannot be considered an homogeneous population; even tourists that may primarily be motivated by the same stimulus, such as wildlife viewing' (p. 222). Despite these calls in the academic literature there has been little in the way of research into even the most basic characteristics of visitors to specific wildlife activities or attractions. Table 9.3 summarises some of the findings from the available published research comparing wildlife and non-wildlife tourist markets. As can be seen, there are few consistent patterns and this confirms Duffus and Dearden's (1990) argument that there are many different types of wildlife tourist.

Table 9.3: Some studies of differences between wildlife tourism markets and other tourists

Study	Major Results
Boxall & McFarlane, 1993 (Participants in a Christmas bird count, Canada)	Wildlife tourists were more likely: • To be older • To have higher levels of education
Pearce & Wilson, 1995 (International tourists to New Zealand)	Wildlife tourists were more likely: • To stay longer • To travel further • To spend more • To be younger • To have higher education levels and incomes • To be independent travellers
Moscardo, 2000 (Tourists to the Whitsundays, Australia)	Wildlife tourists were more likely: • To stay longer in the region • To be independent travellers
Fredline & Faulkne,r 2001 (International visitors to Australia)	Wildlife tourists were more likely : • To be younger • To travel further • To stay longer • To be on a package tour
Moscardo et al., 2001 (Tourists to Tasmania, Australia)	Wildlife tourists were more likely: • To be female • To be younger, independent, longer stay • To use the internet for information

Level of specialisation

Many of the published studies that are available have been concerned with using specialisation as a core dimension for categorising and describing different visitors in wildlife situations. Duffus and Dearden (1990) were the first to adapt this concept from leisure activities in general to non-consumptive wildlife activities. They made a distinction between experts/specialists and novices/generalists. This basic distinction

has been used in a number of studies (see Manfredo & Larsen, 1993; McFarlane, 1994; Martin, 1997; Cole & Scott, 1999). In general more specialist wildlife watchers:

- Use a wider range of information sources
- Seek a wider range of species to view
- Are more interested in interpretation/education
- Are more interested in rare species
- Have higher levels of physical activity

Visitor responses to management strategies

In most cases strategies to manage the impacts of wildlife tourism activities on the natural environment or wildlife involve attempts to change or limit visitor behaviour, often through restricting access to the wildlife. The limited research evidence available suggests that when limitations are supported by appropriate interpretation, visitors will adhere to restrictions to their activities. Harris et al. (1995), for example, found that 49% of visitors to the Pusch Ridge Wilderness in Arizona were willing to have their recreational activities prohibited or restricted to protect the mountain sheep populations that live in that area. Frost and McCool (1988), in a study of visitors viewing the bald eagle migration in Glacier National Park, found that 90% of those visitors who were aware of various restrictions on their behaviour believed that the regulations were necessary. Fifty-six % further stated that the restrictions had no impact on their experience, with 32% stating that the restrictions enhanced their experience. In this case the restrictions included limited access to certain areas of the park, limits to numbers of visitors allowed into viewing areas and the requirement that visitors can only enter the viewing areas with a naturalist. Davis (1998) compared the enjoyment ratings of people swimming with whale sharks in Western Australia before and after changes to regulations that increased the distance between swimmers and the sharks. He found no change in overall satisfaction and a decrease in perceptions of crowding.

A number of negative impacts has been identified as resulting from visitors feeding wildlife (see Chapter 5). As a consequence many management agencies and managers of captive settings are restricting or prohibiting feeding. Often such actions are opposed by tour operators because of a belief that visitors expect and enjoy feeding and that the restrictions will severely impact upon visitor enjoyment. In many cases prohibition of feeding also results in greater difficulties for visitors accessing and seeing wildlife. There is, unfortunately, very little information available to inform this debate. Kreger and Mench (1995) have suggested that feeding results in movement and interaction, both factors that are sought by visitors, and that feeding may represent ‘a way for the visitor to express a caring and nurturing interest in the animal’ (1995, p. 147). Orams (2002) also suggests a number of potential visitor motivations for feeding wildlife including the opportunity to interact and get closer to the animal, companionship and a general concern for animal welfare. There is, however, little empirical information currently available on why visitors feed wildlife, what they hope to achieve and what might act as a substitution for this activity.

Visitor satisfaction with wildlife tourism experiences

A small but growing number of research studies has investigated satisfaction with wildlife tourism opportunities. In most cases overall satisfaction levels are high and some recurring themes have begun to emerge. Table 9.4 contains a summary of the

key findings of these studies with regard to the factors found to be significantly related to overall satisfaction and enjoyment. Factors found across several studies to be related to overall satisfaction include:

- The variety of animals seen;
- Particular features of the animals;
- Being able to get close to the wildlife;
- Seeing large, rare or new species;
- The natural setting itself; and
- Being able to learn about the wildlife or the setting.

Table 9.4: Summary of factors related to satisfaction with wildlife activities

Study	***Factors contributing to enjoyment/satisfaction in order of importance***
Leuschner et al., 1989 (Specialist) birdwatchers in Virginia	Seeing species not previously seen Seeing many different species Seeing rare or endangered species
Duffus & Dearden 1993 Whale-watching tours on Canada's Pacific Coast –Killer Whales	Seeing whales Getting close to whales Seeing displays of whale behaviour Seeing coastal scenery Having a naturalist/crewmember to answer questions Seeing other marine mammals
Hammitt et al., 1993 Wildlife viewing in the Great Smoky Mountains National Park	Seeing many different kinds of wildlife Seeing black bears Seeing white-tailed deer Seeing a larger number of animals Being a first time visitor Using binoculars/telescopes to see wildlife Taking photographs If numbers seen matched expected numbers
Davis et al., 1997 Whale Shark Tours in Western Australia	Being close to nature Seeing large animals Seeing many different types of marine life Excitement Learning about the marine environment Adventure Underwater scenery Freedom Relaxation Being with friends
Johnston, 1998 Review of research in zoos	Naturalistic enclosures Size of animals Invisible barriers Proximity to the animals
Tourism Queensland, 1999 Whale watching in South East Queensland, Australia	Number of whales seen Being in a travel group other than a family Being a repeat visitor to the destination Being a domestic visitor On board commentaries Smaller boats
Foxlee, 1999 Whale-watching in Hervey Bay Australia	Numbers of whales seen Distance from whales Whale activity Information available about whales Information available about other marine life The style in which information was presented
Schanzel & McIntosh, 2000 Penguin-viewing in New Zealand. Note: The setting provides a series of covered trenches and camouflaged viewing hides, which allow visitors to move around within the penguin nesting area with minimal disturbance to the birds.	Natural habitat and behaviour Proximity to the penguins Educational opportunities Innovative/novel approach Fewer other people present Presence of infant penguins
Moscardo, Woods & Greenwood, 2001 Study of best and worst wildlife experiences	Being in a natural environment Getting close to animals Education/interpretation Seeing a variety of species Seeing live animals – only previously in books or on television

A model for understanding visitor satisfaction with wildlife-based experiences

Reynolds and Braithwaite (2001) offer the most sophisticated model to date to explain and predict tourist responses to wildlife tourism experiences. According to this model every wildlife-based tourist experience can be organised or measured using six key factors:

- Intensity or excitement of the experience
- Authenticity or naturalness of the experience
- Uniqueness of the experience
- Amount of visitor control over the experience
- Popularity of the species
- Species status in terms of being rare and/or endangered

According to this model, which is supported by some preliminary evidence reported in the same article, authentic or natural encounters which are seen by the visitors as unique, intense or exciting and which give the visitors a sense of control are likely to be seen as positive and rewarding experiences. In addition visitors should be more interested in rare and unusual animals.

These hypotheses are very similar to those that would be predicted from a 'mindfulness' perspective (see Chapter 12 for more details of this concept). The mindfulness concept comes from social psychology where it has been used to explain a large variety of everyday behaviours (Langer, 1989). Mindfulness theory proposes that in any given situation a person can be mindful or mindless. Mindfulness is a state of active cognitive or mental processing. Mindful people are paying attention to the information available in the environment around them, reacting to new information and learning. Mindless people, on the other hand, follow established routines or scripts for behaviour and pay minimal attention to the environment and new information.

Outcomes associated with Mindfulness include perceptions of personal control, excitement, learning and satisfaction. By way of contrast, mindless visitors are more likely to report boredom, a lack of control and interest in the experience and dissatisfaction. Mindful visitors are more likely to be satisfied and to pay greater attention to both the information that is provided to them and to their own behaviour. Mindful visitors should thus be more inclined to engage in minimal impact behaviours and pay greater attention to management strategies and interpretation. Clearly both public and private sector managers should be seeking ways to encourage mindful visitors.

So what then are the conditions that contribute to mindfulness? Features associated with active mental processing include:

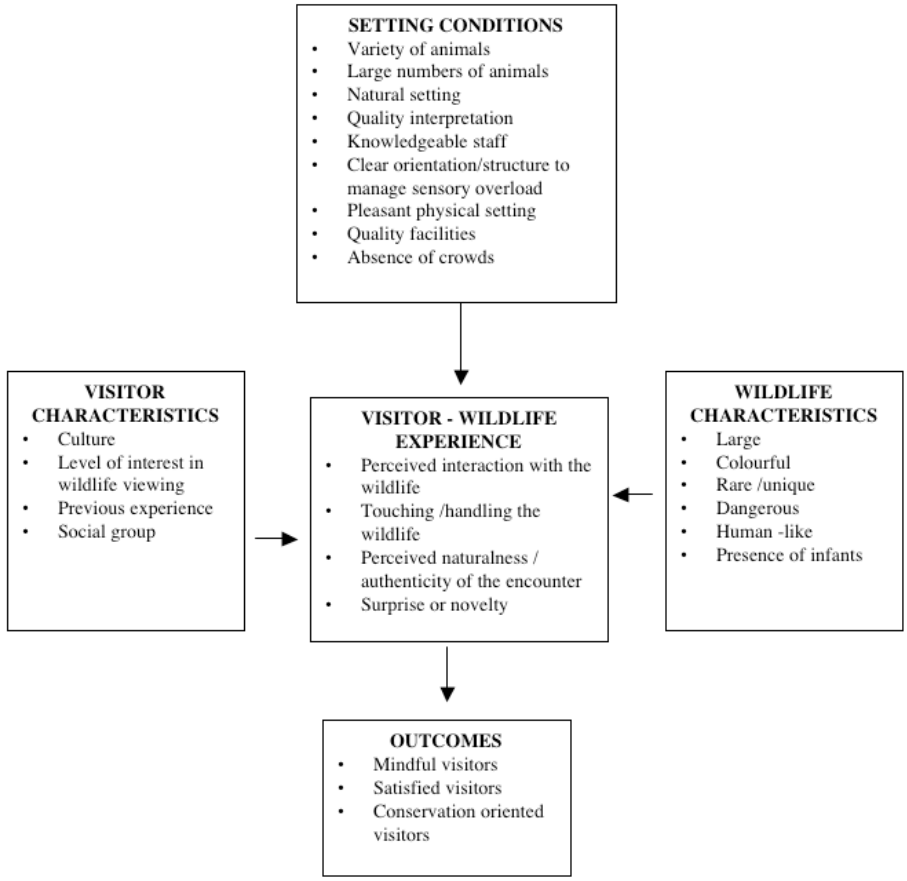
- Variety or change in an experience;
- Personal control or choice;
- Personal relevance and/or importance;
- Opportunities to interact with objects and people; and
- Multi-sensory experiences.

In addition to these features there is also a number of setting conditions that can hinder mindfulness and these include fatigue, disorientation, crowding, sensory overload and safety concerns. There are also features of the individuals that can

interact with the setting conditions to influence mindfulness. These include motivation or interest in the wildlife, previous experience with the activity, existing levels of knowledge about the activity and social group interaction. It should also be noted that mindfulness is a necessary, but not sufficient, condition for learning and satisfaction. For example, a visitor may be mindful but frustrated by the poor quality of the service or interpretation or interpretation provided.

Figure 9.2 takes the mindfulness concept and applies it to the wildlife tourism experience. The model incorporates predictions from a mindfulness approach with what is known about the features associated with visitor satisfaction from previous wildlife viewing research. The model thus serves as both a summary of the existing research and also begins to suggest predictions related to visitor behaviour and responses in wildlife tourism settings.

Figure 9.2: A mindfulness model of wildlife-based tourist experiences



Some management implications of the mindfulness model

A number of management principles can be derived from the mindfulness concept and model. The first of these is variety. It is important that wildlife tourism operators and managers do not rely solely on the passive viewing of wildlife and instead offer a

range of different styles of activity to support and enhance the wildlife-viewing experience.

A crocodile spotting tour in North Queensland provides an example of the ways in which variety can be incorporated into a small day tour. Firstly, while the tour is centrally concerned with crocodiles, the guide also seeks out other species so that in any one tour a number of different animals are seen. In addition the guide uses visitors to assist in setting up spotting equipment and in organising various components of the trip giving them a range of different levels of physical activity. The tour includes both time spent on the boat and time spent walking at a beach and through a mangrove area and it also provides opportunities to meet local residents and to engage in some fishing. Finally the commentary provided includes information about the crocodiles, historical aspects of the area and ecological information about the mangroves.

In this crocodile tour example a number of the activities included in the program provide opportunities for guests to actually participate in activities rather than simply passively view the wildlife. Participation is the second core mindfulness principle. Participation not only encourages guests to get physically and mentally active, it also gives guests some sense of control over what is happening. Control is the third principle for encouraging mindfulness. Another way to enhance participation and control is to help guests develop their wildlife spotting skills with briefings and introductory sessions. In those settings where many species are likely to be seen, control can also be enhanced by giving assistance to guests to make choices. Options include developing brochures or maps with suggested itineraries or routes and providing themed self-guided or guided tours that select a subgroup of species related to the theme.

The mindfulness model also provides some directions for dealing with management challenges. The issue of touching and handling wildlife, for example, is of concern in many wildlife tourism situations. Generally it raises many of the same problems and challenges as wildlife feeding. As with wildlife feeding, touching wildlife is clearly a very rewarding experience for many visitors (Moscardo et al., 2001). The mindfulness model predicts that visitors will respond favourably to opportunities to touch and handle wildlife because it involves a multi-sensory experience, it offers an intense interactive experience and it provides visitors with greater control over the interaction. These are all factors that have been found to be related to mindfulness. If this is undesirable then managers need to find ways to substitute for this experience and the mindfulness model suggests replacing it with other activities that offer visitors control, that are multi-sensory and that engage the visitors in interaction. A mindfulness approach offers a number of dimensions or principles for designing more structured and rewarding wildlife tourism experiences.

Future directions

The management of wildlife tourism requires management of both the wildlife and the tourists. The management of tourists requires information on a number of aspects of these tourists. Firstly it is important to understand levels of demand for different wildlife tourism activities. Judgements about the amount of infrastructure required to manage visitors at various sites, decisions about the number of staff required and awareness of possible pressures on the setting and the wildlife all require accurate measures of demand. Different visitors also have requirements or expectations for different types of management, so it is also necessary to understand levels of demand

for particular types of experience. Much of the existing data on wildlife tourism demand is fragmented and relies heavily on data collected for quite specific settings or species. Wildlife tourism managers in both the public and private sector would benefit from more coordinated, systematic measures of demand for particular types of wildlife experience. Such measures should include both attendance and participation rates but also more broadly based surveys so that latent demand is incorporated into management decisions.

This chapter has proposed a mindfulness model that suggests a number of factors that should encourage both increased satisfaction and minimal impact behaviours. This model is still in development and a number of limitations are apparent in the nature of the mindfulness model, which includes many variables without specific predictions. Clearly there is a need for a much wider range of studies into the human dimensions or market characteristics of wildlife tourism experiences to determine which factors, or combinations of factors, listed in this model are most closely related to positive outcomes.

Finally, it is important to further explore the extent and implications of the outcomes of wildlife tourist experiences. It has been claimed that wildlife experiences can encourage a positive attitude towards nature and enhance nature conservation attitudes and behaviours. To date, however, the evidence of this is limited. Ultimately the challenge for those responsible for wildlife tourism is to both demonstrate these benefits and enhance them. The challenge for wildlife tourism researchers is to better understand the factors that contribute to these outcomes.

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Chapter 10

Business Issues in Wildlife Tourism

Sue Beeton

Introduction

Business health and survival is the basis of any industry, and wildlife tourism is no different. Business viability is also an integral component of sustainability, which relates to economic as well as social and environmental sustainability (see also Chapter 8). Current research and anecdotal evidence on nature-based tourism and wildlife tourism enterprises indicate that many businesses are not doing well financially (McKercher, 1998; Beeton, 1998; Higginbottom et al, 2003). For example, two-thirds of kangaroo-related tourism enterprises believe that managing their business was the most complex and difficult aspect of their operation (Higginbottom et al., 2003), underlining the need for a discussion of business management issues. Businesses involved in wildlife tourism range from large commercial concerns through to small businesses, community-based enterprises, not-for-profit and government-owned operations of all sizes. In addition, as has been recognised in previous chapters, there are many generic tourism businesses that incorporate a wildlife component into their operations.

This chapter deals with business management of wildlife tourism enterprises. It takes into account the varied business needs of different enterprises by adopting a strategic approach towards the business of wildlife tourism. While not intending to be a 'how-to' chapter, potential and existing operators as well as students and planners will find guidance in business elements that are crucial to wildlife tourism operational success. The main issues that are addressed in this chapter will also benefit government agencies and industry associations by pointing out the various business elements that wildlife-tourism operators have to deal with. Academics will also find the chapter indicates many areas for research into generic as well as specific business issues facing wildlife tourism.

While recognising the variations in business sizes, structures and goals, the main focus of this chapter is on small to medium-size wildlife-tourism enterprises (SMWTEs). They make up the majority of wildlife tourism enterprises and their proprietors and staff are often less experienced in business operations than those of large enterprises, and less able to employ additional expertise (see McKercher, 1998; Beeton, 1998; Beeton and Graetz, 2001). Higginbottom and Buckley (2003) also note that the majority of wildlife watching operations in Australia are small businesses, which is similar around the world.

Often operators of medium-sized and micro tourism businesses report that their motivation to start their business was '… not to make money, but to enjoy the lifestyle and participate in environmentally worthy pursuits', and this also seems to be the case for many wildlife tourism operations (Higginbottom et al., 2003). It can be argued however, that 'making money' is still important in order to maintain the operation both for a financial and sustainable perspective such as contributing to environmental projects (Bridge and Moutinho, 2000).

One of the major practical issues identified in numerous studies is the lack of time that many SMWTE owners have for the management and administration of their

business, as many are directly involved in the day-to-day operations of their enterprise, as guides, drivers and hosts (see McKercher, 1998; Beeton and Graetz, 2001; Higginbottom et al., 2003). This significant hurdle is endemic to many SMWTEs, and while not wanting to over-simplify the complexities involved in tourism management, this chapter aims to provide basic business planning information for wildlife tourism managers and planners in a timely and relevant manner. In addition, many wildlife tourism business owners/managers have little, if any, formal business training and limited scope to employ specialist personnel (Beeton and Graetz, 2001; Higginbottom et al., 2003).

Wildlife tourism has been broadly defined in Chapter One as tourism based on encounters with non-domesticated animals. Wildlife tourism businesses include small businesses such as tours on public land (or water), farmstays that incorporate a wildlife component, fishing, hunting parties, small zoos/conservation parks and research stations. Some of the larger wildlife tourism businesses include aquaria, zoological gardens (many of which are government supported), national parks and even certain theme parks that have incorporated wildlife as one element of their attraction. While some zoos and theme parks are mass tourism enterprises, the majority of wildlife tourism activities are considered to be in smaller, niche-tourism business enterprises. Wildlife tourism enterprises can be run as private for-profit businesses, community-based enterprises, not-for-profits (especially research stations) or government-controlled enterprises on public land. All types of enterprise need to be sustainable from a business aspect as well as environmentally and socially. In essence, they need to be profitable or at least self-funding. Consequently, while there are different business structures involved and business management can be a complex field, basic business theory can be applied to address the main recurrent issues that small to medium wildlife tourism enterprises face.

Following is a discussion of the more significant business management theories and how they relate to wildlife tourism, with an outline of the sectors and organisation of the overall tourism industry, planning issues and packaging. The development of tourism accreditation/certification is introduced, and elements of best practice are identified. The chapter concludes with a brief outline of the significance of developing and supporting the concept of 'best practice' in wildlife tourism.

Wildlife tourism and business management theory

Much has been written on business management, some of which can be applied to wildlife tourism. The following theories have been selected as examples, however this is not an exhaustive discussion of tourism business management. As Leiper succinctly explains, '[m]anaging is about imposing and maintaining order of some kind in purposeful human organisations, appropriate to its aims' (Leiper, 2003: 116). The theories introduced below are some of the ways to create 'some order', such as business strategies that utilize tourism alliances. Concepts of competition theories from major business researchers and commentators, Porter (1998), Lampel and Mintzberg (1996), Drucker (1997) and Leiper (1995) are introduced, tracing the shift in business behaviour from pure competition through to cooperation, customer focus and the current knowledge-based focus, and how this relates to wildlife tourism.

In terms of developing competitive business strategies, Porter (1980) identified three broad categories, namely cost leadership, differentiation and focus. Companies following a cost leadership strategy aim to produce their goods or services at a lower

cost than their competitors, enabling them to achieve higher profit margins or sell their product or service at a lower price. Economies of scale are usually required to achieve this, with companies requiring a high market share, and in a tourism context this is most prevalent in mass tourism. Differentiation strategies aim to provide a perception in the market place that there is a unique element of the product or service for which customers will pay a premium. This requires a clear understanding of customer desires and usually a high investment in market research and product development. Finally, the focus strategy is directed towards a specific market need or niche, and is a strategy in tourism that is receiving much attention, generally sitting well with much of wildlife tourism, which requires a concentrated approach.

While the above model has been used to study the way that some tourism enterprises operate (see Kling and Smith, 1995), many tourism businesses operate (or co-operate) in what Porter has identified as business clusters. He defines such clusters as '… a critical mass of companies in a particular location (a country, state, region or even a city)' (Porter, 1998: 7). Porter challenges the traditional notion of competing organisations working independently, in direct, aggressive competition with similar businesses. Restaurants, motels and attractions that cluster in similar areas have found that their business increases as a larger market is attracted to the area. Ritchie et al. (2003), among others, refer to this as 'coopetition'. Classic examples of tourism clusters include Las Vegas, Hollywood Boulevard and even ethnic areas such as the Chinatowns in many western cities. Wildlife tourism clusters are often located around national parks.

One significant example of coopetition in the tourism industry has been the development of strategic alliances among airlines. This type of cooperation has come from the need to gain further competitive advantages in a highly regulated and costly industry. The US Federal Aviation Administration (FAA) defines an alliance as '…a merging of resources, operations, or financial interests between entities [such as] an air carrier or a repair station and could involve the sharing or parts of the utilisation of mechanics, pilots and flight attendants' (FAA, 1995: 95-06). Airlines mainly enter into alliances in order to gain entry into difficult-to-enter markets (especially restricted domestic markets in countries other than the airline's home) and to expand their market share (Vander Kraats, 2000). The benefits of developing such alliances are outlined in Table 10.1.

Table 10.1: Airline alliance benefits and issues

Alliance Element	Benefit	Potential cost
Code sharing (different airlines using the same flight number over various legs of a route)	• Added revenue due to increased customer traffic • Multiple listing of a single flight causes a crowding out effect on Computer Reservation System display, encouraging reservations for those flights • Greater combination of flights in various markets	• May be detrimental to competition • Market may become dominated by a few 'mega-carriers' • Can mask anticompetitive arrangements (limiting capacity of airports, raising fares) • May create more barriers for emerging airlines
Joint frequent flyer programs	• More benefit alternatives for customers • Larger network from which to collect frequent flyer miles • Preferred use of allied airlines, increasing customers	
Cross-border feeding	• Seamless service through an international hub to large set of domestic destinations	
Schedule coordination	• Reduction of waiting times between connecting flights	
Resource sharing	• Elimination of staff duplication at airports • Joint marketing	
Airport access (terminal slots)	• Access to congested international airways through sharing and exchange of slots and terminal facilities	
Technical cooperation	• Sharing of maintenance, emergency equipment and information systems	
Travel agent commission overrides	• Increased travel agent incentives to book alliance partners	
Halo effect	• Travel agents'(and others) tendency to book more on a carrier associated with a brand they know	

Source: Gudmundsson (1999); Vander Kraats (2000)

In all business there has been a shift from standardisation of production processes and products towards various levels of customisation along with corresponding changes in management theory. Lampel and Mintzberg (1996) argue that there is a continuum along which businesses operate, from pure standardisation through various levels of customisation (segmented, customised, tailored, pure). This has a strong resonance in the wildlife tourism industry, and while Lampel and Mintzberg do not specifically refer to tourism per se, they note that resistance to standardisation ' … has been common in transportation [and] leisure … where firms often respond to the needs of individual customers despite the ceaseless drive toward greater economies of scale' (Lampel and Mintzberg, 1996: 23). Table 10.2 summarises the series of customisation strategies they have identified and relates them to certain types of industries, from mass through to 'thin' or niche types of operation. The table illustrates their point that there are different levels of customization/standardisation in different elements of a business (processes, products and transactions), rather than a single overall strategy. The terms used in the table are self-explanatory in that they move through levels of customisation strategies, where the highest level is that of 'tailored customisation', where an item is made exactly to each customer's requirements. Customised standardisation, on the other hand, referring to this as products where the customer selects from a range of components to create their 'own' product.

Table 10.2: Industries by level of customisation (standardised – tailored customised)

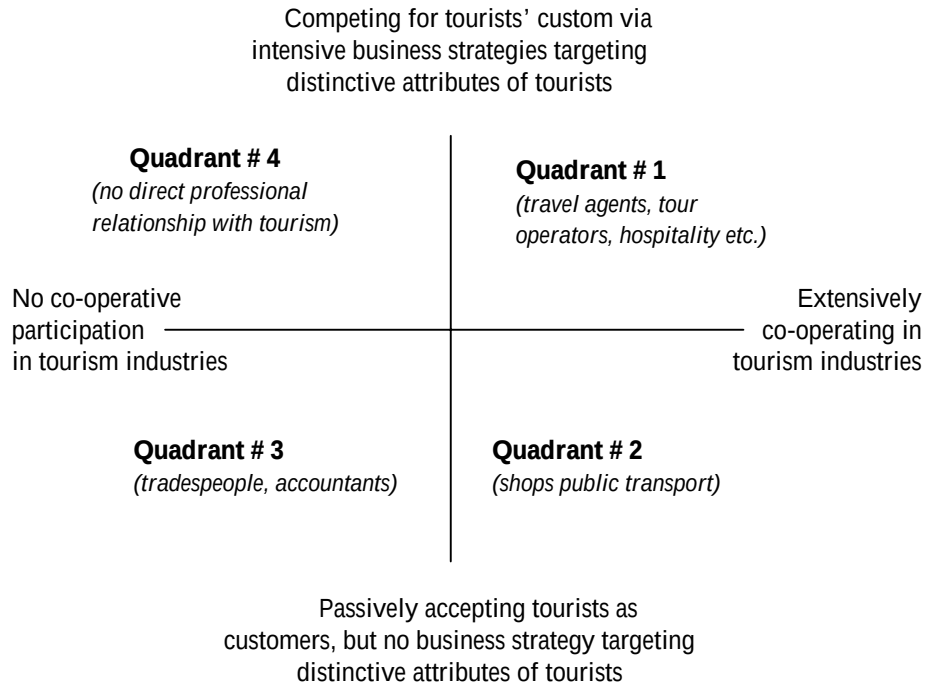
Industry	Process Strategies	Product Strategies	Transaction Strategies
Mass	Standardisation	Standardisation	Standardisation
Bulk	Standardisation	Standardisation	Customisation
Catalogue	(Segmented) Standardisation	Segmented Standardisation	Standardisation
Menu	Customised Standardisation	Customised Standardisation	Customisation
Routing	Customised Standardisation	Customised Standardisation	Standardisation
Agent	Tailored Customisation	Tailored Customisation	Standardisation
Tailoring	Tailored Customisation	Tailored Customisation	Customisation
Thin	Customisation	Customisation	Customisation

Source: Lampel and Mintzberg (1996)

Reflecting the shift towards customer-centred business operations, Peter Drucker, known as 'the father of management' claimed that the only purpose of a business is to create a customer (Palkon, 1998). Drucker (1997) went on to acknowledge the further shift in management concepts of 'competitive advantage' from being linked with money and technology to being linked to knowledge and knowledge workers. He notes that knowledge 'constantly makes itself obsolete, with the result that today's advanced knowledge is tomorrow's ignorance' (Drucker et al, 1997: 20). This shift has significant impact on where, how and who takes holidays, as the more-developed and less-developed countries come closer together through knowledge development. This chapter is not the forum for an in-depth discussion of the emerging knowledge economies, however it is important to recognise the increasing shifts around the world that will affect existing travel patterns and markets. Being a service industry, tourism operations must primarily focus on providing its customers what they want. Consequently a wildlife tourism enterprise must decide who its customers are (or will be) through undertaking marketing research as well as using existing marketing information from sources such as government agencies, marketing publications and academic institutions.

Leiper (2003) has identified four business strategy positions that tourism organisations have taken in terms of their relationship with the tourism industry (see Fig 10.1), which refers to this as 'industrialising' tourism.

Figure 10.1: Business strategies of tourism-related organisations – Leiper's Partial Industrialisation of Tourism Model



Source: Leiper (2003)

This model can be used to consider wildlife tourism enterprises in terms of their business strategies and relationship with the tourism industry (outlined in the next section). Quadrant 1 is where the majority of businesses that specialize in tourism (such as travel agents, tour operators, transport, accommodation) fit, while Quadrant 2 describes businesses that supply goods or services directly to tourists, but do not actively connect with the tourism industry, such as shops and public transport networks. Quadrant 3 relates to goods or service suppliers such as tradespeople and accountants who do so in an incidental manner, not having any direct participation in the tourism industry. Quadrant 4 is relatively uncommon, where a business has no direct strategies for tourism, but belongs to tourism industry associations. For example, an educational institution may belong in order to meet its civic duty, motivated by a belief that tourism is good for the local community (Leiper, 2003). Research on a small coastal tourist town in Australia identified such a group of residents who were members of their local tourism association, not only to support tourism but also to protect their lifestyle from over-development (Beeton, 2001). Leiper suggests that this model can be used to plot wildlife tourism-related businesses within a region, illustrate the relationships between them and the industry, or to trace changes in a business in terms of its 'industrialisation' (links with the tourism industry) over time.

However, as Lampel and Mintzberg (1996) point out, whatever business management models and theories are applied, there is no 'one best way' in terms of best-practice. In the field, managers tend to adopt a mixture of strategies that best apply to their needs and the current environment. A final comment from Lampel and Mintzberg puts this into context:

> Managers, however, often have to ignore the theorists' generalities because their own work brings them into specific contexts that are nuanced and, therefore, unusual – at least compared with standardized theory (Lampel and Mintzberg, 1996: 29).

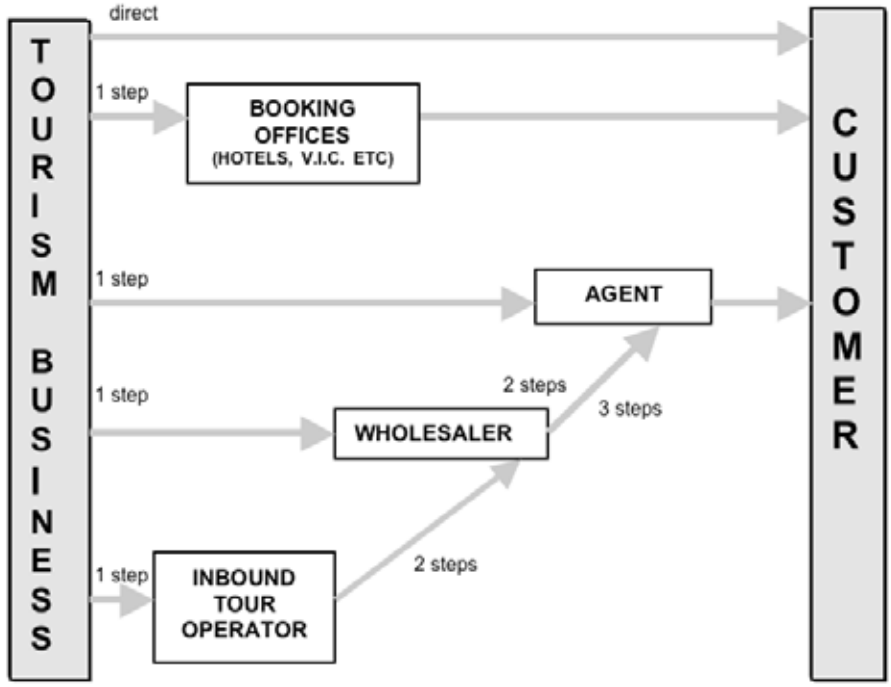
The tourism industry: sectors and distribution systems

The term 'industry' denotes a cohesive, identifiable group, such as the automotive industry or the airline industry. However, the 'tourism industry' is by its very nature diverse, traditionally fragmented and even described as amorphous, and not easy to identify. Consequently, this 'industry' can be segmented in various ways, and for the purpose of studying wildlife tourism business-management, it is most relevant to look at it in terms of business sectors.

Three over-arching business sectors are commonly used when describing the industry, namely hospitality, travel and visitor services. The hospitality sector includes business such as food and beverage, casinos and gaming, resorts and accommodation, while the travel sector can be separated into two sub-groups, operational and intermediaries. Operational businesses are those involved in transport and passenger services (including airports), while intermediaries are businesses such as travel agents, tour wholesalers and inbound operators. Visitor services encompasses attractions, MICE (Meetings, Incentives, Conventions & Events), tourism agencies (government and non-government) and information services. All of these sectors have the potential to be involved in wildlife tourism, to varying degrees.

Tourism products are perishable in that once an airline flight has left, or a night has passed, the specific product for that date/time cannot be sold. In other words, tourism products cannot be stocked indefinitely (Page et al., 2002). This situation has led to the development of an enormous number of intermediaries selling tourism products on behalf of tourism businesses. Such intermediaries are a central element of the tourism distribution system, which is the network that tourism operators use to place their product in the market, as illustrated in Fig. 10.2. Understanding the distribution system is crucial for any tourism business, yet it is an area that many SMWTEs fail to appreciate, especially those in rural areas where many wildlife tourism enterprises are based. Such misunderstandings have resulted in many tourism business failures (Beeton, 2002).

Figure 10.2: Simple Tourism Distribution Model



Adapted from McKercher, 1998

A business can choose to sell directly to its customers ('direct distribution'), use a range of intermediaries or a combination of both. A small business that offers a limited product range to a very specific market may tend to focus on direct selling, with a limited use of very specialized intermediaries, whereas a more diverse business targeting a range of markets will most likely use a more complex mix of distribution choices (McKercher, 1998).

The direct distribution system is the simplest way to reach prospective clients, but is also limiting as it requires those working in the operation to be selling it as well. This can be extremely time-consuming and in the end not cost-effective as it takes the business owner away from operating the business. Direct sales can be done via the telephone, over the Internet, by walk-in business, direct mail or by your own sales force (often the business owner). This makes sense when the market is close, such as near a major city, the traveller is familiar with the product (such as kangaroos!), repeat visitation is high, or the capacity or season is limited. In particular, as many wildlife tourism businesses are based in rural/remote areas, promoting to the market and operating the business can actually be mutually exclusive – the need to have a physical presence in the tourist generating marketplaces can take the operator or manager away from the business.

A one-step system uses one intermediary to sell on behalf of the operator, such as a retail travel agent, regional booking office, hotel tour desk, motoring organisation or state government bureau (McKercher, 1998; Page et al., 2002). These intermediaries

generally charge a standard commission rate of around 10 percent of the full retail price. However, a retail travel agent may not be prepared to take the time to book a $100 wildlife tour or $10 entry to a park as the return for their time is too low. So, many smaller operations take a two-step distribution approach.

A two-step system includes tour wholesalers, who package the product for sale through travel agents. The advantage here is that a small tourism operation is grouped ('packaged') with other product to make a larger, more saleable product. This relates to business clustering and cooperation discussed earlier, but can also bring disparate products into one package. For example, a wildlife tourism experience could be combined with a tour of a capital city and visit to a theme park. As wholesalers rarely deal directly with the general public, preferring to sell through travel agents, they charge a higher commission rate of around 25 percent commission (15 percent for them, 10 percent to travel agent). Packaging is discussed in more detail later in the chapter.

If a wildlife tourism business wants to attract international visitors, they generally take a three-step approach to distributing their product, which incorporates an inbound tour operator who packages the local 'land' content, then sells it to the (overseas) wholesaler and travel agent. The inbound operator has to pass on the appropriate commissions to the overseas partners, so the commission here is around 45 percent. Some travel companies have separate divisions that cover the three types of intermediaries described above – a retail travel arm, wholesaling and inbound tour operations. However, this generally does not lower the commission rates!

When many wildlife (and other) tourism operators look at the commissions required, they initially decide that direct distribution will be most financially effective for them. However, they fail to take into account other costs such as marketing and promotion that is done by the intermediaries. This is a significant benefit as the intermediaries are generally highly skilled in this field and understand their particular markets. Such knowledge can assist SMWTEs significantly, considering that marketing and promotion are regularly identified as areas of need by operators (Beeton and Graetz, 2001). While some intermediaries are now charging a fee for inclusion in their brochures (on top of their commissions), this is still an extremely cost-effective sales technique. For a start, the commissions are only paid on actual sales, whereas the direct-marketing costs exist whether there are any sales or not. Also, the agent is actually based in the tourism-generating region, reducing the need for the operator/manager to leave their business.

Where many SMWTEs fall down when costing their product is that they do not take into account these commission rates, so are unable to take advantage of the system without dramatically increasing prices. Adopting a price penetration policy and working on low margins is not advisable and has been instrumental in the downfall of many tourism operations, particularly in the nature-based field, which includes wildlife tourism (Beeton, 2002).

It is important also to remind business operators that it is neither ethical nor advisable to offer different rates for customers who deal directly with the business and those who come through an intermediary. This invariably leads to being banned by the intermediaries and stands to severely damage the business.

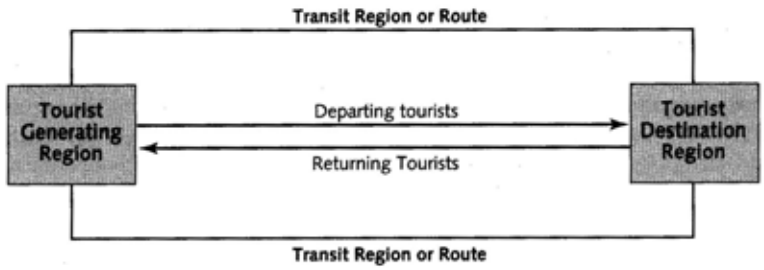
For most wildlife tourism businesses, using the travel trade intermediaries or going direct to the customer is not an 'either/or' decision, but a question about how much of each type of distribution (one, two or three step) to use. Deciding to use intermediaries

will depend upon whether there is a large, year-round capacity, or a desire to target a specific international market or a niche-segment such as educational tours (The Tourism Company, 2001). The mix will tend to change over time as the wildlife tourism markets change, so needs to be re-considered regularly. This can be done during the regular business planning review process.

Organisation of the industry

The distribution system outlined above briefly describes the organisation of the travel-trade/intermediary segment of the industry, however it is also important for wildlife tourism enterprises to understand the other elements of the tourism industry and how they are 'organised'. As already noted, this is not easy to do due to the amorphous nature of what we are attempting to describe, and to add to the confusion, each introductory text on tourism has its particular approach (see Weaver and Oppermann, 2000; Page et al., 2002; Goeldner et al., 2002; Hall, 2003; Leiper, 2003). However, Leiper's (1995) model of the tourism system is widely accepted, comprising a generating region from which tourists come and a destination region (where they go), with them travelling through the transiting regions on their journey to and from the destination (Figure 10.3).

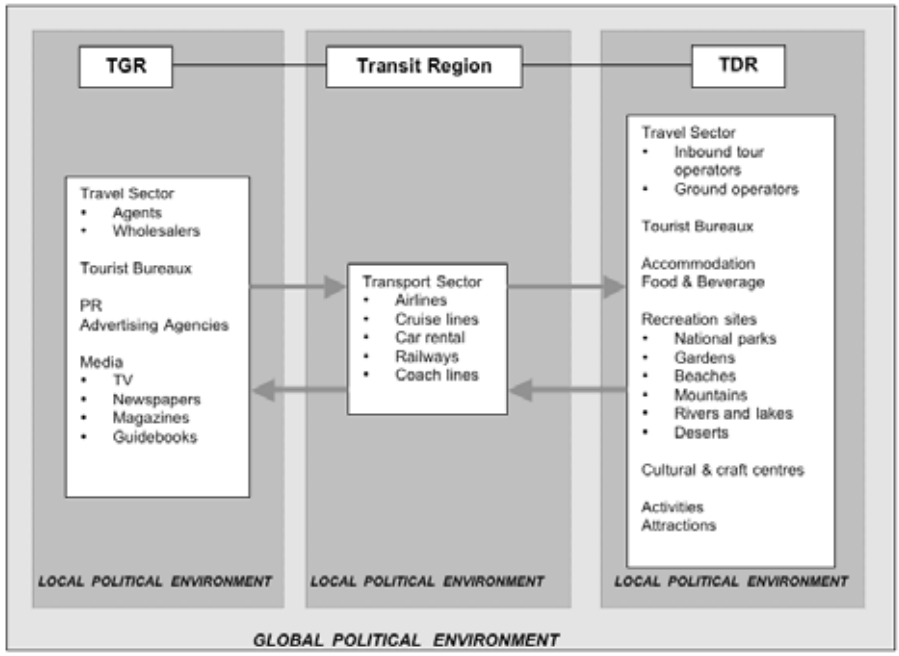
Figure 10.3: Elements of a Tourist System



Source: Leiper (1995)

There are businesses that specialise in servicing each element of the system, from providing information to the customer, through to transporting them to their destination and providing activities, attractions and services. While not all services are solely for tourists (for example, airlines carry freight and non-tourist travellers), most of these listed below are considered to be predominantly in the tourism industry, with many of those in the tourism destination region relating directly to the wildlife tourism sector. Figure 10.4 illustrates the links between the various elements that bring wildlife tourists to a region.

Figure 10.4: Businesses in a tourist system



Source: Sue Beeton

There is a political environment within which all of the elements/businesses operate, which can be different in the generating region, in the destination region, or even the transit regions, particularly when we look at international tourism. The high majority of tourists travelling to developing countries (periphery economies) tend to come from the developed countries (core economies) that often have very different political environments, for example when tourists from a Western democratic environment visit an Asian communist country. Differences in attitudes, beliefs and economic backgrounds can cause friction, such as young people desiring to emulate the lifestyle of the wealthy visitors. In order to better understand and overcome some of the political obstacles, global tourism organisations have been developed, some under the United Nations, such as the World Travel and Tourism Council (WTTC) and World Tourism Organisation (WTO). The World Bank has a division that funds tourism projects in developing countries.

In addition to this, many of the larger companies involved in the tourism industry have become transnational, either through their own expansion or through developing strategic cooperative alliances with similar companies. Examples of the 'big players' in transnational tourism are the hotel chains such as the US-owned ITT Sheraton, Corporation, Holiday Inn, Hyatt Hotels and Resorts, Marriott International and the UK-owned Inter-Continental and Hilton International, and Accor from France; cruise lines such as P&O and Carnival Corporation in the Caribbean (Honey, 1999). Strategic alliances are now common in the airline industry (see the discussion in the Tourism Business Management Theory section earlier in this chapter), while other cooperative alliances incorporate principal-agent links (such as between an airline, hotel, car rental company and travel agency chain, in a 'preferred supplier' agreement) and reservation systems (Leiper, 2003).

The Role of industry associations

According to Leiper (2003: 195), '[a]ssociations of business organisations are a major medium of co-operation at the centre of many industries and there are, perhaps, more in tourism than in other kinds of industries.' Some are globally broad-based tourism groups, such as the WTTC (World Travel and Tourism Council) and PATA (Pacific Asia Travel Association), while others deal with a specific international sector, such as IATA (International Air Transport Association), a grouping of over 100 airlines. Various countries have their own national bodies such as AFTA (Australian Federation of Travel Agents), USTAA (United States Travel Agents Association) and TAAANZ (Travel Agents Association of New Zealand), also niche, product-based associations such as Ecotourism Australia and The International Ecotourism Society. More locally there are state or even ideal-based groups such as the Institute for Peace through Tourism. Those that may relate to wildlife tourism include the aforementioned ecotourism associations, Interpretation Australia, Savannah Guides (for businesses in Northern Australia), the Forest and Bird Society (New Zealand), the Adventure Travel Society (United States), Scotland and Scottish Marine Wildlife Operators Association and Track Care (Western Australia). Wildlife Tourism Australia is a recently-formed association specializing in the sector. Its main aim is to promote the sustainable development of a diverse wildlife tourism industry that supports conservation. There are also zoological organisations and field and game associations around the world (see Chapters Three and Four respectively).

These associations provide services for their members such as lobbying at local, federal and international levels, also education and training opportunities. Associations such as Ecotourism Australia and The International Ecotourism Society have also been involved in developing and maintaining industry standards through introducing and supporting accreditation/certification programs. Some groups have also taken on a stronger development and marketing role due to decreasing (or limited) government support in many countries, particularly when dealing with transnational issues.

Wildlife tourism business development

The broad business context for wildlife tourism has been described in the early part of this chapter, including some theoretical business considerations. Following is an outline of the process that SMWTEs and other tourism businesses must consider in order to develop a viable business enterprise. This is not so much a 'how-to' guide, rather an outline of the elements and strategies that can assist to open up opportunities and sustain a wildlife tourism business. Many are generic business elements and are described in more detail in other texts (see Leiper, 2003; Beeton, 1998; McKercher, 1998; Weaver and Oppermann, 2000; Page et al., 2002; Goeldener et al, 2002 and other general introduction to business management texts as well as many government agencies). However, in the interests of completeness they have been covered briefly.

Taking a great idea and converting it into a business product is not always obvious or easy. As already noted, many wildlife tourism businesses are small to medium enterprises, which means that the owner-manager has a very hands-on approach. Once a potential business operator has concluded that the idea is sound and that there are the necessary people skills required to be involved in a service industry such as wildlife tourism, the practical issues of business structure, identifying the need for the idea/product through planning, and finding ways to finance the operation need to be addressed. While the structure of this chapter suggests an order in which to undertake

this process, often elements of each stage will be occurring concurrently. For example, identifying the need and modifying the idea/product is something that occurs throughout all of the planning process.

Business structures

Many of the current tourism management texts, while expounding various management theories, do not discuss the basic differences between the types of business structure that can be adopted. There seems to be an assumption that certain structures are 'a given' and do not need to be outlined or discussed. The most common business structures for start-up SMWTE tourism operations are sole proprietorships, partnerships or proprietary companies, with less common structures including public companies and trusts (McKercher, 1998). With indigenous communities being linked to (or running) wildlife tourism enterprises, cooperative enterprises that include partners or mentors who plan for their own redundancy are becoming more common. If diversification of an existing business (such as agriculture) into wildlife tourism is involved, a separate business entity may be established. However, where primary producers receive subsidies in areas such as fuel and vehicles, the tourism elements are more often incorporated within the existing business. Business advisors (tax agent, accountant, bank) will be able to advise on that in terms of tax and other financial concerns. The various business structures have different strengths and weaknesses that make each suited to different situations. Table 10.3 has been adapted from numerous sources, including McKercher (1998), MyCorporation Business Services (1999), Australian Taxation Office (ATO) (2003), as well as from direct, personal experience and research.

Table 10.3: Strengths and weaknesses of different business structures

STRENGTHS	WEAKNESSES
Sole Proprietorship	
• Ease of establishment (less start-up paperwork) • Least capital required • All profits to owner • Ability to write off business losses against other income • Maximum personal control	• Narrow management base • Least likelihood of sourcing external capital • Fewest tax advantages • Maximum personal liability
Partnership	
• As for Sole Proprietorship • Opportunities to reduce taxes and split income • Skills of potential partners	• As for Sole Proprietorship • Less flexibility in transferring ownership • Potential problems with partners • Unlimited liability of all partners for the acts of one partner
Proprietary Limited Company	
• Existence of the business as a separate entity • Limited liability of shareholders • Ease in transferring shares • Control of directors' actions • Greater ease in attracting capital	• Operation highly regulated • Constraints on management • High set-up costs • Expensive to organise and manage
Cooperative Enterprise (can be partnership, limited company or not-for-profit)	
• Provides a business skill-base • Fosters community development/empowerment of marginalised individuals and groups • Opportunities to acquire financial support due to inclusion of experienced business partners	• Difficult to establish – long time-frame • Requires clear contractual agreements, especially phasing-out process of business partner • Difficult to obtain financial support • True collaboration/cooperation difficult to achieve
Not-For-Profit Corporation	
• Tax exemptions • Some lower postal rates • Lower rates for membership to other corporations • Employees may qualify for subsidised training and study programs	• Paperwork (articles of incorporation, bylaws, minutes, complex tax forms) • 'Profits' must be fed back into the company, not to officers or staff

Source: McKercher (1998); MyCorporation Business Services (1999), ATO (2003)

Unless operating under the name of the proprietor, the business name needs to be registered. Selecting an appropriate name is important as it is the 'brand', conveying an image and impression to potential customers as well as aligning or differentiating the operation from its competitors. A good business name should be short, easy to spell, convey the main theme of the business and be open enough to allow for expansion (McKercher, 1998). For example, Jane's Wildlife Tours may describe the business as it currently exists, but if Jane sells to Antonio, the name is immediately redundant and the goodwill value of the business plummets. This has happened with many small to medium tourism enterprises where their future possibilities were not considered at the time of establishment, such as sale or expansion. Once a brand and image has been established, it is costly and inadvisable to change it.

Cooperative enterprises with indigenous partners are often set up under a partnership agreement, but they can also be structured as proprietary limited companies or even as a not-for-profit organisation. The partners consist of an experienced external business operator, usually with a Western cultural background, who commits to a reducing interest in the company over a period of time. In this way, the business can attract financial assistance and utilise the expertise of the founding partners, while the indigenous partners learn the appropriate business skills over a period of time. One of the problems with such a structure is determining the phase-out time-frame and making sure that all parties are fully aware of the nature of the agreement, particularly in terms of equity and responsibility. There are some successful ventures using this model, particularly with indigenous communities in developed and developing regions, as it gives them an insight into the Western tourism

structures, which contain the main tourist generating regions. One case is Desert Tracks, a central Australia tourism company now fully owned by its aboriginal partners (CRC Tourism, c.2001)

When choosing a structure, all businesses need to consider factors such as:

- number of people involved in the venture
- risk involved
- taxation considerations
- cost of establishing and continuing the operation
- available finances
- need for capital for establishment of expansion
- desire to admit new partners into the venture
- transferability of interest
- reliability of the partners
- future plans of the proprietors and the business

There are also numerous licensing and statutory requirements that may need to be met by a wildlife tourism enterprise, depending on the activities of the business and local legislation. As well as general regulations regarding name registration, consumer regulations, fire, health and safety regulations, there are some that are specific to wildlife tourism ventures. These may include commercial-passenger vehicle licenses, food and alcohol handling permits, marine-board licenses, fishing and hunting licenses, first-aid certificates, licences to operate on public land, access to restricted areas and so on. In addition, most insurance agencies now insist that all staff demonstrate that they have appropriate skill levels for their work, particularly when dealing with the outdoors and wild animals.

Most businesses require some staff, either on a permanent, part-time or casual basis. Tourism enterprises have often employed 'volunteers', reimbursing them with in-kind goods or just the experience gained by helping out. However, not all enterprises are covered by an appropriate level of insurance or workers compensation. If there is an accident, and anyone working in the business is injured, the cost of not having workers' compensation insurance (apart from being illegal in many countries) will most likely be the loss of the business and personal assets if not a proprietary limited company. Insurance costs can be high, but the consequences of not having it are even higher (Beeton, 2003).

Planning it strategically

Much of the literature on strategic management (for business in general as well as tourism operations) tends to focus on its role in large enterprises, where there is a complex reporting and information structure, handled by numerous managers. However, strategic planning and management is also important for SMWTEs, with the main difference being that it may well be the same person who develops both the strategic plan and the day-to-day operational plan as well as implementing them. So, for smaller businesses, it is more practical to incorporate elements of strategic planning into the operational-based business plan as outlined in the section following this discussion on strategic planning.

There are three 'stages of being' evident in companies, with the first being reactive management where businesses that respond to problems only as they arise, the second being compliance management where businesses have established systems and

programs to comply with legislation and regulation. This second stage is where most tourism businesses tend to be. The final, preferable stage is where businesses manage proactively, attempting to foresee hazards and regulations, working systematically to minimise the effects of their operations on the environment, health and safety of workers, and local community. This final stage is where strategic planning and management sits.

The term 'strategy' was originally a military term related to battle planning. Theorists have taken this term into the business realm, equating the 'battle' with 'competitiveness'. However, as Leiper (2003: 181) argues, '[i]n order for a business organisation to achieve its goals, it must fulfil its purpose, … therefore [they] … are about achieving the purpose of each organisation which is not beating the competitors but satisfying the customers.' As already noted, the tourism industry is peppered with cooperative arrangements, formal and informal, from airline alliances through to cooperative regional marketing, private-public partnerships and industry associations. Consequently, the term 'strategic' has come to reflect flexible planning more than outright competition, especially in relation to tourism. Strategic planning also refers to longer-term plans of 3-5 years (or over 10 years in some cultures), while shorter-term plans to achieve the strategic goals are referred to as operational or tactical (retaining the battle rhetoric).

Strategic plans contain overall goals of an organisation, such as what type of business to be involved in, the market segments to pursue and type of products to develop (Moutinho, 2000). As strategic planning is forward-looking, and circumstances may change suddenly due to outside influences such as natural and political disasters, a static five-year plan may soon be redundant, however if such plans are flexible ('strategic') they can be developed to respond to sudden unexpected shocks while retaining overall company goals and standards. Table 10.4 outlines the basic differences between strategic and operational planning.

Table 10.4: Comparison of strategic and operational planning

	Strategic planning	**Operational planning**
Duration	Long term (>3 years)	Short term (<3 years)
Done by	Senior management; Top marketing management; SMTE Proprietor	Marketing & product managers; Middle management; SMTE Proprietor
Necessary information	Primarily external information	Primarily information from within the organisation
Degree of detail	Broad in nature; Subjectively based	Detailed information & analysis; Objectively based

Adapted from Moutinho (2000)

There are three basic steps involved in strategic planning and management, namely strategy formulation, strategy implementation, and evaluation and control. Strategic management is an ongoing, fluid process consisting of a series of decisions with some consistency between them, based on the organisation's goals. Further information on strategic planning and management in tourism can be found in Moutinho (2000) and Leiper (2003).

Business planning

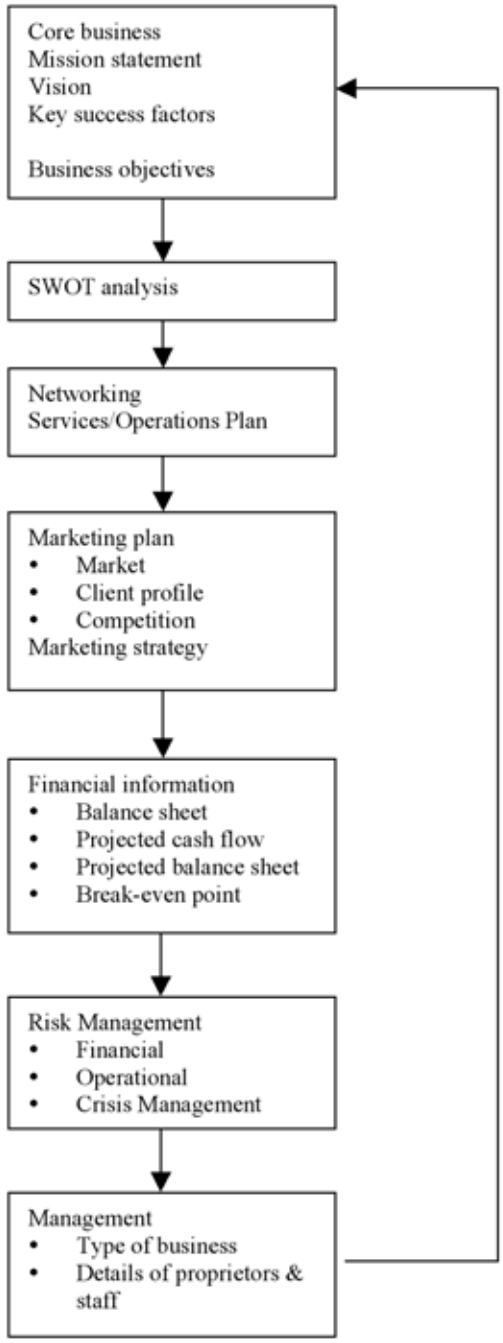
In a study of kangaroo tourism operations, Higginbottom et al. (2003) found that the most successful businesses had documented business plans, and while some were only a few pages long, they were adequate for small businesses operations. They also noted weaknesses of the not-so-successful operations were based around their approaches to business planning, such as not articulating any planning, and keeping it in the proprietor's head. The benefits of articulating a business plan for SMWTEs are:

- manager is reminded precisely of the plan's contents, which is a useful process over the time span covered by any business plan
- other employees can see exactly what the plan comprises – useful for encouraging teamwork in business management
- various users of the plan (members of the management team) can see exactly how the items in the plan are linked together and connected to other aspects of the organisation and its environments
- documented plan is useful in commercial dealings with bankers and other external stakeholders

(Higginbottom et al., 2003: 52)

There has been little examination of business planning for wildlife tourism enterprises, however much of the work on ecotourism can be applied. Weaver (2001) compares four guides to ecotourism business planning (Patterson, 1997, cited Weaver, 2001; McKercher 1998, cited Weaver, 2001; Beeton, 1998, cited Weaver, 2001; Tourism Queensland, 1999, cited Weaver, 2001), concluding that they all contained the same elements, with some variations in their order. The elements of a basic business plan outline are listed in Figure 10.5.

Figure 10.5: Outline of a tourism business plan



Financial planning

Financial planning and analysis is a crucial element of any business – without some concept of costs and break-even levels, the rest of the planning process is irrelevant. As noted in the business plan outline above, balance sheets, projected cash flows, projected balance sheets and break even points are the absolute minimum that is required for any successful wildlife tourism business. Such reporting is required from public companies, and is often requested by sponsors and other funding groups as well as traditional financing sources such as banks.

While accounting practices are similar around the world, local taxation laws and other government regulations may require a different accounting treatment. Many government departments have excellent small business advisory centres that can assist in this area, and some banks also provide these services to their customers (McKercher, 1998; Weaver, 2001). Nevertheless, costing and pricing skills are essential and can be quite specific from a wildlife tourism aspect, so they are covered in more detail below.

Costing and pricing

All tourism businesses must be profitable and able to pay commissions, while at the same time considered by the customer to be value for money. The interrelationship of these three elements is delicate – if it gets out of balance, the business will suffer. Many nature-based (including wildlife) tourism products have been traditionally under-priced in countries such as Australia, where the domestic market was believed to be highly price-sensitive. However, if tourism operators do not challenge the market by pricing their product so that it provides a reasonable income, the industry as a whole suffers (Kotler et al., 2003; Beeton, 1998; 2002). Anecdotal experience has demonstrated that the market is not as price-sensitive as some operators fear. It has been suggested that the operators are putting their personal pricing perceptions of what they would be prepared to pay onto their product rather than the customer, who may be prepared to pay more (McKercher, 1998; Beeton, 2002). Research by Lawson et al. (1995) into what people were prepared to pay found that the actual price of tourism activities was generally unimportant in their decision to participate, as long as they felt they were getting value for money.

Therefore, the elements to be taken into account when costing a wildlife tourism product must be adequately researched and understood. They include:

- Basic/fixed costs
- Desired returns
- Competitors prices (and levels of quality)
- What the market will bear (understand the nature of that market)
- Commissions to agents (compared with other marketing costs)
- Position of product in the marketplace (eg. Exclusive, budget, youth etc.)

Pricing is not an exact science, and there are numerous ways that it can be approached. Nevertheless, many SMWTEs fail by not structuring their pricing to include commissions, as well as neglecting to consider the personal income needs of the business proprietors and provide a buffer for the low season. As noted in the list above, decisions about what to charge for a wildlife product will also depend upon the target market. Basically, there are three broad pricing strategies that can be applied:

- Premium pricing that sets prices that above the existing market price in order to position the product as unique or high quality;

- Value-for-money pricing that provides an experience that is commensurate with the price charged;
- Cheap pricing that uses low prices without any pretence of quality. (McKercher, 1998)

Packaging

Packaging is an integral aspect of tourism, particularly (but not exclusively) for SMWTEs. Simply put, two or more items are brought together into a package that has an all-inclusive price. For example, a hunting trip may include transport from a major city and accommodation before and after the hunt. That package itself may then be added into another package that takes in the whole country and includes elements of hunting and wildlife viewing with city experiences and so on.

Package tours used to be the territory of mass tourism, where they were inflexible, yet offered a cost-effective and easy way for inexperienced travellers to get a 'taste' of a place. With the increase in independent travel over the past twenty years, packages have had to become more flexible and varied. By packaging an existing product with other goods and services, a new product can be created, often for a new market. Table 10.5 outlines the benefits of packaging to the tour operator and tourist, which relates particularly to wildlife tourism.

Table 10.5: Benefits of tour packages

FOR THE WILDLIFE TOURISM ENTERPRISE	FOR THE TOURIST
Access to new markets	More economic to purchase than each item individually
Increased marketing opportunities through the other products in the package	Find a new product more suited to their needs
Leverage the reputation of wholesaler (eg Contiki – youth, adventure; Abercrombie and Kent – high quality, upmarket)	Recognised branding assists in product choice Reduces perceived risks of travel
Get a product targeted to a specific market	Consistent quality of experience
Access to the Distribution Network - travel trade more interested in selling it	Cost-effective
Cost savings	Provides opportunities for new experiences
Aids in business growth	
Easier to sell, as it's easier for customers to purchase	Easier to purchase than each item individually
Able to tap in to others' expertise (including promotion)	

Adapted from McKercher (1998)

The most significant benefit of packaging for wildlife tourism operations is the ability to be able to increase the reach of the product through the marketing and distribution channels that packaging opens up. Also, for places that are difficult to get to without personal transport, packaging with a tour operator or transport company opens up a whole new market, particularly in terms of international visitors.

Best practice in the business of wildlife tourism

What is 'best practice'? In order to identify best practice in wildlife tourism businesses, it is necessary to address issue of sustainability, from the financial, environmental and cultural (social) aspects. As Higginbottom et al. (2003) found, this is not a simple process, as many wildlife tourism businesses may be exemplary in one element, but not in others. Also, the diversity of business structures and activities makes finding a single case of 'best practice' impossible. Various accreditation/certification programs are struggling with this concept and many have introduced a range of standards for specific products within a business as well as the

overall business itself. Some of the more developed programs include those under the Green Globe banner, Ecotourism Australia's NEAP (National Ecotourism Accreditation Program), the Victorian-based Tourism Accreditation program and Costa Rica's Greenleaf certification.

A concept that has gained currency in tourism over the past few years, informing and transforming numerous corporate reporting strategies (see Tourism Victoria, 2002), is *Triple Bottom Line* (TBL). Originally coined by John Elkington (1997), the concept maintains that there are three prongs of business, namely Social, Environmental and Financial. TBL enables others, as well as the business itself, to assess how sustainable an organisation's or community's operations are, assisting to establish greater public accountability. It directly links with the concepts and goals of sustainable tourism development and takes a long-term view, often not adopted by governments or even some businesses.

The integrated nature of TBL accounting and reporting implies that all three elements are incorporated into a single, all-encompassing measurement. The main challenge of TBL reporting is to quantify all of the 'costs', and while there is no single currency into which value-adding or destruction in any of the dimensions can be assessed, there are some instances outside of the tourism industry. For example, the Index of Sustainable Economic Welfare has been developed in the US (Elkington, 1997) which adjusts normal levels of welfare by subtracting costs associated with unemployment, commuting, auto accidents and environmental pollution. In order to measure the various elements within TBL, different indicators need to be assessed in different ways, qualitative as well as quantitative.

In effect, Triple Bottom Line reporting insists that management and business owners consider their long-term attitudes towards environment, social & economic development. While some government tourism departments, such as Tourism Victoria are now referring to TBL reporting, it is too soon to assess their commitment to the concept.

Conclusion: the way forward

In summary, wildlife tourism enterprises need to be sustainable, financially viable, accessible to their markets, and managed in a strategic, flexible and proactive manner. There are many areas that require a more comprehensive understanding from operators, planners, government departments and researchers alike. Much can be learnt from general business management theory as well as from tourism operations.

This chapter has touched on the most relevant business management theories, applying them to wildlife tourism businesses. There has been a strong focus on smaller business operations, which form the majority of wildlife tourism enterprises, however the theories and philosophies can be applied to most businesses regardless of their size. The challenge for managers is to recognise the relationship between theory and practice and not be daunted by some theoretical terminology. In the end, the theories discussed were developed from studying actual businesses and offer a great deal of insight into wildlife tourism operations.

In relation to understanding the wildlife tourism industry further, the roles of packaging, pricing and marketing in particular need to be more thoroughly understood by all parties involved in the industry. There are numerous studies as well as anecdotal evidence that underline the significance of pricing and packaging, in particular for a product such as wildlife tourism that will often be one component of a multi-faceted

experience for most tourists. For example, Higginbottom and Buckley (2003) reported that wildlife operators involved in kangaroo viewing do not use persuasive marketing to its best advantage.

Whether starting up or expanding an existing business into wildlife tourism, adequate business planning as well as an understanding of many of the other issues discussed in this book (such as marketing and sustainability) must all be considered. If not, the results may be an environmentally, economically and socially unsustainable wildlife tourism industry.

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Chapter 11

Managing Impacts of Wildlife Tourism on Wildlife

Karen Higginbottom

Introduction

Wildlife tourism can have negative impacts (Chapters 2, 3, 4 and 5) or positive impacts (Chapter 6) on animals that are the subject of, or otherwise affected by, such activities. It is vital to the ecological and economic sustainability of wildlife tourism that wildlife populations – the resources on which businesses depend – are not damaged, and it is desirable that their conservation or welfare be enhanced. Management regimes that facilitate this are critical from environmental and industry perspectives.

While the literature on management of nature-based recreation is substantial, efforts to understand and manage impacts associated with wildlife tourism are relatively new (e.g. Green and Higginbottom, 2001; Higginbottom et al., 2001a; 2003; Vaske et al., 1995; Manfredo, 2002). This chapter describes a framework for managing wildlife tourism that minimises the costs to wildlife and, where applicable, maximises net benefits. While most of the chapter focusses on viewing of free-ranging animals (wildlife watching), many of the issues are equally applicable to viewing animals in captivity and to hunting tourism. The latter two are, however, covered in more detail in Chapters 3 and 4 respectively. Some of the management challenges that are particularly applicable to marine wildlife watching are explored further in Chapter 2. Much of the information in this chapter is drawn from Higginbottom et al. (2001a; 2001b), Green and Higginbottom (2001), Higginbottom et al. (2003) and Manfredo (2002). These sources can be consulted for more details. Nearly all of the literature on management of tourism impacts on wildlife deals with ameliorating negative impacts, and so that is the emphasis of this chapter. Some management actions or directions that may help enhance benefits of wildlife tourism in terms of conservation of wildlife are explored further in Chapters 3 and 6.

Management of wildlife tourism will be most effective if it is applied across the system including wildlife species, natural areas where visited populations occur (e.g. National Parks), wildlife viewing sites within a protected area and individual tourism operations.

At international, national and regional scales, legislation, policy and various written (educational) guidelines are the principal tools used to manage impacts of tourism and other activities on wildlife. Most countries have legislation to 'protect' wildlife, which generally prohibits collecting, injuring, killing and sometimes handling, except under certain specified conditions. Species that are listed as protected vary between jurisdictions but typically include most native mammals and birds. To varying extents, countries also usually have policies and legislation relating to animal welfare. In Australia, for example, these apply to all terrestrial vertebrate animals, whether protected or not. Zoos are usually subject to government regulation, often supported by requirements for licensing and written standards relating to species exhibits and management (Cooper, 2003; see also Chapter 3). Hunting is also usually

regulated, at least in more developed countries (see Chapter 4). In addition, governments often have policies or pieces of legislation that relate to specific issues encountered in wildlife tourism such as supplementary feeding or visitor interaction with particular species. Some industry organisations also have policies or codes of conduct that influence management practices. Prominently, as part of the wildlife tourism continuum, the World Association of Zoos and Aquariums has developed a Code of Ethics to which all its members are expected to adhere (Stevens and McAlister, 2003). Various international initiatives and organisations involved in ecotourism (most notably The International Ecotourism Society) are also influential in developing guidelines for operators and for tourists.

For organisations that either operate or are legally responsible for the management of wildlife tourism activities at more localised scales, particularly at the level of individual viewing sites or protected areas, a wide range of additional management tools is available. These are the principal focus of this chapter, although the elements of the framework proposed can be applied on any scale. Since each wildlife species and wildlife tourism situation is associated with different types of impacts and management opportunities, it is not possible to apply any fixed management formula. In this chapter, however, we provide some guidelines that should help operators and managers to devise the management regime that best suits their circumstances. An effective approach to management requires a suitable overall management-framework (process), as well as an appropriate approach to each of the elements of which it is comprised. This chapter addresses each of these elements in turn.

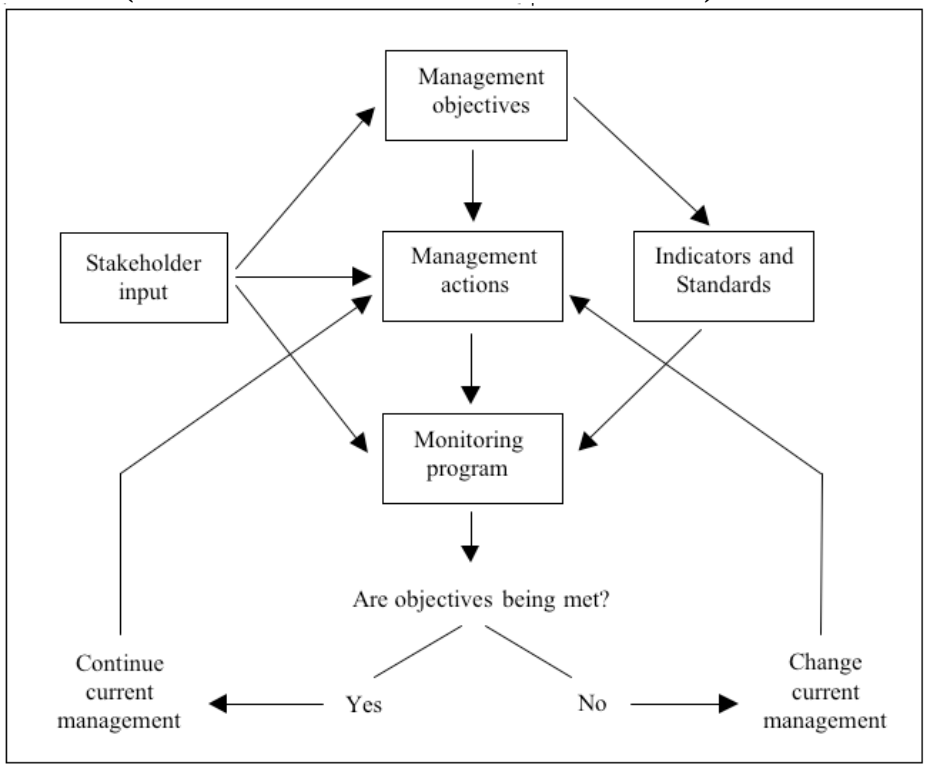
Management framework

Various frameworks or models have been designed for planning or managing environmental impacts of nature-based recreation that may be appropriate for management of wildlife tourism (especially Recreation Opportunity Spectrum (Clark and Stankey, 1979), Limits of Acceptable Change (Stankey et al., 1985), Visitor Impact Management (Graefe et al., 1990), Visitor Experience and Resource Protection (US Department of Interior, National Park Service, 1997), Carrying Capacity Assessment Process (Shelby and Heberlein, 1986), Tourism Optimisation Management Model (Manidis Roberts Consultants, 1997), Experience-based Management (Manfredo et al., 2002)).

Most of these models have several key elements in common that are central to the design of an effective management program (illustrated in Figure 11.1).

i. Clearly stated and agreed management **objectives**, usually linked to broader **goals**, and including a statement about desired status of the wildlife and habitat
ii. **Indicators** and **standards** that specify when the objectives are considered to have been achieved
iii. Appropriate choice and implementation of **management actions** designed to meet these objectives
iv. A suitable **monitoring** program, with an effective mechanism for feedback from evaluation of monitoring into management actions
v. An adequate process for **stakeholder participation** at all key stages of the management process (covered in Chapter 7)
vi. A clearly documented **process** that brings the above elements together in a cyclical fashion and guides ongoing management

Figure 11.1: Broad framework for managing negative impacts of wildlife tourism on wildlife (modified and extended from Hammitt & Cole 1987)



Although such systems have been developed principally for protected-area management agencies, the broad principles are also applicable to private, government or NGO operators of wildlife tours or attractions, including zoos. They are also equally applicable to all forms of wildlife tourism or wildlife-related recreation involving free-ranging animals. Private operators could incorporate these elements into their business plans. Clearly, government organisations are under a greater obligation than private operators to incorporate public participation, yet even the latter may be well advised to engage key stakeholders in their planning and management processes if decisions are potentially controversial.

Although the focus of this chapter is impacts on wildlife, sustainable management of wildlife tourism usually requires simultaneous consideration of impacts on visitors, host communities and (if tourism businesses are involved) financial success of operators. The relative emphasis an organisation places on each of these aspects and the goals identified for the program are likely to depend on the type of organisation. For example, tourism operators and recreation managers trained in a 'service philosophy' are likely to place more emphasis on meeting the needs and aspirations of visitors than are protected area managers or conservation NGOs with a primarily environmental orientation. Consequently, although this chapter deals with managing the impacts of wildlife tourism on wildlife, it should be borne in mind that other impacts should ideally be simultaneously addressed as part of the same framework (see Chapter 13 and Decker et al., 2001).

Goals and objectives

A goal may be seen as a vision of what is planned or as a statement of desired future conditions. Goals are generally qualitative and abstract. They are influenced by the values and norms of the society and organisation in question, and will generally be linked to the overall mission statement of the organisation. However it is often worth considering the assumptions and values that might underlie any identified goals, and whether they adequately reflect available knowledge and incorporate the views of relevant stakeholders (see Chapter 7).

Goals relating to impacts on wildlife can be particularly controversial. Traditional training of environmental and wildlife managers often tends to promote an 'impact-intolerance rule', wherein wildlife watching must not interfere appreciably with the 'natural' conditions of wildlife (Manfredo, 2002). This view is generally inconsistent with use of management tools such as supplementary feeding or habitat manipulation that may be used to enhance wildlife-watching experiences. The view that tourism should not be allowed to cause any changes to wildlife populations typically seems to be associated with (i) an ecosystem understanding of natural systems, which implies that any change in one element of the ecosystem is likely to affect other elements; (ii) the difficulty of understanding or predicting the effects of manipulating any element of the system, combined with application of the 'precautionary principle' (Hare et al., 1990). This principle states that in the absence of clear evidence about ecological sustainability of a development, 'policy decisions should err on the side of caution'. To some extent it may also follow from an ethical stance that proclaims that humans should not interfere with nature. This philosophy contrasts with that often applied to the management of hunting, in which manipulations of population sizes and habitats are seen as legitimate management tools, as long as target populations are maintained at sustainable levels. Some argue that a 'hands off' approach ignores the dramatic effects that other forms of human development have had on animal populations and the conservation benefits that can accrue to wildlife through involvement in tourism (Chapter 6), and that it fails to consider what negative impacts likely alternative land-uses may have on wildlife. 'Experience-based management' (Manfredo, 2002; Gill, 2002) presents one compromise view, which treats visitor satisfaction as the primary goal of wildlife watching, with adequate wildlife protection as a constraint, and preferably as an additional benefit.

It is not our role to judge the merit of these different ethical approaches. Our point is that each organisation should explicitly consider its priorities, values and assumptions – as well as those of any key stakeholders – in developing its goals.

Objectives are more concrete statements about intent that flow from goals. They should be quantifiable or discrete, bounded in space and time, and realistic. They should be outcome-oriented – focusing on what management intends to achieve and not on how this is to be done (Fulton et al., 2002). In the case of managing impacts of wildlife tourism on wildlife, objectives should ideally specify the acceptable levels of relevant negative (or positive) impacts on wildlife and habitats.

As part of this process of determining goals and objectives, it is important to recognize that wildlife tourism can simultaneously lead to positive, neutral or negative outcomes in the following areas:

- sustainability of wildlife populations as a direct result of the wildlife encounters (ultimately, negative impacts are declines in population size(s) over time)

- sustainability of wildlife populations (perhaps including those that are not part of the tourism experience) as a result of other aspects of wildlife tourism (e.g. positive changes may result from visitor education, or enhanced revenue for conservation)
- welfare of individual animals
- ethical issues e.g. treating animals without due 'respect'

Awareness of these issues allows the relevant outcomes to be made explicit in the goals, and consideration to be given to the fact that negative outcomes in one aspect may be offset by positive outcomes in another. Thus, for example, it may be considered that a certain level of disturbance to animal populations at one site is acceptable if wildlife tourism allows maintenance or acquisition of habitat for other populations.

Indicators and standards

As part of, or in addition to objectives, most current models for planning or managing environmental impacts of nature-based recreation recommend that quantifiable indicators and standards be identified. Indicators are variables that are considered to reflect the condition of specified components of the system under management and can be physically measured. Standards specify ranges or set boundaries for conditions or values that are considered to be acceptable. They state in unambiguous terms what outputs management is aimed at providing. Monitoring can then be used to assess whether standards are being met.

Two recommended approaches to specifying standards are (i) 'limits of acceptable change' (LAC) (Stankey et al., 1985) and (ii) optimal conditions for components of the wildlife tourism system and then an acceptable range within which indicators for each component must fall (McArthur, 2000).

Since it is never possible to measure all potential impacts on all species, a critical choice is which species and attributes of those species to monitor – in other words, which indicators to use. Ultimately, conservation-oriented management aims to ensure that populations of the various species do not decline in size over time as a result of tourism activities (Gill et al., 1996), which in turn may affect the structure of the animal community and ecosystem. However, impacts of recreation on wildlife can occur at a hierarchy of levels, from individual animals through to populations and communities (Knight and Cole, 1995), with effects at a lower level sometimes providing useful indicators of those at higher levels (see Chapter 5). Similarly, although the species selected for monitoring will often be those that are the object of tourism, in some cases adverse impacts may be more pronounced for species that interact with it as competitors, predators or prey.

Common indicators for the impacts of wildlife tourism on wildlife include species presence/absence, abundance, diversity, breeding success, behaviour or health; or attributes of the habitat (see Higginbottom et al., 2003 for an assessment of these). Indicators are likely to be most useful if they (i) are directly related to management objectives, (ii) reflect the components expected to be most negatively affected by tourism, (iii) allow early detection of impacts, (iv) are amenable to management, (v) can be measured accurately, and (vi) are affordable in terms of cost – money and labour (Vaske et al., 1995; Manidis Roberts Consultants, 1997). If the indicators are measured at the level of individual animals (e.g., behavioural changes) it is also

desirable that a relationship has been established between these changes and those that have a detrimental effect on populations. Unfortunately, some of these criteria are difficult to assess or implement due to lack of sufficient knowledge and/or technique development: these remain important topics for research (see Chapter 5). In cases where the relationship between tourism variables and impacts is fairly well understood, it may often be easier to use as indicators variables that are known to have impacts on wildlife (e.g. amount of noise made by tourists, or degree of soil compaction), or perhaps use these to supplement the wildlife indicators (as in Table 11.1). In addition, it is generally advisable to monitor characteristics of visitors (e.g. numbers, activities, distribution) so that variation in wildlife variables can be related to any variation in visitor variables (also exemplified in Table 11.1). Kangaroo Island is an increasingly popular destination for wildlife watching and other nature-related tourism activities. Objectives that are directly relevant to wildlife issues are given below.

Table 11.1: Wildlife-related objectives, indicators and standards for Tourism Optimisation Management Model (TOMM) on Kangaroo Island, Australia.

Optimal Condition (objective)	Indicator	Acceptable Range
Major wildlife populations attracting visitors are maintained and/or improved in areas where tourism activity occurs.	Number of sea lions at Seal Bay and seals at Cape De Couedic. Number of hooded plover at designated tourist site (one only). Number of osprey at designated tourist site (one only).	0-5% annual increases in number sighted.
Ecological processes are maintained or improved in areas where tourism activity occurs	Net overall cover of native vegetation at specified sites.	0-5% increase in native vegetation base case
The majority of the number of visitors to the island's natural areas occurs in visitor service zones.	Proportion of KI visitors to the island's natural areas who visit areas zoned specially for managing visitors.	85-100% of visitors.

Source (McArthur (2000) supplemented by F. Vickery, pers. comm.)

In another example, impact indicators and standards proposed for specialised backcountry elk viewing included: no more than 4 visitor groups per day, less than 4 people per group, no incidents demonstrating disturbance to elk and wildlife flight distance no more than 200 feet (Vaske et al., 2002).

While indicators and standards in relation to wildlife impacts generally relate to potential negative impacts of tourism on wildlife, there is no reason why these cannot also be used in relation to desired positive impacts. In this case, standards would generally specify the minimum, rather than the maximum acceptable condition (e.g. 'at least $5,000 obtained in donations to conservation fund' or 'more than 80% of visitors participate in conservation education program'). We are not aware of any examples where indicators and standards have been used in relation to positive outcomes for wildlife, but recommend these be included where appropriate.

Management actions

Wildlife tourism operators and protected-area managers often see management actions as comprising the full scope of management, and devise actions as the first step in planning. However, management actions should be designed to facilitate achievement of the designated standards that in turn support achievement of identified objectives. Choice of appropriate management actions involves two inter-related considerations: what to manage, and what techniques or approaches to employ (how to manage). The

most appropriate management actions will depend on the particular circumstances applying to the species, activity and site in question.

In deciding what should be the object of management, the manager needs to simultaneously identify which elements of the system are most closely associated with the level of negative (or positive) impact, and which elements can be most readily manipulated in the prevailing circumstances. In most cases, where the goal of management is to minimise negative impacts, or maximise net positive impacts of tourism on wildlife, it is most effective to target management primarily at the people (visitors and/or operators) who are potentially creating impacts, rather than the wildlife that is the focus of the visitor experience.

Table 11.2 lists the major elements that can be addressed through management and provides information to help the manager determine what might be most effective in the situation in question. In general, management to mitigate the negative impacts of a causal agent of disturbance involves manipulating one or more of the characteristics of the causal agent (Hulsman, 2003). Wildlife tourism activities and infrastructure should be carefully and creatively designed to incorporate features that will minimise negative impacts. Where it is expected that high numbers of visitors in the vicinity of wildlife may cause a problem, measures to manage their numbers, spatial distribution and location (in relation to the animals) and/or temporal distribution should be implemented. Where certain aspects of visitor behaviour may lead to detrimental impacts, measures to modify their behaviour – either directly or through modifying their expectations and attitudes – should be used. Management to enhance conservation benefits of wildlife tourism will most often focus on the attitudes and behaviour of operators and visitors, and may also include consideration of how to expose maximum numbers of visitors to education messages.

In deciding how to manage the impacts of wildlife tourism on wildlife, a variety of different approaches can be used to manage visitors and operators, most of which influence their motivation and consequently (in principle) their behaviour (detailed in Table 11.3). Detailed coverage of the use of economic instruments is given in Chapter 8, and of the use of interpretation to support management in Chapter 12. Research on visitor responses to management strategies designed to modify certain aspects of visitor behaviour is reviewed in Chapter 9.

In assessing and comparing potential management actions, the operator or manager should compare:

- effectiveness (probability of achieving the objectives)
- compatibility with other management objectives (those not related to impacts on wildlife, especially regarding visitors' sense of freedom and satisfaction with viewing experiences)
- the magnitude of negative impacts on wildlife that is considered acceptable
- acceptability to stakeholders
- availability of required labour and expertise
- financial and legal constraints

(See also Vaske et al., 1995; Whittaker et al., 2002).

Table 11.2: Components of the wildlife tourism system that can be managed in order to influence impacts on wildlife.

Object of management	Example	Advantages/ Applications	Constraints/ Disadvantages
Visitors			
Numbers	• Mon Repos turtle rookery (Australia) allows a maximum of 300 visitors in the colony at one time (before midnight) and a maximum group size of 70 near each turtle.	• Simple to apply. • Effective for minimizing negative impacts where there is a strong relationship between visitor numbers and impacts. • If aim is to maximise conservation-related education opportunities, then increasing visitor numbers may maximise such benefits.	• Carrying capacity difficult to determine and varies over time. • Needs to be determined separately for each site. • Often there is only a weak relationship between visitor numbers and environmental impacts.
Spatial distribution in relation to animal distribution	• Managers of Amboseli Game Park (Kenya) in the late 1970s deliberately encouraged greater dispersion of visitors within the Park to reduce impacts on wildlife and habitats.	• In cases where dispersion reduces impacts to negligible levels, dispersion may be desirable. • In cases where even low levels of tourism activity are likely to cause signification harm, concertrating tourism on less vulnerable populations and habitats may be desirable. • Concentrating tourism in areas facilitates intensive management.	• Whether dispersion or concentration is best will depend on the specific situation and may be difficult to determine. • Concentrating use may require considerable investment in infrastructure.
Distance from animals	• Minimum approach distances specified at Denali National Park (USA) are: grizzly bears 0.25 miles, wolves 150 ft, raptor dens 100 yards.	• Simple to apply by managers and visitors. • In general, wildlife disturbance levels are correlated with approach distance.	• Difficult to monitor compliance unless staff always present. • Difficult to establish appropriate distance. • Factors other than distance determine animal response.
Temporal distribution	• The area around wolf dens at Yellowstone National Park (USA) is closed during the spring denning season.	• For species with life cycle stages (e.g. breeding season) when they are particularly vulnerable to disturbance, tourist activity may need to be reduced at those times.	• May require good knowledge of species' ecology and response to disturbance. • Times when wildlife are most sensitive to disturbance are often most desirable times for viewing.
Behaviour during tourism experience	• At Tangalooma Resort (Australia), visitors are instructed to spread out in a line in order to reduce the incidence of 'pushy' responses by dolphins.	• It is advisable in most cases to minimise those visitor behaviours that are likely to be most disturbing to wildlife.	• May require good knowledge of species' response to visitor behaviour.
Expectations or attitudes in relation to tourism experience	• Visitors in Australia often have expectations of being able to feed or handle wildlife. One operator of wildlife tours stated that although participants in these tours are sometimes initially disappointed when they discover they will not be allowed to handle koalas, this disappointment dissipates when the rationale is explained.	• In cases where visitors have expectations or attitudes that are likely to lead to behaviours that will be detrimental to wildlife, management should aim to alter these.	• Requires cooperation from the tourism industry. • Promoting wildlife tourism products while not unduly raising expectations can be a difficult balance to strike.
Contributions to conservation as part of the tourism experience	• The Earthwatch program provides thousands of paying volunteers per year to work on conservation projects, including many on wildlife.	• Many opportunities exist for tourists to contribute to conservation (see Chapter 6). • Wildlife tourism visitors often have an interest and concern for wildlife, and are motivated to contribute in some way.	• Unskilled visitors may not be suited to some conservation work. • See also Chapter 6.
Attitudes and behaviour in relation to conservation after tourism experience	• Sea turtle viewing tourism at Mon Repos Turtle Rookery (Australia), with its associated interpretation, has been shown to result in attitudes indicating increased support for turtle conservation.	• Interpretation relating to conservation may also enhance the visitor experience.	• Little evidence available that wildlife tourism leads to changes in long-term attitudes or conservation-related behaviour (though it may do), or what determines effectiveness.

Object of management	Example	Advantages/ Applications	Constraints/ Disadvantages
Operators			
Design of experience	• Remote viewing using cameras has been used to allow close-up viewing with minimal disturbance for bears and birds (USA). • In zoos, naturalistic enclosures and behavioural enrichment are increasingly being used for animal welfare reasons (and visitor satisfaction).	• Wherever possible, experiences should be designed in such a way as to minimise negative impacts.	• May require detailed knowledge of species' behaviour and response to various design features.
Contributions to conservation	• Earth Sanctuaries Ltd (Australia) are involved in reintroductions of endangered fauna, funded partially by income from tourism.	• Many opportunities exist for operators to contribute to conservation (see Chapter 6). • Many wildlife tourism operators are motivated partly by a genuine interest and concern for wildlife.	• In general, the incentives for operators to be involved in conservation are weak. • May conflict with profit imperative for operators.
Wildlife			
Behaviour/ physiology	• The extent to which koalas become stressed by handling can be reduced through conditioning (Australia).	See Table 11.3	
Location	• In principle, some animals could be translocated away from areas of high tourism impact.		
Habitat			
Habitat protection	• Income from wildlife tourism provided the financial means for an estimated 48% of private game reserves in Kwazulu-Natal (South Africa) to be destocked of cattle.		
Resource availability	• Supplementary food is provided during periods of harsh weather to encourage elk and bald eagles to congregate for wildlife watching (USA).		
Physical environment	• Physical infrastructure such as boardwalks and viewing platforms are often used to limit the susceptibility of the natural environment to disturbance (known as 'hardening').		
Environmental damage	• Habitat that is subject to ongoing damage by visitors can be continually restored.		
Wildlife refuges	• It has been proposed that if the targeted wildlife population occurs in a restricted area of quality habitat, it might be appropriate to restore habitat elsewhere as a refuge.		

Adapted from Higginbottom et al. (2003). Examples are drawn from Green and Higginbottom (2001), Manfredo (2002), Richie Oberbillig (2000) and Shackley (2001); see these references for further examples.

Effectiveness in turn depends on a range of factors including levels of visitor understanding and concern about impacts, availability of scientific knowledge and spatial scale. Often trade-offs are required between such criteria (Whittaker et al., 2002). Unfortunately, factors that determine the effectiveness of the various management actions are mostly complex and poorly understood, so it can be difficult to predict this in advance (ibid.). This is an important area for rigorous research. In terms of management actions that focus on the wildlife, the better the understanding of the behaviour and ecology of the species in question, the more likely it is that managers can devise management actions that will be effective.

Conflicts with objectives relating to visitor satisfaction can be a critical and difficult issue in deciding on appropriate management actions. Common tradeoffs are likely to occur between maintaining low visitor densities and providing ready access by the public to wildlife; between low disturbance levels to wildlife and close proximity between visitors and wildlife, and between providing 'natural' experiences

and a strong 'managerial footprint'. Provision of platforms or hides in order to minimise wildlife disturbance, for example, may reduce enjoyment for experienced wildlife viewers who seek a 'natural' experience away from other visitors and that maintains a 'challenge' component (Whittaker et al., 2002). If such viewers are expected to comprise a large proportion of visitors, then alternative methods that are less intrusive to visitors may be more appropriate (see example on viewing of brown bears at McNeil River, Box 11.1).

Table 11.3: Alternative approaches to managing the impacts of wildlife tourism on wildlife

Object of management	Example	Uses/ Advantages	Constraints/ Disadvantages	Evaluation of current application of method in Australia
Visitors and/or Operators				
External regulation (by government)	• In Australia it is illegal for vessels to approach whales or dolphins to less than 100m. • Fishing prohibitions on river segments near bear-viewing locations at Alaska's McNeil River (USA) to prevent bear-attraction problems. • Regulation of approach distances, and less often of activities that can occur within certain distance zones, are widespread: for bald eagles (USA) certain restrictions on human behaviour apply within 200m of active nests, and stricter restrictions within 100m.	• Most cost effective mechanism in many cases. • Species that are threatened or considered particularly sensitive to tourism impacts should be precluded by law from tourism involving wild populations unless it can be demonstrated that negative impacts would be negligible. • Introduce in initial development stages where possible to avoid negative public reaction. • Restrictions on visitor behaviour more likely to succeed if visitors understand and support the need for them. • Fundamental criteria for treatment of animals (e.g. killing, handling, holding in captivity) need to be regulated to avoid abuse. • Recreational hunting and fishing often need careful regulation to avoid overexploitation.	• Many cases where tourists or operators do not comply with regulations. • Requires adequate resourcing and political will for enforcement. • Restrictions on visitors may reduce visitor enjoyment in some situations, such as when close encounters with wildlife are prohibited. • If introduced reactively, restrictions may conflict with established patterns of visitor use, making them less likely to be effective. Therefore avoid where other approaches will lead to adequate levels of impact mitigation. • May require good scientific knowledge to justify imposition of unpopular regulations. • Resentment and genuine financial hardship may occur for operators if government licensing fees are high.	• Traditionally, this approach has dominated management approaches for most tourist-wildlife interactions. • Effective in some cases; lack of compliance in others. • Inconsistencies between jurisdictions and lack of clarity on some aspects of legislation lead to confusion and reduced effectiveness.
Industry self regulation	• Australia's Nature and Ecotourism Accreditation Program aims to raise environmental standards of tourism operators, including aspects relating to wildlife, and including efforts to both minimise negative impacts and to contribute to conservation.	• If effective, greater operator support and compliance is likely than with external regulation.	• Low consumer and travel intermediary recognition of accreditation is an impediment to creation of a commercial incentive to raise environmental standards.	• Increased support for this approach in more developed countries. • Effectiveness yet to be demonstrated as most schemes are in early stages.
Economic instruments	• Commercial operator permits in the Great Barrier Reef Marine Park (Australia) are fully transferable, providing an incentive for operators to take care of the natural resource asset.	• Consistent with inevitable commercial motivation of many operators. • Can use to provide incentives for conservation-promoting behaviour, and disincentives for behaviour detrimental to wildlife.	• Often difficult to implement in existing policy environment. • Arguably unable to deal with all environmental issues.	• Considerable scope for wider application by management agencies.

Object of management	Example	Uses/ Advantages	Constraints/ Disadvantages	Evaluation of current application of method in Australia
Education	• Tourists onboard certain Australian Antarctic cruises are shown a detailed video providing guidelines on how visitors should behave in the vicinity of penguins. • Leaflets, information boards, posters and brochures are used to educate tourists about minimum disturbance giant otter watching in Manu National Park, Peru. • Most large zoos in more developed countries see education about conservation as one of their main roles.	• Well-delivered education can enhance visitor satisfaction, and influence visitor expectations. • Important in order to support regulation in cases where the need for restrictions is not well understood by visitors. • In cases where enforcement of regulations is not practicable, education may be the only practical alternative. • Most effective when a 'captive audience' of visitors occurs in a small area or on guided tours. • Face-to-face techniques in general widely thought to be most effective, although some conflicting evidence. • Most effective for addressing on-site behavioural changes if visitors have low knowledge levels about potential impacts. • Important if there is widespread ignorance of potential negative impacts. • May change visitor cognitions in ways that have positive consequences for their future conservation-related behaviour.	• The research basis for understanding what forms of education are likely to be most effective in specified situations is poor. • Although use of written wildlife watching guides and codes of practice is now widespread (especially in North America), there has been little research to determine their effectiveness. • The most effective form of education varies according to characteristics of individual visitors and according to the situation. • Effective use of education to change behaviour requires a good understanding of persuasion theory and practice, which is often lacking in such efforts. • Less effective if the 'undesirable' behaviour in question provides personal rewards to the visitor (e.g. closer views of wildlife). • Expensive, especially if face-to-face education is involved. • Often a shortage of skilled personnel.	• Trend towards increased use of education in impact management in more-developed countries. • Internationally, education has been found to be an effective tool for managing impacts of recreation on the natural environment in many cases. Although little of this research is focused on wildlife, there is much circumstantial and anecdotal evidence of its effectiveness for this purpose. • Quality and quantity of interpretation in organised wildlife tourism is apparently often poor.
Marketing	• Oklahoma Dept of Wildlife Conservation (USA) opens the Selman Bat Cave to visitors only on certain weekends and tries to keep the location otherwise hidden.	• It is advisable for all marketing to be designed to promote realistic expectations by visitors, in order to avoid disappointment as well as minimise negative impacts that could be caused by over-eager attempts to obtain expected experiences.	• Requires cooperation of the tourism industry.	• Insufficient use of marketing to influence expectations and to inform about minimal impact behaviour.
Use of environmentally responsible operators, guides or volunteers	• At Galapagos National Park (Ecuador), it is compulsory for visitors to be accompanied by a (certified) guide.	• It is advisable to create mechanisms to support and encourage use of environmentally responsible operators and guides. • Good guides may be best method to change visitor cognitions in ways that have positive consequences for their future conservation-related behaviour.	• Requires cooperation of the tourism industry. • Must not conflict with business-related principles such as competition policy.	• Widely reported as an effective mechanism.
Cooperative agreements	• Formal cooperative agreements exist between the protected area agency and two nature-based lodges in Lamington National Park (Australia), which include operators assisting with managing the impacts of nature-based tourism.	• It is advisable for protected area agencies to promote such agreements. • Can be used to help promote positive conservation initiatives as well as ameliorating negative effects of tourism on wildlife.	• Potential perception of lack of equality by other operators.	

Object of management	Example	Uses/ Advantages	Constraints/ Disadvantages	Evaluation of current application of method in Australia
Wildlife and/or habitats				
Physical alterations to harden environment	• Barriers, platforms or other designated viewing areas are often used to maintain distance between visitors and wildlife e.g.. Kenyan safari camps have human enclosures that discourage wildlife from entering, a bear-viewing platform in Katmai National Park, Alaska (USA) allows close viewing with minimal bear disturbance and increasing safety for visitors.	• Often a very effective method for controlling impacts of visitors on wildlife occurring in concentrated areas, such as breeding colonies. • Useful when it is difficult to control behaviour of visitors at a site by other means e.g. due to lack of supervision. • May also be used to enhance visitor experience.	• Less effective for more widely distributed species e.g. songbirds. • May be costly.	• Traditionally a major approach used for managing tourist-wildlife interactions. • Creative designs are emerging, providing more sophisticated wildlife viewing experiences.
Active management of wildlife and/or habitat	• Mountain gorillas in Uganda have been deliberately habituated to human approach in order to allow tour groups to approach closely without causing undue stress to the gorillas.	• Consider in cases where visitors cannot be adequately managed to control impacts.	• Usually requires considerable skill and resources. • Often not practicable.	

Adapted from Higginbottom et al. (2003). Examples are drawn from Green and Higginbottom (2001), Manfredo (2002), Richie Oberbillig (2000) and Shackley (2001); see these references for further examples.

The magnitude of any negative effects that are considered acceptable should have been determined when setting standards. If even minor changes in wildlife populations or behaviour are considered unacceptable, then management actions will need to be more rigorous than if substantial changes are considered acceptable. For example, in the case of an endangered species at a sensitive stage of its life cycle, it may be advisable to prevent any tourist access through strict regulation of access.

After consideration of all these issues, the feasibility of management actions may be further constrained by stakeholder acceptability, legislation, availability of finances and/or expertise. In practice, available finances are often the major constraint. Protected area management agencies around the world are often severely limited in the funds they can put into management, despite increased moves towards user fees and to contributions from tourism operators and volunteers (Farrell and Marion, 2001; Green and Higginbottom, 2001; World Commission on Protected Areas/ Financing Protected Areas Task Force of the World Commission, 2000; Giongo and Bosco-Nizeye *undated*). Making extensive use of volunteers to assist with management of visitors, as occurs in many US protected areas (see Richie Oberbillig, 2000 for examples relating to wildlife watching), may be one partial solution. However adequate government funding to provide for effective management remains critical (see Chapter 13 for further discussion of this point).

Except in the simplest cases, management actions should not be considered in isolation, but should be considered as a set comprising an overall strategy (Giongo and Bosco-Nizeye *undated*; Manfredo, 2002). Usually, a complementary mix of actions will be optimal, such as supporting regulation with education, economic instruments and industry self-regulation. Boxes 11.1 to 11.3 present examples of planned

approaches to managing impacts of wildlife watching at a number of different scales, illustrating some of the variety of mechanisms discussed above.

Box 11.1: Management at a single wildlife-viewing site: McNeil River State Game Sanctuary bear-viewing program, Alaska

‘ … mothers nursed cubs so close we could hear the cubs purr, and bears showed us their various fishing skills, some sitting in the water waiting for fish to swim by, some standing and watching the water, some splashing until they grabbed a fish … ’ (excerpt from a new story by Ginny Merriam cited in Richie Oberbillig, 2000).

The McNeil River State Game Sanctuary provides the opportunity for close-up viewing of brown bears in their natural habitat. The goals of the sanctuary (under legislation) that relate to bear viewing are, primarily, to protect bear populations, and as far as consistent with this, to ‘maintain and enhance the unique bear viewing opportunities within the sanctuary’. In the late 1960s there was no direct management of bears or visitors at the sanctuary, and incidents occurred where bears became aggressive to visitors and were consequently killed by them. Early management included aversive conditioning of bears to keep them away from people. Subsequently, a management program was introduced with the objectives of: avoiding adverse impacts on the bears, safety for visitors, close proximity between visitors and bears, and unobtrusive contact to enhance the viewing experience. The main management actions designed to achieve one or more of these objectives (classified as in Tables 11.2 and 11.3 of this chapter) were:

- Limiting numbers of visitors through visitor permits (regulation to manage number of visitors)
- Habituation of bears by staff and cooperative visitors (active management of wildlife)
- Education of visitors regarding behaviour in relation to bears (education of visitors to influence visitor behaviour during their tourism experience).
- Compulsory use of highly skilled guides (use of environmentally responsible guides to manage visitor behaviour)

In addition, whether intended or not, the charging of significant permit fees ($150 for state residents, $350 for others) has effectively worked as an economic instrument that has selected for highly wildlife-motivated visitors. The use of physical barriers or other physical alterations to the environment has been deliberately avoided to maintain the ‘naturalness’ of the experience.

The program is reportedly highly successful in that the bear population has increased, bears now allow close approaches by visitors while continuing their natural activities and no visitors have been injured. There is high demand for viewing permits and the location has been the subject of much media coverage. A detailed understanding of bear behaviour in response to humans has allowed reportedly effective guidelines to be developed for safe viewing. The effectiveness of the education program is reported to be facilitated by the sanctuary attracting visitors who are highly interested in wildlife and are willing to restrict their own behaviour.

The appropriateness of these management actions seems to have been associated with: the activity being under the direct control of the park management authority, the presence of high levels of expertise in relation to the wildlife, the nature of the visitors, and the inherently high quality of the experience.

Sources: Richie Oberbillig (2000); Matt and Aumiller (2002).

Box 11.2: Management of a species in relation to wildlife watching: boat-based whale watching in Australia

Whale watching has grown enormously worldwide in recent decades to recent estimates of 9 million participants per year. Since many whale species are threatened, this is seen simultaneously as an opportunity to boost support and raise revenue for whale conservation, and as a potential threat in terms of disturbance effects, especially when conducted from boats. In Australia, as in many other countries, a range of measures is in place to ameliorate potential negative effects that tourist boats and other vessels may have on whales (and other cetaceans), with an emphasis on the use of regulation. The following management actions are in place:

- National and state based legislation that specifies:
- Maximum speed of vessels in vicinity of whales
- Orientation of vessels in relation to whales
- Using a neutral gear in the vicinity of whales
- Minimum approach distances of vessels and of swimmers to whales.

Use of permits (with associated fees and conditions), including limiting their numbers in order to restrict numbers of operators in some areas.

Policies, such as developed by Great Barrier Reef Marine Park Authority.

Voluntary codes of practice developed by tourism operators in some areas.

Interpretation that includes issues relating to whale conservation (this is provided by most operators).

Research or monitoring on whales (this is carried out by some operators and is also sometimes incorporated into the visitor experience).

Some operators channel part of their revenue into whale conservation.

Unfortunately, little is known of the effectiveness of most of these measures, and it is difficult to enforce the regulatory restrictions in the marine environment (see also Chapter 2).

Sources: Green and Higginbottom (2001); Hoyt (2000); Birtles et al. (2001).

Box 11.3: Management of wildlife tourism through industry self-regulation: Australia's Nature and Ecotourism Accreditation Program

The Ecotourism Association of Australia initiated this accreditation scheme with a key goal being the raising of environmental standards by nature-based tourism operators. To achieve accreditation, operators are required to meet a large number of criteria, some of which involve measures to reduce their negative effects on wildlife and to contribute to conservation. General criteria that relate to wildlife disturbance include specifications that operations do not involve intrusion into wildlife habitat which causes significant disruption to certain aspects of their behaviour, and that they do not corner, chase or harass wildlife. There are also criteria applicable to particular types of wildlife tourism. One set of criteria deals with viewing of marine mammals and other mega fauna, with criteria such as: 'vessels are not positioned directly in the path of animals and do not chase or herd animals'. Another deals with nocturnal viewing of animals, including spotlighting (e.g. 'red filters are placed in front of spotlights once an animal has been located'), turtle viewing (e.g. 'turtles leaving the water or moving up the beach are not approached'), and glow-worm viewing (e.g. 'lights are not shone directly on the glow-worms at any time').

As of 2003, more than 140 operators have become accredited, and the Scheme has encouraged at least some of these operators to introduce new environmentally friendly practices. The scheme is now being linked to preferential treatment with regard to access to protected areas, and a related scheme has recently been introduced to provide accreditation for guides, aimed at raising standards of interpretation.

Sources: NEAPWG (2000), Ecotourism Australia (2003).

Monitoring and evaluation

Environmental monitoring is 'a process of repetitive observation of one or more elements or indicators of the environment according to pre-arranged schedules in time or space' (Selman, 1992). Whereas some impacts on the natural environment are visually obvious, impacts on wildlife are often difficult to detect without specific attempts to measure them, and may be particularly difficult to reverse unless they are detected early. Effective monitoring is thus particularly critical for wildlife tourism. However it is often difficult to perform effectively, and very little systematic and quantitative monitoring of impacts of tourism on wildlife (or most other components of the natural environment) is currently occurring (Green and Higginbottom, 2001; Borrie et al., 1998). Thus this seems to be an issue that requires particular attention in order to ensure ecological sustainability of wildlife tourism.

The question of what to monitor should have been addressed earlier in the management planning process in selecting indicators (see above section on indicators and standards). The question of how to monitor is mostly generic to monitoring the impacts of any human development or activity on the natural environment, and field techniques suited to the species in question are needed, which often require specialist knowledge or advice. The key scientific principles that need to be considered in designing any monitoring program are that:

- any changes detected are valid, rather than the result of biases or other errors in the sampling design
- any changes detected are due to tourism activity rather than other factors
- the program is able to detect changes of sufficiently small magnitude to fulfil requirements determined by management objectives (sufficient 'power' of the analysis).

In practice, and particularly in relation to wildlife, these requirements are often not met (Higginbottom et al., 2003) and suggestions on how to achieve them and overcome various obstacles are also given by these authors. In order to draw firm conclusions about the environmental impacts of tourism, fairly complex statistical designs and analyses are generally needed, such as factorial ANOVA, repeated measures ANOVA or time series analysis (see Green, 1993; Underwood, 1994; Green & Higginbottom, 2001). The requirement for statistical expertise means that rigorous monitoring is likely to be beyond the capacity of most tourism operators or park managers to implement by themselves. Therefore, they either need to call on the expertise of suitable consultants or need to upgrade skills within their own organisations. Unfortunately, funding constraints make this unlikely in many cases.

However, useful monitoring by tourism operators or protected area managers can still occur even in the absence of this expertise, as long as a standardised, appropriate sampling method is used, and the precautionary principle (Hare et al., 1990) is adopted in the face of uncertainty (see Box 11.4). It will often be sufficient to determine whether detrimental changes have occurred in indicators at one or a set of tourism sites, irrespective of whether they are caused by tourism, and then to institute further investigation to determine the causes (or prompt other organisations to do so). There may be unrealised creative opportunities for operators to incorporate monitoring into the visitor experiences they provide, in ways that enhance visitor satisfaction (Green and Higginbottom, 2001; Tourism Queensland/Queensland EPA, 2002). Some commercial operators, such as many who are involved in whale watching, already do this.

Box. 11.4: An example of published suggestions for monitoring of impacts of tourism on wildlife by tourism operators

Tourism Queensland and the Queensland Environmental Protection Authority (2002) have published guidelines to encourage tourism operators to monitor the possible environmental impacts of their activities. In relation to wildlife, they recommend:
'Bird Watching – Record the number of bird species and the estimated number of individuals observed. Observe trends in the number and types of animals observed. '
'Spotlighting – Observe trends in the number and species of animals spotted. Monitor animal numbers observed, and record the number of species sighted and the number of torches or spotlights used. '
'Fauna Watching – Record the number of species and the estimated number of individuals observed. Observe trends in the number and types of animals observed. Record any incidents of sickness among animals. '
'Marine mammal and mega fauna viewing – Monitor the community population by recording marine mammal sightings (including numbers of young) and approximate locations. '
'Fish feeding – monitor the number of fish species feeding (and the most common species) and the length of time taken to consume a given amount of food. '

They also provide brief suggestions on how to interpret such data, such as reviewing the data regularly to identify trends. They warn that all natural systems will show some variability and stress that any negative trends may be due to a range of factors other than tourism, and that it is important to identify the cause.

Nevertheless, the issue of ability to detect real changes that are occurring early enough to reverse them (statistically known as 'power') remains critical. This applies especially to long-lived, slow breeding species like whales for which declines may take a long time to reverse, and for species that are already in low numbers or threatened by other factors. There seems to be a need for greater collaboration between managers and scientists to determine valid yet realistic monitoring protocols under various different conditions.

Assuming that effective monitoring is occurring, it is important that the results are evaluated regularly to determine whether standards are being met. If this is not the case, there needs to be a clear mechanism for reconsidering and changing the applied management actions. In evaluating monitoring data, especially when clear standards have not been developed, managers should have planned in advance what they will do in the face of uncertainty about the presence of magnitude of impacts. For example, what happens if there is a population decline, but no evidence that this is due to tourism? Or if there is a short-term decline, but which could be part of a long-term natural cycle? In the planning stages, managers and other stakeholders need to decide when it is appropriate to apply the precautionary principle and either impose a more stringent management regime or possibly exclude tourism altogether.

Future directions for managing impacts of wildlife tourism on wildlife

In order to optimise impacts of wildlife tourism on wildlife, it is critical for managers to begin by defining goals in relation to those impacts, and then to establish a management regime designed to meet these goals. This applies not only to natural resource managers, but also to tourism operators who wish to be environmentally responsible and ensure that their key resource is protected. This chapter has proposed a broad framework and ideas to help make this regime as effective as possible in meeting those goals. While management has historically been aimed mostly at ameliorating negative impacts on wildlife, a more holistic view entails managing the

net impacts (positive and negative), in comparison to alternative land uses or fates of the wildlife concerned.

Effective management regimes at the level of individual tourism sites and activities need to be supported by an effective regulatory and policy environment to protect against deterioration of wildlife resources and strategically to enhance links between wildlife tourism and conservation. For species, activities or sites where the threat to wildlife populations is considered serious and not amenable to effective management, wildlife tourism may need to be precluded. While wildlife management is often seen as the primary responsibility of government, it is up to the tourism industry, conservation NGOs and other stakeholders to lobby and work with government to implement appropriate management measures and to increase funding levels for management. It is encouraging that initiatives of this sort are occurring in several more-developed countries including the Watchable Wildlife Program and Teaming with Wildlife in the USA, the recently formed Wildlife Tourism Australia and the Scottish Wildlife and Nature Tourism Operators Association (see Chapter 13). Many integrated conservation and development programs in less-developed countries – typically centred on protected areas – are also working towards such goals, although their task is often more difficult (see Chapter 7).

Further research should be strategically aimed at a better understanding of the effectiveness of various management approaches (especially education) in different situations, and at developing a suite of practical monitoring methods suited to particular species.

A lack of adequate funding for researching, managing and monitoring the effects of nature-based and wildlife tourism on the natural environment (including wildlife) is perhaps the most severe constraint on effective management. Greater commitment from governments and the tourism industry is needed to provide the resources required to remove this constraint and make effective management a reality. This increased commitment is crucial to sustainability of wildlife tourism. The economic contribution and potential of wildlife tourism, coupled with the potential vulnerability of much of the wildlife resource, should be arguments used to encourage enhanced investment in effective management of impacts on wildlife.

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Chapter 12

The Role of Interpretation in Wildlife Tourism

Gianna Moscardo, Barbara Woods and Rebecca Saltzer

Introduction

Interpretation aims to stimulate interest, promote learning, guide visitors in appropriate behaviour for sustainable tourism and encourage enjoyment and satisfaction. This chapter discusses the role of interpretation in sustainable wildlife tourism. For the purpose of this chapter the term wildlife tourism will be restricted to activities, attractions and tours that involve non-consumptive wildlife viewing or interaction opportunities. There is very little information available on the role of interpretation in consumptive wildlife activities such as hunting or fishing. A review of interpretive methods is provided and international examples are used to illustrate the potential roles of interpretation in wildlife tourism settings. Some issues specific to the practice of interpreting wildlife are discussed. A review of evaluation research in the area of wildlife interpretation will also demonstrate that little specific research is available and that there has been virtually no theoretical discussion of how to design effective wildlife interpretation. The authors have been involved in a long running program of interpretation evaluation and wildlife tourism research. This chapter presents a conceptual model based on both this research and theories from educational and social psychology. This mindfulness model is presented to assist readers' understanding of how to design interpretation that attracts attention and fosters learning and enjoyment.

What is interpretation?

Interpretation broadly refers to educational activities used in places like zoos, museums, heritage sites and national parks, to tell visitors about the significance or meaning of what they are experiencing. Interpretation includes such things as signs, brochures, pamphlets, and guided tours, as well as displays and exhibits in visitor centres, zoos and aquaria. The original definition of interpretation provided by Tilden stated that interpretation is: 'an educational activity which aims to reveal meanings and relationships through the use of original objects, by first hand experience, and by illustrative media, rather than simply to communicate factual information' (1977, p.8). A more recent definition from the Society for Interpreting Britain's Heritage (cited in Moscardo, 1999, p.8) describes interpretation as: 'the process of communicating to people the significance of a place or object so that they enjoy it more, understand their heritage and environment better; and develop a positive attitude toward conservation.'

While these definitions align interpretation with education, several authors have noted that the primary aim of this education is to provide visitors with sufficient information to further educate themselves (Markwell & Weiler, 1998; Moscardo, 1998). In addition the definitions indicate that interpretation is a form of persuasive communication in that it has the aim of encouraging the development of a conservation ethic. Further the second definition includes the component of enjoyment. Interpretation differs from environmental education in that it is provided in an informal fashion to people who are at leisure, thus enjoyment is an important element of interpretation (Ham, 1992; Screven, 1995; Bright & Pierce, 2002).

How does interpretation contribute to sustainable wildlife tourism?

Sustainable tourism can be seen as based upon three core principles. The first is quality. Sustainable tourism should provide a quality experience for visitors, while improving the quality of life of the host community and protecting the quality of the environment (Inskeep, 1991). The second core principle is continuity. Sustainable tourism requires continuity of the resources upon which tourism is based, continuity of the culture of the host community, and continuity of visitor support or tourist demand (Wall, 1993). Finally, sustainable tourism is about balance. It is tourism that balances the needs of the host, guest and the destination environment (Bramwell & Lane, 1993).

There are three main aspects involved in the argument for interpretation supporting sustainable wildlife tourism. Firstly, interpretation can be a means of managing the interactions between wildlife and tourists. The educational element of interpretation is critical in providing visitors with information on how to behave in a minimal-impact fashion with regard to the wildlife with which they are seeking to interact, in explaining management strategies, and in supporting safety messages (McArthur & Hall, 1993; Moscardo, 1998). Secondly, the educational element of interpretation can also raise visitors' knowledge and awareness of wildlife and habitats and thus can encourage pro-conservation attitudes and motivation to act on broader conservation issues (Gray, 1993). Thirdly, quality interpretation can enhance visitor satisfaction and through this can contribute to the commercial viability of tourist operations (Ham, 1992; Moscardo, 1998).

Supporting the management of tourist wildlife interactions

The damage tourism causes to people, economy and environment of the host area, especially in the long-term, remains hidden from the tourist. He has been left out of all discussion on the subject, 'They are therefore carefree and ignorant rather than devious. To lay all blame at their door would be as wrong as denying their responsibility. But they should certainly be made aware of the situation.' (Krippendorf, 1987, p. 43)

The argument made in this quote is a simple one. If managers of a tourist setting want visitors to behave in a particular fashion, then they have to tell the visitors what they want. While knowledge alone may not be sufficient to encourage appropriate behaviours in wildlife tourism situations, it is certainly a necessary condition (Larson, 1995; Bright & Pierce, 2002; Whittaker, Vaske & Manfredo, 2002). Thus an important role for interpretation in sustainable wildlife tourism is to inform visitors of the consequences of certain behaviours and to provide education to encourage minimal impacts.

There is a growing body of evidence that indicates that interpretation programs in natural areas can be effective in terms of informing visitors about appropriate behaviours and encouraging them to engage in those behaviours (see Roggenbuck, 1992; Ballantyne, 1998; Moscardo, 1999; and Garrod & Wilson, 2003, for examples and reviews of this research). There is much less research available on wildlife interpretation. The majority of the available research is, however, consistent with Roggenbuck's conclusions for nature interpretation in general.

An example of the effectiveness of interpretation in managing the interactions between humans and wildlife can be found in Frost and McCool's (1988) study of a bald eagle viewing site. This study found that well-explained regulations combined

with interpretation were successful in modifying visitor behaviour. After experiencing an interpretation program almost 90% of the visitors understood that the restrictions were necessary and 88% felt the restrictions either had no negative effect or facilitated their experience (Frost & McCool, 1988). In a similar fashion Newsome Moore and Dowling (2002) report successful learning outcomes from an interpretive program aimed at encouraging divers to behave in a minimal impact fashion. These authors provide evidence that the interpretive program resulted in less coral damage in areas along the Egyptian coast of the Red Sea (see also the example in Box 12.1). Kreger and Mench (1995) provide a review of interpretation evaluation research in zoos that concludes there is evidence that zoo interpretation programs can be successful in encouraging greater knowledge of wildlife and awareness of wildlife conservation issues.

Not all interpretation programs, however, are effective in encouraging minimal impact behaviours. De White and Jacobson (1994), for example, found that learning about elephants was significantly greater when zoo visitors experienced a structured, participatory education program about the elephants. Mere exposure to the elephants in their normal display areas with traditional signs was not sufficient to influence learning. These findings highlight the complexity of the link between exposure to information, retention of that information, changes in attitudes and then changes in behaviour. This complexity will be discussed in more detail in a later section on relevant psychological theory.

Box 12.1: Interpretation and coral protection in the British Virgin Islands

Coral reefs are major tourist attractions in Australia, especially the Great Barrier Reef, the Middle East, the Caribbean, South East Asia and the South Pacific. These marine environments are famous not just for the coral reefs themselves, but also for the opportunities they provide to see a wide range of other marine wildlife species. There is a number of ways tourists can view coral reefs including underwater observatories, glass-bottom boats, semi-submersible craft, snorkelling and scuba diving. Arguably the hardest to manage of these tourist activities are the last two. Divers have the potential to damage coral reefs through breakage resulting from handling the coral, standing or leaning on coral, and damage from equipment such as regulators and fins coming into contact with the coral as divers pass (Dinesen & Oliver, 1997).

Effective interpretation is one way to reduce these negative impacts on coral. Townsend (2003) provides an example of this in a study of divers in the British Virgin Islands. Prior to the study divers were typically given a basic briefing on the marine life likely to be seen at the target dive spots and basic safety and scheduling information. Minimal impact behaviours were rarely included in these briefings. This less structured interpretation was replaced with a more structured program which included the development of posters on coral species and minimal impact dive behaviours that were put on the dive boats and a request to the dive instructors to include three themes in their normal briefings. These three themes were:

- Coral is a living and fragile animal
- Divers should try to stay at least one metre above the coral
- Divers should try to stay horizontal to avoid accidental contact with the corals

Townsend evaluated this new interpretation program by observing diver behaviour both before and after the program. The analyses reported showed a major drop in the number of both voluntary and involuntary contacts between divers and the coral reefs.

Source: Townsend, 2003.

Encouraging conservation attitudes

Much of the available research into interpretive effectiveness has focussed on either changes in knowledge, levels of visitor enjoyment and/or changes in behaviour as the outcome measures. Actual changes in conservation attitudes have been rarely examined, except in the area of captive wildlife settings such as zoos and aquaria. A number of these captive wildlife studies that have demonstrated links between good-quality, structured interpretation and learning about wildlife, also reported connections between this increased knowledge and more positive wildlife conservation attitudes (de White & Jacobson, 1994; Kreger & Mench, 1995; Tarrant, Bright & Cordell, 1997; Bright & Pierce, 2002). As in the previous section, changes in conservation attitudes were associated with structured, quality, interpretation programs and not simply exposure to the wildlife (Swanagan, 2000; Manfredo & Driver, 2002). Morgan and Gramann (1988), for example, found that mere exposure to snakes did not improve attitudes, but interpretation through keeper talks using modelling behaviour and direct contact did.

Enhancing visitor experiences and satisfaction

One factor that has been found to be associated with effective interpretation programs is that of enjoyment (Kreger & Mench, 1995; Bright & Pierce, 2002). People who enjoy an interpretive program are usually more likely to learn from it and to change their attitudes and behaviours. Thus satisfaction can be an important precursor to other outcomes of interpretation. But interpretation can also be a major component of the actual wildlife experience and make significant contributions to satisfaction (see Box 12.2 for an example). Table 12.1 summarises the findings of several wildlife tourism studies identified through an extensive literature review. It shows that interpretive activities and learning are commonly-reported contributors to visitor satisfaction. In addition, effective interpretation programs have the potential to assist people to better see and identify wildlife and natural wildlife behaviour, which are also factors associated with satisfaction.

Box 12.2: Interpretation and tourist satisfaction on the Great Barrier Reef

The opportunity to see marine wildlife is a critical component of the promotion of Australia's Great Barrier Reef (GBR) as a major international tourist destination. Approximately 1.5 million tourists access the GBR each year with commercial tour operators, most of them on one-day reef trips. These reef trips are available on a number of different types and sizes of boats. The most popular of these options is large catamarans that take visitors to a floating pontoon moored near reef sites. Other boats use coral cays and islands as stopping points or simply anchor near reef sites. Most of these reef day trips, especially those using larger boats, offer visitors the opportunity to see the coral reefs and other marine wildlife from glass-bottom boats or semi-submersible craft, underwater viewing areas and first hand through snorkelling or scuba diving.

All commercial tour operators in the Great Barrier Reef Marine Park (GBRMP) must have a permit and these permits, in addition to plans of management, set out what activities are allowed in certain areas and guide the number and size of boats using certain sites. A standard permit condition for tour operators in the GBRMP is that they must provide interpretation to their guests about the GBR, its significance and its management. Many operators use a combination of briefings given by staff as the boat leaves the coast and written and video material. The large pontoon operations also provide interpretive staff who take guided snorkel tours, and give talks on the glass bottom boats and on the pontoon.

A survey of more than 740 passengers on eight different day trips from both Cairns and Airlie Beach found that opportunities to see marine wildlife were important factors in visitors' decision to visit the GBR. In addition the study found high levels of satisfaction with the overall experience with an average rating of 8 on a scale from 0 (not at all satisfied) to 10 (very satisfied).

A series of analyses were conducted to determine the relative importance of a variety of different variables in predicting overall satisfaction. A number of the results highlighted the importance of wildlife interpretation to visitors' overall satisfaction. For example, visitors who went on glass-bottom boat or semi-submersible tours, where interpretation is usually provided, were significantly more likely to be satisfied than visitors who stayed on the pontoon or main boat. A multiple regression analysis found that the three most important predictors of overall satisfaction were the range or variety of wildlife seen, the amount visitors felt they had learnt about the wildlife and how natural they thought the wildlife encounters were. Clearly interpretation plays a central role in visitor satisfaction. Further, it seems that there were links between interpretation and the other predictors of satisfaction. That is, interpretation offered a mechanism to assist people in recognising and identifying a wider variety of coral and fish and in turn this was then related to higher overall satisfaction.

Source: Moscardo, 2001

Table 12.1: Factors associated with visitor satisfaction with wildlife tourism experiences. Factors relating to interpretation are given in bold.

Study	**Factors contributing to satisfaction/enjoyment***
Duffus & Dearden, (1993) Whale watching tours on Canada's Pacific Coast – killer whales	Seeing whales Getting close to whales Seeing displays of whale behaviour Seeing coastal scenery **Having a naturalist/crew member to answer questions** Seeing other marine mammals.
Davis et al., (1997) Whale shark tours in Western Australia	Being close to nature Seeing large animals Seeing many different types of marine life Excitement **Learning about the marine environment** Adventure Underwater scenery Freedom Relaxation Being with friends
Foxlee, (1999) Whale watching in Hervey Bay, Australia	Number of whales seen Distance from whales Whale activity **Information available about whales** **Information available about other marine life** **Style in which information was presented**
Tourism Queensland, (1999) Whale watching at several locations in Queensland, Australia	Number of whales seen Smaller boats Better weather **Onboard commentaries**
Bitgood et al., (1988) Review of factors associated with satisfaction at zoos and aquaria	Being able to get close or touch wildlife **Educational shows and/or demonstrations** Pleasant outdoor settings Naturalistic enclosures Being able to see wildlife easily

* Factors are presented in order of importance

The authors of this chapter have been involved in a series of visitor surveys conducted at 15 different wildlife tourism sites or businesses in New Zealand and Australia. These sites include a number of zoos and other captive wildlife attractions, as well as natural areas famous for their opportunities to view free-ranging wildlife.

The overall sample is made up of responses from nearly 5000 visitors and includes international visitors from a number of different countries and Australian and New Zealand domestic travellers, and both tour group participants and independent visitors. Overall, strong positive relationships were found between overall satisfaction with the wildlife experience and how much visitors believed they learnt about wildlife (Pearson's r = .563). This was the strongest correlation found in the analyses. This finding was also supported by an open-ended question included in all of the visitor surveys: '*What could be improved about this experience*?' Visitors in all 15 of the case studies made suggestions for the provision of more information and/or to improve the information or guides at a site. Recommendations of this kind featured in the top five suggested improvements for 12 out of the 15 case studies. The most common types of comments made by visitors are listed in Table 12.2.

Table 12.2: Most common visitor suggestions to improve wildlife interpretation

• More/improved information about wildlife/species specific
• More information/signage around the park
• Provide information handouts/brochures
• A more exciting video with more information at the start of the tour
• Better audiovisual presentation
• More background information before viewing the wildlife
• More information on where to find wildlife
• Give visitors more information about the wildlife they see
• More information on best times to see animals
• Guides need to be more informed

Types of wildlife interpretation

There is a number of methods by which visitors can be encouraged to learn about and appreciate the animals they are viewing. In many wildlife tourism settings, a number of methods is used, and together these methods constitute the interpretive experience. Methods used include interpretive signs, models, brochures, guides, demonstrations and shows, video, audio commentary, computers and books. Captive animal displays are made up of various combinations of these different media, while viewing areas and tours to view free-ranging wildlife typically use guides and interpretive signs to provide visitors with information. The prevalence of each method depends largely on the type of setting where the interpretation takes place, the aims of the interpretation, and the resources available for interpretation.

Interpretive signs and brochures

One of the most commonly encountered forms of wildlife interpretation is the interpretive sign. Interpretive signs are used extensively in captive settings and in settings where visitors are dispersed throughout a natural area, or where visitation is unpredictable and sporadic. They are particularly useful in places such as national parks where wildlife is often seen, so that visitors always have access to some information about the wildlife and are given any required warnings about getting close to, feeding or interacting with wildlife. Signs can also be used to enhance self-guided trails and as part of static displays in visitor centres or on viewing platforms (Bright & Pierce, 2002). On the other hand, signs can be expensive to install and maintain. Also they cannot provide personalised information to visitors (Knudson et al., 1995; Bright & Pierce, 2002). Another issue related to signs interpreting wildlife is that the sign

may not always be in the same place as the animal or may not relate to what the animal is actually doing when the visitors arrive. This reflects the mismatch between the static nature of interpretive signs and the dynamic nature of wildlife behaviour and is an issue both for settings such as national parks and zoos and aquaria.

Given the popularity of interpretive signs it is not surprising to find an extensive evaluation and design literature focussed specifically on this form of interpretation. Table 12.3 provides a summary of the design principles that have been proposed specifically for effective interpretive sign design by a number of authors based on evaluation research conducted with signs in a number of different interpretive settings (see also Woods 1998). Many of these principles also apply to interpretive brochures and pamphlets. These have similar benefits to signs, with the additional advantage of being able to be distributed to off-site places such as schools and libraries, and are able to be taken away from the site and read over again (Knudson et al., 1995). Many zoos provide colour guidebooks for purchase that serve the dual purpose of a souvenir and providing interpretation about the animals displayed at the zoo.

Table 12.3: Design principles for effective interpretive signs

General category	Specific guidelines
Warning signs	Must have 4 key elements: • signal word of danger, warning or caution • statement of the hazard • example of the consequences of not heeding the warning • instructions on how to avoid the hazard.
Placement of signs	Close to the centre of the line of vision of visitors as they approach. Perpendicular rather than parallel to the main visitors pathways.
Getting visitor attention	Use large colourful elements in the sign. Use sliding panels, lifting flaps. Use contrast in headings and titles. Use three-dimensional features. Add surprise to the title. Ask questions in titles. Use illustrations.
Making text readable	Use short, simple sentences. Use short, familiar words and avoid jargon and scientific expressions. Use an active rather than a passive voice and speak directly to the reader. Use larger well-spaced type. Use serif typefaces and a mixture of lower and upper case, not all upper case. Use a clear contrast between the type and the background.
Formatting text	Break the text in paragraphs and use headings and subheadings. Lines should be between 40 and 65 characters in length. Margins should be left-justified with even spaces between the words.
Use of illustrations	Use fewer illustrations and leave enough white space around illustrations and text. Illustrations should be relevant to the text. Illustrations should be simple and not require extra text to explain them.

Source: Moscardo, Ballantyne & Hughes, 2003, p. 510.

Captive animal displays

Captive settings such as zoos, aquaria and wildlife parks are popular wildlife-based tourist attractions (see Chapter 3). The design of animal displays in these settings is a complex and important task which must consider the needs of the animals being displayed, the needs of the staff whose job it is to care for these animals, and the needs of the visitors whose attendance supports these enterprises (Polakowski, 1987).

Over time there has been a number of changes in the way animals are displayed in zoos and other captive settings with an overall trend towards to more naturalistic enclosures (Shettel-Neuber, 1988; see Chapter 3). Some designers claimed that there

were greater educational benefits associated with these more naturalistic displays as they provided information about the animal's habitat and allowed more natural animal behaviours to be observed. The available evidence indicates that visitors respond positively to some aspects of these enclosures including the presentation of a variety of animals in one place, the ability to see animals moving and a sense that animals were happier (de White & Jacobson, 1994; Ford, 1995). Despite this visitor preference, there is little published evidence that these displays resulted in greater visitor learning.

A more recent trend in the display of captive animals involves the combination of technology, new construction techniques and a variety of additional interpretive media such as displays, signs, interactive models and video footage of animals to create what is sometimes referred to as an immersion experience (Woods, 1998). Given the more extensive use of interactive and structured interpretive programs associated with these new captive animal displays it seems likely that they are more effective in achieving various wildlife interpretation goals. Broad and Weiler's (1998) study of visitor responses to tiger displays at two different captive wildlife settings provides some evidence to support this claim. This study compared visitors and their learning behaviours at two different tiger exhibits - one in the naturalistic style in an open-air zoo and one in the newer style at a theme park. In the latter cases the tigers are displayed in a naturalistic enclosure supported by interpretive displays, regular presentations by the keepers and a permanently available staff member to answer visitor questions. The researchers concluded that while there was evidence of visitor learning in both settings, the newer style of exhibit allowed for more interaction between the visitor and the interpreters and offered more learning opportunities (Broad and Weiler, 1998).

Guides

The Broad and Weiler study of interpretation of tigers demonstrated the importance of having on-site personal interpretation in the form of a guide or a keeper. Guides are another commonly used method of interpretation in wildlife tourism, especially in free-ranging settings. Guides are particularly useful because they can enforce and demonstrate minimal impact behaviours and can manage interactions between visitors and the wildlife. Guides are most useful in sites with a large numbers of visitors, where infrastructure is developed to restrict independent access to the wildlife, and where visitors can be contained in a concentrated area. Other benefits of having trained interpreters on site include their ability to attract the attention of visitors, to answer questions, to provide social interaction, and to tailor the information given to visitors to match what the animals are doing at the time. The disadvantages are that effective guides can be costly to train and employ and visitor numbers need to be managed for optimum communication with visitors.

Although there is a widespread belief amongst interpretive authors and protected-area managers that guides or on-site interpreters are the most effective method for increasing visitor learning, there is little published research into the effectiveness of this form of interpretation (McArthur & Hall, 1993; Moscardo, 1996). What is available suggests that as with other forms of interpretation, personal interaction with an interpreter can be effective but only if certain conditions are met. Horn (1980), for example, found that Boston Museum guides who followed a standard lecture style format were not as effective in enhancing visitor learning as those who asked visitors

questions and encouraged discussion and participation. In a study of guided nature tours in Ohio, Brockmeyer and colleagues (1983) found that visitor learning was significantly enhanced if the guide suggested multi-sensory activities for the tour participants to engage in.

Animal shows or demonstrations

Animal shows are popular at zoos and theme parks because they involve interacting with the animals, visitors can see the animals clearly, often the animals are moving, and visitors can have the opportunity to ask questions, to touch the animals and to develop an emotional response which encourages learning (Wolf & Tymitz, 1979; Robertson & MacKillop, 1997). Many of the studies that have been used to argue that interpretation can be effective in encouraging positive wildlife conservation attitudes have been evaluations of animal demonstrations or shows in these captive settings (de White & Jacobson, 1994; Kreger & Mench, 1995; Broad & Weiler, 1998). Despite the evidence of the success of this form of interpretation two key concerns have been raised about their use. The first is that animal shows or demonstrations will be effective only when they are part of a structured activity with clear interpretive or educational goals (Kreger & Mench, 1995; Breheny, 1998). The second is that it is important that steps be taken to avoid giving the visitors the impression that the animals are tame or are pets as this promotes unsafe behaviour and encourages visitors to think about the animals but not their habitats (Breheny, 1998).

Remote viewing technologies

Some other techniques used in wildlife interpretation include interactive computers and technologies for remote viewing of wildlife (see Box 12.3 for an example). Interactive computers are useful for presenting information in a self-paced, visitor-initiated format. However, they can be costly to install and maintain, and can only be used in indoor, supervised settings. Remote viewing involves the use of cameras to broadcast images of wildlife behaviour from within their dens, burrows, nesting or breeding sites back to a visitor centre. Such technology allows visitors to see animals in way not otherwise possible and also allows for large numbers of visitors to watch wildlife with minimal impacts on the wildlife (Turner & Speedie, 1998; Dyer, 1999).

Box 12.3: Wildlife interpretation in practice: The Royal Albatross Centre, New Zealand

Taiaroa Head on the Otago Peninsula near Dunedin on the South Island of New Zealand is a nesting site of the Northern Royal Albatross. The main breeding grounds for these birds are the outlying islands of New Zealand and this site situated so close to an urban centre offers a rare opportunity for visitors to see these animals and their nesting behaviours. The Northern Royal Albatross is a large seabird with an adult wingspan of about three metres. In 1964 the area was gazetted as a nature reserve and in 1971 the New Zealand Wildlife Service began to allow limited public viewing of the colony. Increased public interest resulted in the building of an observatory and more recently a visitor centre.

The visitor centre offers a number of interactive, audio-visual and static displays about the biology of the albatross, the colony, and the surrounding environment. Included in this centre is a live broadcast from cameras hidden within the nesting site. Various lookouts outside the centre offer views of the albatross returning from the sea and practising flying. Visitors who wish to view the nesting area must purchase a ticket for a guided tour. They watch a ten-minute video covering breeding, social habits and other interesting characteristics of the Royal Albatross, followed by opportunities to ask questions of the guide. The guide then escorts

visitors along the path to the enclosed bird observatory building above the nesting site. Visitors are able to use the observatory binoculars for a closer view of the nesting area. The guides provide further information and answer questions while at the viewing site. After the tour, visitors return with the guide to the visitor centre.

A survey of 312 tour participants found very positive ratings for this experience that combines several different forms of interpretation. Nearly three quarters of the visitors surveyed (72%) gave their experience a score of 8 or higher out of 10. In addition to contributing to a high level of satisfaction, the interpretive program also appeared to be effective in enhancing visitor knowledge of the Northern Royal Albatross with 90% of the surveyed visitors listing new facts or information that they had learnt about this species.

Sources: Parry and Robertson, 1998; Saltzer 2003.

Wildlife interpretation challenges

Interpreting hidden and inactive wildlife

In some habitats and captive enclosures it can be difficult to view animals. Many animals are nocturnal, and it can be difficult to view them during the day when visitor numbers are highest. Many animals sleep or rest for long periods of time, which may also be disappointing to visitors. Several authors have argued that visitors need to be educated about animal activity (Bitgood et al., 1986; Ford, 1995). Many species are rarely active and if visitors are told that they should not expect activity from these species their viewing experience may be less disappointing. It may be useful in such cases to use photographs, models or illustrations in adjacent displays that clearly depict the animal, or to advise visitors of times and locations when the animals are likely to be active. Interpretation can also draw visitor attention to other evidence of animals that can be seen, such as tracks, nibbled fruit, droppings, birdcalls and other wildlife sounds. Modern audiovisual equipment can also be employed to ease frustration in these situations. In addition this type of interpretation can provide contextual and extra information that can change visitor perceptions of the animals.

Feeding wildlife

A major management issue for wildlife tourism managers is that of whether or not to feed wildlife (see Chapter 5 for a review of this topic). Despite the ongoing debate over this issue in the literature (see Moore et al., 1997 and Orams, 2002 for reviews of the negative impacts from, and arguments against, this activity, and Rosenfeld, 1981 and Gill, 2002 for arguments in support of this activity), many settings have moved to ban this practice. A core component of the effective management of wildlife feeding involves developing an understanding of why visitors do it. Another component is the development of effective programs to support this management decision so that visitors don't feed the wildlife, are positive about the rules and are satisfied with their experience (Moore et al. 1997). To date there are few, if any, published evaluations of programs designed to discourage wildlife feeding.

Anthropomorphism

One ongoing criticism of wildlife interpretation is that it encourages anthropomorphism (Ford, 1995; Woods, 1998). Anthropomorphism can be defined as the use of human motives, values, and emotional responses to describe and explain animal behaviour. It can range from a situation such as can be found in children's story books where animals dress as humans and walk as humans, and have the capacity to

talk, through to less complex situations such as a visitor labelling an inactive animal as 'lazy' or 'bored' (Lerner & Kaloff, 1999). For some this is an undesirable activity that reflects and perpetuates an anthropocentric and sentimental view of the environment (Benson, 1993; Ford, 1995). Others argue, however, that 'anthropomorphic inference may deserve its bad reputation within the narrow confines of Cartesian science, but it is a highly useful tool' (Katcher & Wilkins, 1993, p. 187). The argument is that humans cannot learn without being able to connect new information to what they already know and thus wildlife interpreters have no choice but to build connections between the wildlife species being presented and human experiences (Rosenfeld, 1981; Sandford, 1997). Some sociologists have gone further and argued that charges of anthropomorphism are themselves based on a distinctly human centric view of the world which does not recognise the links and similarities between humans and other animals (Sanders & Arluke, 1993; Lerner & Kalof, 1999; Franklin & White, 2001).

Interpreting less-popular species

Interpreters have also been accused of focussing on popular animals at the expense of many other species, in particular, invertebrates. Invertebrates have suffered catastrophic losses from extinction, yet the public appears largely unaware of any impact on human wellbeing (Kellert, 1993). A growing area of interest lies in the interpretation of the least popular animals (see Gray, 1993; Glickman, 1995; Lerner & Kalof, 1999; Woods, 2000). While education is unlikely to encourage affection for these animals, an appreciation of the role they play in ecosystems and their contribution to human wellbeing may dampen the prevailing negative attitudes. A study by Broad (1996), for example, confirmed that awareness of endangered species was heightened after a visit to the zoo, especially for less charismatic and lower profile animals. Thus interpretation may assist the recognition of the positive values of invertebrates and least popular animals.

What is known about the effectiveness of wildlife interpretation?

Several themes have emerged in this review of the available research literature on the effectiveness of wildlife interpretation. The first is that mere exposure to wildlife is unlikely to have much impact on visitors' knowledge and wildlife conservation attitudes. Wildlife-based experiences need to be associated with structured, quality interpretation programs to be able to influence what visitors think and believe. The second is that there are several factors that are consistently associated with more effective interpretive activities. These are:

- Inclusion of multi-sensory activities
- Inclusion of participatory activities
- Building of personal connections to visitors
- Easily read interpretive signs

See Patterson and Bitgood, 1988 and Borun et al., 1997, for a review of these factors.

Relevant psychological theories of learning and attitude/behaviour change

According to Screven (1995) good interpretive design is the result of successfully combining principles of visitor psychology and communication design. In particular effective interpretation needs to based upon a good understanding of the:

- Psychology of attention (Forestell, 1992; Screven, 1995)

- Psychology of learning (Forestell, 1992; Screven, 1995)
- Research into persuasive communication and theories of attitude change (Moore et al., 1997; Bright & Pierce, 2002; Whittaker et al., 2002)
- Psychology of attitude behaviour links (Whittaker et al. 2002)

Psychology of attention

There is a very large body of research evidence that has identified a number of features of settings that consistently attracts human attention (Myers, 1996; Moscardo, 1998). These are:

- Extreme stimuli - very large, very colourful, very loud things attract our attention
- Movement and action
- Contrast
- Unexpected, novel and surprising elements
- Features that are personally relevant and/or interesting

According to Screven (1995) there are two types of attention, casual and focussed. Focussed attention is associated with more mental or cognitive effort and is more likely to occur in the presence of the latter two features on the list above. Screven (1995) further argues that it is this type of attention that encourages visitors to keep paying attention to an interpretive message.

Psychology of learning

Attention is a necessary, although not sufficient, condition for learning. Learning requires active mental processing of information and some change in the cognitive schema that we hold. The term cognitive schema refers to the general knowledge structure that humans construct to help them understand and predict what is happening around them (Sternberg & Ben-Zeev, 2001). Piaget (1972) provides the most widely accepted theory of learning. In this theory people learn new information by a combination of two processes – assimilation and accommodation. Assimilation fits new information into an existing framework that has been built up over time through experience. Accommodation requires a change in the schema to fit the new information.

A young child, for example, may have a very simple schema for ‘dogs’, which could be described as ‘non-human objects that can be found in the yards around houses’. Her parents obligingly gave her the label dog to describe such a thing. As this child gathers more experience with different non-human objects in house yards she may begin to develop a more complex schema by adding new examples such as cats, bicycles, and lawn mowers. All these would still be called ‘dogs’ as they fit the existing schema. This is an example of assimilation or the fitting of new information into an existing structure. But it is likely that her parents will correct her use of the label ‘dogs’ and will highlight features that distinguish between these different non-human house yard objects. With this additional information it becomes clear to the child that she will have to create several sub categories of non-human objects in the house yard. This is accommodation and it refers to the adaptation and modification of a scheme to better fit the new information. It is important to note, however, that

accommodation is still built upon existing schema (Moscardo, 1998; Sternberg & Ben-Zeev, 2001).

Both of these processes require active mental processing of the new information and retention of that information in memory. Dual processing is a long-standing concept in cognitive psychology (Craik & Lockhart. 1972; Shiffrin & Schneider, 1977; Sternberg & Ben-Zeev, 2001) and refers to the existence of two different kinds of information processing – a shallow or superficial processing and a deeper processing. Shallow processing results in only temporary memory storage of information, while deeper processing is more likely to result in a greater retention of information. Longer memory retention is a necessary, but again not sufficient, prerequisite for any learning process to occur (Sternberg & Ben-Zeev, 2001; Gross, 2001).

Persuasive communication and attitude change

In addition to active mental processing, learning also requires the new information to be accepted by the receiver. In other words, a person may engage in active mental or deep processing of new information, but not accept its validity or reliability and so reject it. The area of social psychology focussed on persuasive communication is concerned with exactly this issue. In order to change the way people think a communication must not only encourage deeper processing to ensure that the information is remembered, it must also persuade the listener or receiver that the new information is correct and should be accepted (Baron & Byrne, 1997). In particular persuasive communication research has concentrated on changes in attitudes, which are a particular type of cognitive schema. Attitudes are schema that include an evaluative component and which direct actions (Baron & Byrne, 1997; Mannell & Kleiber, 1997). Petty and colleagues (1992) provide a summary of the main findings of research into the features of communication that are associated with knowledge and attitude change.

Two different pathways to attitude change have also been identified (Gross, 2001). Although different labels are used by different teams of researchers (Petty and Cacioppo, 1986 refer to central versus peripheral routes to attitude change, while Chaiken and Stangor, 1987 refer to heuristic versus systematic processing and Langer, 1989 uses the labels mindfulness and mindlessness), the core idea is similar. Certain features of persuasive communication encourage more active, detailed, cognitive processing of information and it is this type of information processing that is most likely to be associated with retention of new information and long-term changes in attitudes. The conditions of a persuasive communication that encourage mindful information processing include:

- Coverage or inclusion of topics of personal relevance or importance to the audience
- Asking the audience questions to encourage them to search for answers in the information available
- Introducing novelty or surprise
- Providing the audience with choices or decisions
- Using active mental and physical participation to encourage a search for information
- Variety in presentations

- Connecting the new information to existing schema, or to what the audience already knows.

See Screven, 1995, Moscardo, 1996 and Moscardo, 1998, for a more detailed review of these features.

Attitude behaviour links

Persuasive communication research is not just concerned with changing beliefs and attitudes. It is also focussed on changing behaviours. In terms of having an impact on conservation, it is behaviours such as the way people vote, the money they contribute to conservation projects and their own minimal impact behaviours that are critical. In general it is believed that there is a link between a change in attitude towards an object and a change in behaviour towards that object. This attitude-behaviour link is not, however, straightforward and a number of intervening variables have been determined and described (Ajzen, 1992; Baron & Byrne, 1997). Ajzen's (1992) Theory of Planned Behaviour is the most commonly used approach to understand the link between attitudes and behaviours (Baron & Byrne, 1997). According to this theory a number of variables mediate this relationship: situational constraints, skills and abilities and normative or social influences. For example a person may have an attitude that it is inappropriate to touch corals while snorkelling, but they may actually do so if they see others doing so, or they may do so accidentally because they have limited snorkelling skills. In another example, a camper may have an attitude that it is wrong to cut down trees in a National Park for firewood. But again they may do so, if no other fuel is provided or if they were not told far enough in advance that they would need fuel. Clearly an effective interpretive program may change people's knowledge of appropriate minimal impact behaviours and encourage a positive attitude towards these behaviours, but it must be part of a total management program that encourages and supports the desirable behaviour (Manfredo, 2002).

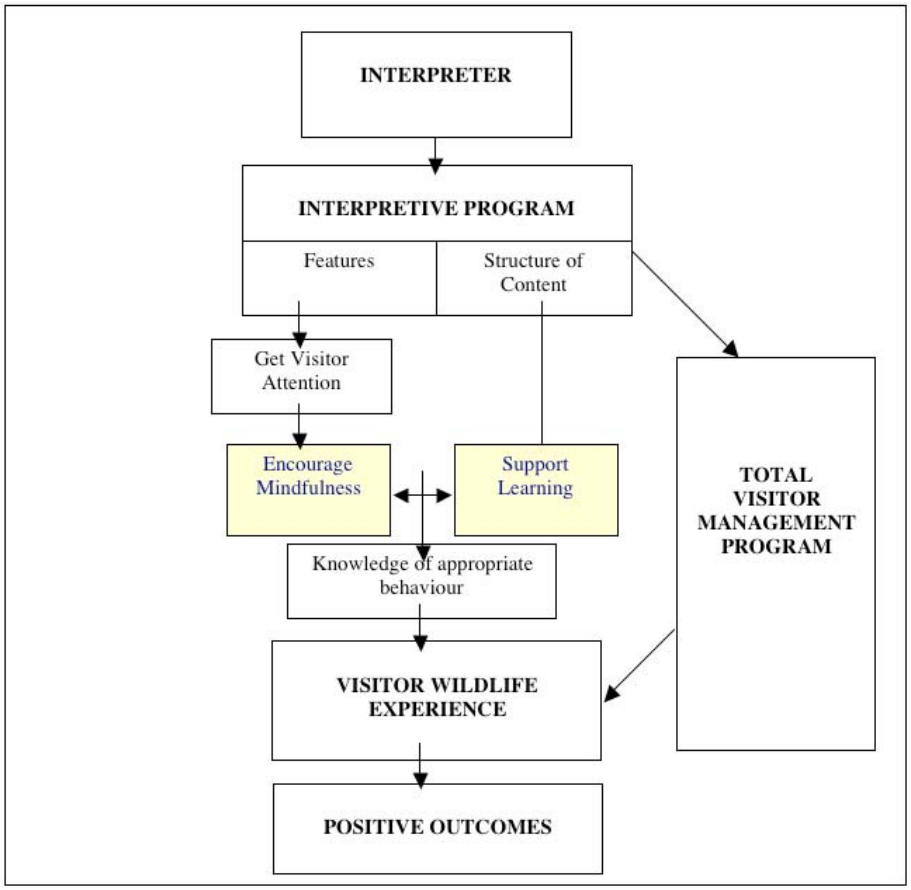
A mindfulness model of wildlife interpretation

In summary then there is a number of steps that have to be successfully completed before a wildlife interpretive program can effectively change visitors' knowledge, conservation and animal welfare attitudes, and behaviours. These are summarised in Figure 12.1. This figure is based on Langer's concept of mindfulness. Mindfulness is a cognitive state of active mental processing which allows people to learn new information, to detect and deal with problems, to take alternative perspectives on a problem or issue, to reassess and change existing cognitive structures and to be in control of their behaviours (Langer, 1989; Moscardo, 1999). Research into this state of cognition has also demonstrated that mindfulness is associated with feelings of control, interest, enjoyment and satisfaction (see Moscardo, 1999 for a review of the relevant research; see also Chapter 9 for discussion of mindfulness and its significance).

A number of steps to encourage mindful visitors and thus appropriate visitor responses to wildlife encounters are outlined in Figure 12.1. Firstly, the interpreter has to use the features of the interpretive activities to get the visitors' attention. Then the interpretive program must include features to encourage a mindful or active processing of the information provided. Thirdly, the information needs to be organised in a clear fashion so that it can be understood. Mindful processing of clearly organised, easy to follow information should then encourage visitors to behave in a minimal impact

fashion and provide them with the skills and motivation to make the most of their wildlife experience opportunity. Finally, if this effective interpretation is combined with an appropriate total visitor management program then the outcomes of the visitor wildlife interaction should be minimal impacts on the wildlife and the setting, and satisfied visitors with an increased awareness of wildlife conservation issues and actions.

Figure 12.1: Mindfulness model of wildlife interpretation and experiences



Principles for the design and use of wildlife interpretation programs

A number of principles can be set out to enhance the design and use of interpretation in wildlife tourism settings. These are based on the Mindfulness Model, the results of interpretation, evaluation, research (including the studies reviewed in this chapter and the broader literature on interpretation effectiveness not covered here) and more general psychological research. The following sections will provide an overview of each principle and some examples of their application in wildlife tourism settings. More details on these and similar principles can be found in a number of interpretive

texts (see Ham, 1992, Serrell, 1996; Beck & Cable, 1998; Moscardo, 1999; Manfredo, 2002; Pastorelli, 2003).

Make personal connections to visitors

Effective interpretation enables visitors to make connections between the information being given and their previous knowledge and experiences. This can be achieved by using clear, simple explanations to bridge the gap between new information and visitors' current knowledge. The importance of providing information and experiences that have meaning and personal value for visitors cannot be overstated. Indeed, dazzling graphics, interactive activities and educational content will count for very little if visitors are unable to make meaningful connections to their previous knowledge and experiences (Screven, 1995).

It is also clear from the comments made by visitors in survey and interview studies that being able to find or make a personal link is a major factor influencing their satisfaction and how much they feel they learn (Moscardo, 1999). These comments often include ideas for providing personal connections. These include the use of humour and analogies and metaphors to build links between the interpretive content and the everyday experience of the visitor. Visitors also appreciate the opportunity to ask questions. Another option is to give visitors information about what they can do in their everyday lives to improve wildlife conservation. A display at one end of the large cats display area at Chicago's Brookfield Zoo, for example, asked visitors to write a short note on what they think they can do when they leave to support the conservation of these animals. These notes were then attached to a large notice board so that all visitors could read and learn from other suggestions and contribute to the content of the display. This provided the visitors with an opportunity to make a direct personal contribution to the interpretation but also with links between their everyday lives and the conservation of the displayed animals.

Provide variety

Providing variety in the interpretive experiences offered to visitors is a very important way to encourage mindfulness (Moscardo, 1999). Any repetition will quickly lose visitor attention and without attention it is difficult to create successful communication. This variety can be achieved by designing wildlife interpretive programs that incorporate different media, for example, audiovisual presentations, models, displays, and objects such as casts of animal prints and skulls and feathers and skins. Guides can also vary the level of physical and mental effort required by combining some active components with quieter, contemplative activities. A wildlife cruise from Seward in Alaska provides an example of building variety into the experience for visitors. On this tour, visitors were given an information pack about the tour on boarding to read while waiting for the tour to begin. They were then given a series of short talks by different crew members based on various aspects of the environment and the wildlife that were likely to be seen. During the main part of the cruise a number of different wildlife examples was pointed out and discussed in an ongoing commentary, but this was punctuated by suggested activities and the passing around of different objects, such as skins and casts of skulls, related to the animals being seen. There was variety in the media used, the staff in charge, the pace of the tour and the senses used by the visitors.

Have well-structured content based around themes

To facilitate visitor learning and comprehension, interpretive information should be presented in a clear, logical order with an introduction that provides visitors with an overview of the topics or activities to follow (Screven, 1995; Moscardo, 1999). The main body of the interpretive program should then follow this introduction with information organised around a single main theme. Effective themes are specific, attract visitor attention, stimulate interest and enable visitors to make important connections between their experiences and the feature being interpreted (Ham, 1992; Serrell, 1996; Pierssene, 1999). Information in this main section can be presented using a variety of communication techniques such as analogies, comparisons, examples, metaphors, anecdotes and graphic illustrations. The conclusion reinforces the messages and concepts discussed and should include a 'take home' message that informs visitors how they can take positive actions to support wildlife conservation when they return home (Ham, 1992).

Be part of an overall management plan

Finally any interpretation program should be developed as part of an overall visitor management strategy so that it reinforces desirable visitor behaviours and so that it is in turn supported by the other features of the setting (Manfredo, 2002; see Chapter 11). Matt and Aumiller (2002) provide an example of this in their description of the development of brown bear viewing areas at McNeil River State Game Sanctuary in Alaska (see also Chapter 11 for another discussion of the management issues in this case). In 1973 a permit system was instigated to begin to manage increasingly negative confrontations between visitors and bears. The agency staff were given the responsibility of managing aggressive bears and began to determine and research the human actions that resulted in negative consequences both to, and from, the bears. Out of this experience grew a set of objectives related to providing safe and close contact between bears and visitors supported by appropriate minimal impact behaviours and infrastructure. One of the ways to achieve these management objectives was to develop a good fit between the type of visitors that were attracted to the area and the type of experiences provided in terms of minimal impacts on the bears. In addition to establishing campaigns to properly inform potential visitors about the Sanctuary, the management agency also developed a detailed visitor interpretation program that supports other management actions and rules. In addition the total management system relies upon monitoring and evaluation and the involvement of several stakeholder groups in management decisions (Matt & Aumiller, 2002, see Chapter 11).

Future directions

Although there is not a large body of scientific literature on the effectiveness of different techniques, structures and contents in wildlife interpretation, one consistent finding is that interpretation is a critical component of visitor experiences and satisfaction. In addition, there are examples of programs that have been successful in changing visitors' levels of knowledge and understanding of the wildlife, their conservation and animal welfare attitudes and their behaviours both during the encounters with the wildlife and when they return home. What is not clear are the finer details such as the relative merits of using anthropomorphic interpretive approaches, or the effectiveness of interpretation in raising the awareness and popularity of

unknown or disliked species. One important future direction then is the need for more systematic evaluations of current and potentially new interpretive programs and activities.

The available evidence does, however, show considerable consistencies with what has already been learnt from interpretation of other topics and in other settings. Thus it seems reasonable to argue that the principles set out above are sound and wildlife managers and tourism operators dependent upon wildlife encounters should explore the extent to which their current practices are consistent with these principles. A growing number of textbooks, manuals and guides for the effective planning, design and use of different interpretive techniques is now available and it seems wise to suggest that many of those currently involved in wildlife interpretation should be continually seeking to update their knowledge and skills in this area.

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Chapter 13

Wildlife Tourism: A Strategic Destination Analysis

Karen Higginbottom and Noel Scott

In Chapter 1, Higginbottom suggested that a minimum goal for planning of wildlife tourism should be to achieve economic, social and environment sustainability ('Triple Bottom Line Sustainability': Elkington 1997), and that a further goal might be to maximise the net benefits of wildlife tourism to society. But what can stakeholders in wildlife tourism do to achieve this? Parts 1 and 2 of this book have provided a status assessment of wildlife tourism, including its potential negative and positive impacts in relation to the key elements of sustainability (wildlife, host communities and economics). Part 3 has provided some directions on how wildlife tourism can be designed and managed to enhance benefits for each of these elements, as well as for tourists. In this final chapter, we synthesise lessons from previous chapters and add some new perspectives to propose ways to facilitate enhancement of net benefits from wildlife tourism. The first part of the chapter reviews some general themes that emerge from previous chapters, leading into discussion of why a destination based strategic planning process is desirable and how it should be conducted. The second half of the chapter discusses strategic issues in wildlife tourism and suggests how these can be tackled within the framework of this process. To illustrate some of these points we describe some preliminary strategic planning initiatives that adopt some of these principles, and thus may help provide inspiration and further lessons.

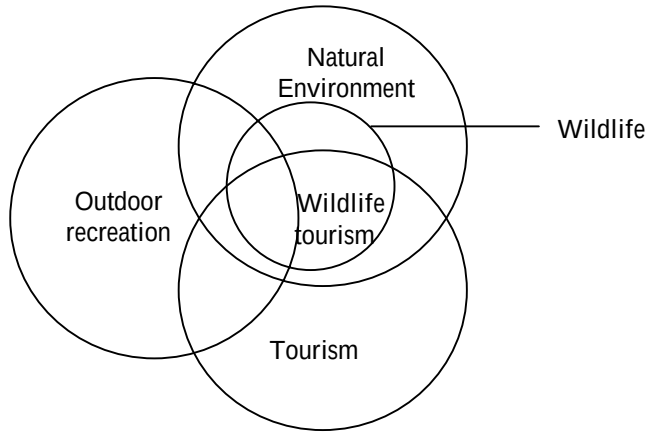
A holistic perspective on wildlife tourism

The previous chapters have shown that a holistic understanding of issues relating to wildlife tourism requires it to be seen within a society-wide context, rather than as just a form of tourism (Figure 13.1). Wildlife watching, viewing wildlife in captivity, hunting and fishing are all important recreational activities that do not necessarily involve the commercial tourism industry. In a non-tourism context the aim of planning and management is usually to provide quality visitor experiences and to manage the wildlife sustainably, and sometimes to provide appropriate education (Chapters 2,3,4). When commercial tourism is superimposed on this situation, these issues are still important, but financial viability of tourism-related businesses becomes critical, and impacts on host communities (positive or negative) may also become more significant (Chapter 7). This book has drawn on a range of disciplines and perspectives to reflect this holistic approach. These disciplines have included wildlife ecology, biogeography and management, tourism and business management, recreation management, anthropology, psychology and economics.

Much of the content of this book has drawn on the literature relating to wildlife-related recreation, and in some cases on recreation management in general. This is due to there often being more experience and information available on recreational than tourism aspects (as in North American wildlife watching) and because in any case many of the issues are the same for wildlife-related recreation and wildlife tourism.

Similarly, some lessons relating to the management of wildlife for wildlife tourism can be extrapolated from knowledge of general human impacts on wildlife (Chapters 5 and 6) and natural resource management (Chapter 11). Again, this is often necessary because there is very little literature focusing specifically on management of impacts of wildlife-tourism on wildlife.

Figure 13.1: The context of wildlife tourism. Tourism is presented as separate from but overlapping with recreation, as it involves additional elements such as accommodation.



Even as a form of tourism, wildlife tourism should not be viewed in isolation. Particularly in the case of wildlife-watching tourism, aspects of a visitor experience that relate to wildlife are often combined with other elements of the natural environment (Chapters 1, 2) and may also be combined with cultural, adventure or other forms of tourism. Indeed, for example, there may be unrealised opportunities for integrating wildlife tourism and cultural tourism, in ways that enhance the visitor experience of both elements (see Chapter 7 and Muloin et al., 2001).

Nevertheless, issues have been presented in this book that are specific to the use of wildlife in tourism. These are principally:

- The market and demand for wildlife tourism (Chapter 9)
- Presentation and management of wildlife to enhance its suitability for tourism (Chapters 2,3 and 11)
- Wildlife tourism product design (briefly addressed in Chapters 2,3,6,9,12)
- Interpretation issues specific to wildlife (Chapter 12)
- Economic benefits associated with wildlife tourism (Chapters 1,8)
- Impacts on wildlife that are particular to the nature of wildlife tourism interactions (Chapter 5) and related management measures (Chapter 11)
- Contributions of wildlife tourism to wildlife conservation (Chapters 3,4,6)
- Impacts of wildlife tourism on host communities through interference with existing uses of wildlife (Chapter 7)

- Public attitudes to wildlife tourism, and to wildlife where this impinges on wildlife tourism (Chapters 3,4,6 and 7)

There is very limited information on most of these issues, and we suggest that they be the focus of future research to better inform future planning, design and management of wildlife tourism.

Most of the above issues apply to all forms of wildlife tourism (wildlife watching, viewing wildlife in captivity, consumptive wildlife tourism). However there has historically been little communication between stakeholders involved in these different forms, and they have rarely been addressed together in previous literature. Although the 'answers' relating to each of these issues may differ somewhat between forms of wildlife tourism, strategic planning in relation to the role of wildlife in tourism should include simultaneous consideration of the various forms. For instance, decisions may need to be made about parts of natural areas in which hunting as opposed to wildlife watching should be encouraged, or it may be useful to consider jointly how to design and present conservation education in zoo and wildlife-watching situations. Further, there may be benefits to be gained by closer cooperation and communication between these historically disparate forms. For example, zoos may generate visitor interest in tourism experiences with animals in the wild (Chapter 3), wildlife tour operators may be able to gain ideas about wildlife interpretation from zoo exhibits (see Chapter 12), or there may be demand in some regions for packages combining hunting with wildlife watching. We suggest that increased coordination between the different forms of wildlife tourism would raise a number of opportunities for enhanced economic and conservation benefits.

Current status of wildlife tourism

Wildlife tourism has evolved dramatically over recent decades (Chapters 2,3,4). Key identifiable trends over this period are given in Box 13.1.

Box 13.1: Trends in international wildlife tourism

- Increased involvement of the commercial tourism industry
- Increased levels of participation in (at least some forms of) wildlife watching tourism (Chapter 1,2)
- Diversification of wildlife watching opportunities – wider range of environments, target species and types of activity/ product (Chapter 2).
- Increased consideration of animal welfare issues (Chapter 3)
- Increased environmental awareness (although it is unclear whether this translates into demand for environmentally responsible tourism) (Chapter 9)
- Increased sophistication in product design (Chapter 9)
- Increased use of interpretation, especially in captive settings (Chapter 12)
- Increased use of technology to facilitate wildlife viewing (Chapters 2,3)
- Some blurring of the distinction between captive and free-ranging wildlife tourism (Chapters 1,3)

Additional sources: Shackley (1996; 2001), Manfredo (2002), Higginbottom et al. (2001)

Previous chapters of this book have shown that wildlife tourism can provide significant benefits to economies, especially in rural areas (Chapters 1, 8), as well as to wildlife (Chapters 3, 4, 6), visitors (Chapter 9) and host communities (Chapter 7).

They have also indicated that there is potential for these benefits to be increased, and that, on the other hand, wildlife tourism sometimes leads to costs to wildlife (Chapter 8) and host communities (Chapter 7). If wildlife watching continues to grow, as recent trends might suggest, and if this occurs without improvements in management and monitoring of wildlife tourism, these costs are also likely to grow. Thus, in order to promote ways to enhance benefits and minimise costs of wildlife tourism, we propose that destinations should employ a strategic approach to its future development and management.

Need for strategic planning of wildlife tourism

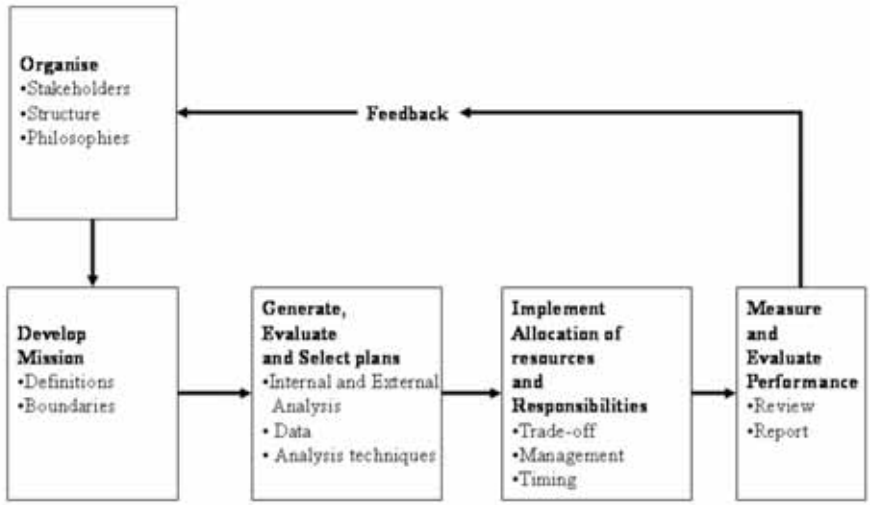
Wildlife tourism comprises a very diverse range of products (Chapters 1-4) and many of these incorporate non-wildlife tourism elements in the experiences they provide to customers (Chapters 1 and 2). As shown above, there are many issues that are specific to wildlife tourism and that apply widely to its various forms. The diversity of products, issues and stakeholders involved has however meant that there has generally been little attempt to analyse these issues strategically and in a coordinated way across this diversity. If Triple Bottom Line sustainability of wildlife tourism is to be enhanced, and net benefits to stakeholders are to be increased, then we suggest there is a need for coordinated approaches that analyse the issues in a strategic way and facilitate future planning.

The literature on strategic planning provides guidance for such an approach. Strategic planning and management involves 'formulating, implementing and evaluating cross-functional decisions that enable an organisation to achieve its objective' (David, 1995). Thus strategic planning is integrative across different parts of an organisation or, in the context of wildlife tourism, across organisations with different functions. It also involves development of a longer-term vision as to what is to be achieved by these integrated planning operations and resulting decisions. The earlier chapters have illustrated the current fragmented nature of relations between the many organisations, both commercial and non-commercial, that are involved in wildlife tourism. These include principally tourism operators, members of the travel trade, various tourism-related associations, government wildlife or protected area management agencies, government tourism agencies and conservation NGOs (see Chapter 10). Generally, developing a coordinated and strategic approach requires some mechanism for encouraging communication between stakeholder organisations, consideration of diverse perspectives and joint action on issues. We contend that use of a strategic planning process will encourage and support stakeholder integration and lead to more sustainable outcomes.

A strategic planning process for wildlife tourism

A commonly accepted strategic planning process is given in Figure 13.2. Similar frameworks have been proposed in the wildlife management context (e.g. Decker et al., 2001: p.78). The process may consist of a number of discrete stages, although in practice development of strategy often occurs in a less structured manner than illustrated. The diagram highlights the circular nature of planning.

Figure 13.2: Strategy development process (after David, 1995: p 14.; Goeldner et al., 2000: p 470)



As shown in Figure 13.2, development of a strategic approach involves defining and bounding the mission to be undertaken, in the process identifying stakeholders and their roles and philosophies regarding wildlife tourism. A process then needs to be followed to ensure that any organising initiative is not a 'toothless tiger': this requires identifying, analysing, prioritising, solving and then implementing solutions that address the various issues facing wildlife tourism.

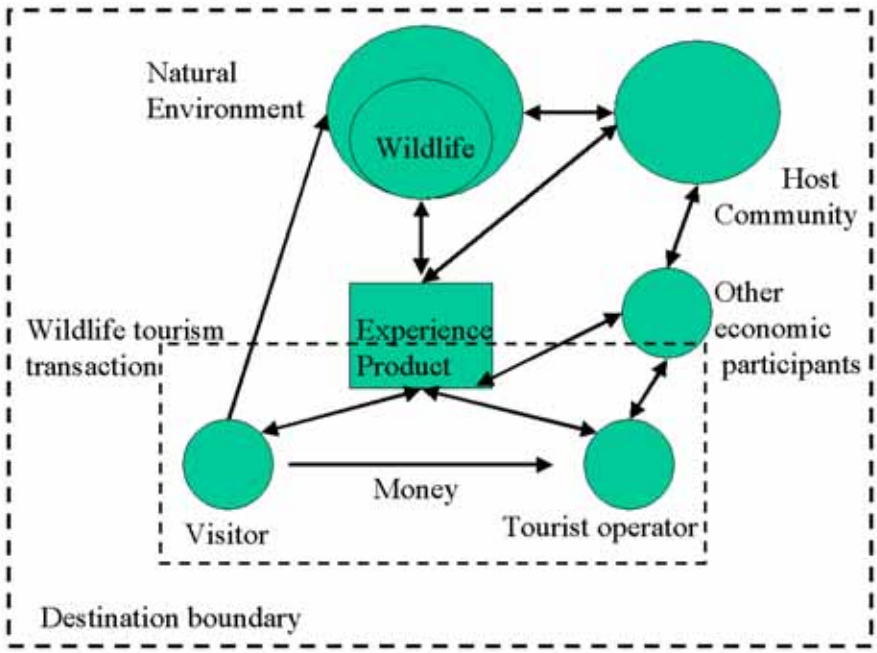
Defining and conceptualising wildlife tourism

Developing an appropriate conceptual framework, which ensures that all key issues are included and that their inter-relationships are adequately recognised, can aid the process of strategic planning. Firstly, as for tourism generally, this framework should include consideration of an economic transaction and associated supply and demand issues. Many of the discussions in chapters of this book revolve around the impact of economic transactions involving a 'common good' resource: animals. Secondly, the framework should allow the natural environment and host community to be examined in a manner that demonstrates the potentially positive or negative effects of the interaction and reflects the importance of these components of the system (as demonstrated in Chapters 5, 6, 7 and 8). Thirdly, it should emphasise the extended nature of the wildlife tourism product, including complementary products. Like tourism products generally, wildlife tourism involves a package of related goods including other tourism attractions, transportation and accommodation. Fourthly, an inclusive framework should recognise the geographical particularity of wildlife tourism. Both the tourism and the wildlife component of the wildlife tourism experience are affected by the interaction of unique regional ecology, local communities and economics. Finally, the framework should acknowledge that much wildlife tourism is not mediated (or at least not directly so) by members of the

commercial tourism industry, but is nevertheless important in terms of economic benefits to regions and benefits (or costs) to wildlife, host communities and visitors.

Thus we propose developing a holistic approach, building on the conceptualisation introduced in Chapter 1 (Fig. 1.1), where the relevant components of the wildlife tourism transaction system, the wildlife/ natural environment and the host community are all included (see Fig. 13.3). This way of looking at the system allows the planner to emphasise that the overall goal is for all flows between components to be positive (or at least neutral), and for maximum benefits to be generated for each of these elements. It also allows the user to readily focus on those strategic aspects that require attention. However we recognise that conventional types of conceptualisation that focus on commercial transactions (and treat the natural environment and host community as 'external influences' on the supply side) are also of value in tackling more specific tourism and business issues. Clearly the most appropriate framework to be used for any analysis depends on the organisation(s) or stakeholder(s) involved. In this discussion, we seek to provide common ground for previously divergent discussion.

Figure 13.3: The wildlife tourism system: a model to assist in strategic planning for wildlife tourism



Planning boundary

In planning for tourism, the usual unit of analysis is the destination (Plog, 1974; Cooper & Jackson, 1989; Laws, 1995; Cho, 2000). Tourism destinations can be defined at a number of geographic scales, from a particular site or resort to a city, region or country (Laws, 1995, pp. 23-5; Formica and Uysal, 1996). A destination is distinct from a transit place or a periphery: it is a place where tourists choose to visit and spend a significant proportion of their time (Gee et al., 1984). Because of this,

tourists require accommodation, food, activities or entertainment, as well as other support services such as transportation. Additionally, the provision of these services in any volume requires numerous people to be employed in providing these services. Indeed the presence of a local community, with its culture and heritage, is often part of the tourist experience. Similarly, in many destinations the natural environment and scenery provide key components of the tourism experience.

It is this interaction between the various individual components of tourism (transport, accommodation, etc), conducted in sufficient volume to be economically viable, that creates the need for some process of strategic planning for a destination. This general aim of this process is typically to develop a sustainable tourism destination (see Chapter 1), and in doing so it needs to involve the local community and environmental managers. Tourism destination planning is therefore distinct from land use or environmental planning and management. Essentially, it involves consideration of all aspects of human activities that have the potential to affect the sustainability of a tourism destination (Cooper, 1992; Tosun and Jenkins, 1996; Dredge, 1999; Hall, 2000; Pforr, 2001). This approach recognizes the synergy that exists between the qualities of a destination's environment and the attractiveness of that destination to tourists (Murphy et al., 2000; Mihalic, 2000).

Destination strategic planning is not only logical, but necessary for destination planning in order to respond to increasing competition between tourism destinations around the world (Cooper, 1990; Kozak and Rimmington, 1999; Antunes, 2000; Ritchie and Crouch, 2000). Types of tourism such as cultural tourism, major events tourism and nature-based or wildlife tourism are increasingly being used to create or enhance the competitiveness of destinations. Within wildlife tourism, there are safari destinations, whale-watching destinations, fishing destinations, bird-watching destinations and so on. Clearly there is variation in the extent to which wildlife is a factor in the choice of a tourist destination. However in many destinations, the visitor will experience wildlife, and this may either enhance or detract from the overall visit. A strategic approach to wildlife tourism seeks to enhance the overall wildlife interaction for all parties (including the wildlife). While a strategic planning approach has been applied to wildlife management in various regions (Curran, 1993) there has been virtually no previous discussion of wildlife tourism from this perspective. In this chapter we draw together the various issues raised in other chapters in a strategic destination framework.

This destination approach to wildlife tourism fits well with the geographic aspects of wildlife ecology. Many species that are the object of wildlife tourism are restricted to a certain geographical region, dictating the geographical extent of the associated form of wildlife tourism. Some are found only in a few particular locations within a country (e.g. giant panda); some are widespread in a particular country (e.g. koala); others occur in many different parts of the world (e.g. various species of whale). The first type of species particularly suits tourism, as most tourism development strategies are organised by regional destination (Hope and Klemm, 2001; Pechlaner and Sauerwein, 2002). Thus some aspects of planning relating to tourism based on species with very restricted distributions are best discussed using a regional unit of analysis.

However in terms of wildlife tourism policy generally, and especially in terms of the common issues across different types of wildlife tourism experiences, we propose that there is also a need for strategic planning of wildlife tourism at a national level. At this level it is possible to look at common issues applying to many different types of

wildlife tourism interaction and to consider these different types as a whole. This approach accepts that wildlife tourism is not one product but consists of a variety of different products, each with distinct characteristics as an experience and also with different types of customers. In marketing terms, wildlife tourism may be considered a portfolio of individual product markets.

Identifying and organising the stakeholders

One of the biggest challenges in planning for Triple Bottom Line sustainability of wildlife tourism is the wide range of stakeholders involved, all with different aims (see Chapter 1) and operating at varying scales. Wildlife tourism may be considered against a hierarchy of scales, including international, national and regional. At the international level, a number of organisations have developed agreements and policies that impact on wildlife tourism. International agreements and policies on environmental and wildlife issues can affect the viability of wildlife tourism, such as the Convention on Biological Diversity, the IUCN Red List of Threatened Species, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and schedules to the International Convention for the Regulation of Whaling. This can happen either by increasing or decreasing the availability of animals to tourism, and by drawing public attention to particular species and so affecting visitor demand. Similarly, there is a number of international organisations that provides policy for the tourism sector such as the World Tourism Organisation, World Travel and Tourism Council, sectorial bodies (such as those involved in transportation) and organisations such as ASEAN and the European Union. At national and regional levels, wildlife tourism is affected by the particular environmental, social and economic factors that apply at those levels. In most national and regional jurisdictions there are currently no organisations or organised initiatives that cover most of the scope of issues discussed in this book, and that ideally needs to be addressed to achieve sustainability of wildlife tourism or wildlife watching. Thus we propose that there is a case for developing some organised structure or process to facilitate links between existing organisations and to address strategic issues that cut across the scope of those organisations.

Organising can occur informally – through meetings such as conferences, or informal networks – or it can be facilitated by a formal organisational structure. Informal initiatives are likely to have relatively low political credibility, and tend to rely on the efforts of particular individuals who may not continue to be available. An example of this approach was the Sustainable Wildlife Tourism Convention held in Hobart, Australia in 2001 (Higginbottom, 2001). It brought together a range of mainly Australian stakeholders to discuss diverse issues relating to sustainable development of wildlife tourism and its integration with conservation and generated recommendations. These were forwarded to government ministers and departments, but there were no significant mechanisms or personnel to exert political influence. Thus we suggest that (particularly at national levels) an organisational structure dedicated to wildlife tourism, or an initiative on wildlife tourism, facilitated by a suitable existing organisation, is likely to be the best means to advance its sustainability.

Although it is a recent development, a few organizations, at national levels, have been established to oversee or facilitate development of wildlife tourism, wildlife watching or wildlife-related recreation. (Table 13.1). There is also a range of

international and national initiatives relating specifically to zoos and hunting, some of which have been discussed in Chapters 3 and 4 respectively. The establishment of the latter organisations has been useful in providing political representation, promoting standards particularly in regard to animal welfare issues, promoting and guiding involvement in conservation and facilitating alliances with other organisations. However these organisations have had little involvement in tourism issues. There are also organisations focusing on a particular group of animals that address some tourism-related issues (e.g. Whale and Dolphin Conservation Society, African Wildlife Foundation, Birds Australia), but again none of these has a tourism focus.

Table 13.1: Organisations/programs established to facilitate strategic initiatives in wildlife tourism

Program/ Organisation	National Watchable Wildlife Program (USA)/ Watchable Wildlife Inc. (non-profit organisation)	Canadian Tourism Commission Product Clubs	Wildlife Tourism Australia	Scottish Wildlife and Nature Tourism Operators Association
Year initiated	1990	1996	2002	2003
Main stakeholders/ members involved	Government land management/ conservation agencies (state and federal), non-government conservation groups, local communities, and business and industry participants. MOU signed between federal and state wildlife agencies, as well as several wildlife non-profit organisations.	Canadian Tourism Commission, tourism operators, local and state government organisations, NGOs.	Wildlife tourism operators, government land management/ conservation agencies (state and federal), non-government conservation groups, researchers (including links to major wildlife tourism research program).	Wildlife and nature tourism operators, with support from the Tourism and Environment Forum (a partnership of public and private organisations) and government. Indirectly linked with an initiative by VisitScotland (government agency) for enhanced focus on marketing of wildlife tourism.
Scope of interest	Wildlife watching (free-ranging native animals), especially terrestrial. Commercial tourism and wildlife-related recreation by residents and tourists.	Ecotourism-related tourism products.	Wildlife tourism in general, with a focus on commercial tourism and native Australian animals.	Commercial wildlife watching and captive wildlife tourism, terrestrial and marine, with focus on Scottish fauna. Nature-based tourism with wildlife as flagship or focus.
Goals	1. Providing enhanced opportunities for the public to enjoy wildlife on public and private lands. 2. Contributing to local economic development. 3. Promoting learning about wildlife and habitat needs. 4. Enhancing public support for resources conservation.	1.Commercial success 2. Sustainability Generally seek to involve local participants in the joint development of tourism products that are both profitable and sustainable.	Mission: To promote the sustainable development of a diverse wildlife tourism industry that supports conservation.	Overall aim (draft): encourage the commercial operation, development and promotion of wildlife and nature tourism in Scotland in ways that are sustainable environmentally, economically and socially.

Main initiatives to date	1. Supported development of a network of wildlife viewing areas that incorporate interpretation. 2. Produced a set of wildlife viewing guides (now available for more than half of American States) 3. Set up a communication network, including national conferences.	Two initiatives focused specifically on wildlife: the Bay of Fundy initiative (involves the provinces of Nova Scotia and New Brunswick promoting rare marine wildlife and an abundance of other wildlife, as well as other natural features) and The Conservation Lands of Ontario initiative (where government environmental agencies offer ecotours).	1. Developed website. 2. Held national workshop. 3. Provided input into tourism policy and accreditation program development. 4. Established task groups to work strategically towards organisation's objectives.	New organisation, but has identified priority actions as: auditing codes of conduct, developing business plan/ marketing plan, branding, developing website.
Source	Watchable Wildlife Incorporated 2003; USDA Forest Service 2003; J. Herron, Branch Chief, Wildlife Diversity, Texas Parks and Wildlife, July 2003, pers. comm.; R. Garrison, Nature Tourism Planning (consultants), California, October 2003, pers. comm.	Pam Wight & Associates 2001		C. Warburton, Coordinator, The Tourism and Environment Forum, June 2003, pers. comm..

A formal organisational structure or initiative can occur as part of the work of existing government departments. Alternatively, it can be developed by a non-government organisation or an alliance of organisations. Key advantages of the former approach are that any initiatives can be expected to translate fairly readily into changes in policy and legislation, and that there is likely to be at least a moderate level of resourcing. Thus, a wildlife tourism plan has been developed by Tourism Tasmania (the government tourism agency for the Australian State of Tasmania) and is now being more comprehensively developed into a wildlife tourism strategy (S. Lennox, Tourism Tasmania, October 2003, pers. comm.). The Canadian Tourism Commission Product Clubs described in Table 13.1 also fall into this category. A potential drawback is that such plans may be limited in scope because of their development by a single government department, and in some cases may be unduly restricted by government policy and procedures. The holistic nature of wildlife tourism policy challenges departmental boundaries and requires an inclusive and effective process for stakeholder participation if it is to gain wide public acceptability. The development of Australia's National Ecotourism Strategy by the Commonwealth Department of Tourism (1994) was widely acknowledged as inclusive due to its adoption of a comprehensive consultation process, and involved a substantial financial commitment for the development of the strategy and for its implementation (Grant and Allcock, 1998). It has had a significant role in strategically guiding development of nature-based tourism in Australia, but addressed national policy issues rather than guiding industry development, as we are suggesting here.

If an inclusive, effective government-led process is not in place, then development of an organisational structure and strategy driven by non-government stakeholders (with or without government involvement) may be desirable. In the case of wildlife

tourism, key stakeholders are likely to be either conservation groups (as in the National Watchable Wildlife Program; see Table 13.1) or wildlife tourism operators (as in Wildlife Tourism Australia and Scottish Wildlife and Nature Tourism Operators Association; see Table 13.1), and any such initiative will reflect the perspectives of the organisations involved (see next section). Assuming there is sufficient interest from stakeholders, the key obstacle is likely to be obtaining sufficient funding for effective operation (see later section on overarching issues). Cost saving may be achieved by embedding the initiative within a wider organisation (such as a tourism or ecotourism industry association), but the issues that are specific to wildlife tourism are then less likely to achieve significant attention, and the larger organisation may not cover the scope of issues of interest. In particular, wildlife watching has in the past been only partially dealt with under the banner of ecotourism or nature-based tourism or by related organisations, and recognition of this has contributed to formation of the organisations in Table 13.1.

Linked with establishing an organisational structure is identification of, and obtaining cooperation of key stakeholders. The organisations in Table 13.1 differ in their stakeholder composition, as a result of different histories of formation. The National Watchable Wildlife Program (now formalised into the non-profit organisation Watchable Wildlife Inc.) was driven primarily by government wildlife agencies in the early stages, with involvement from non-government conservation groups in recognition of common conservation goals. There has however been little involvement of the commercial tourism industry or government tourism agencies, except at the level of local rural communities seeking to diversify their economies (R. Hernbrode, Former Watchable Wildlife Coordinator, Colorado Division of Wildlife, July 2003, pers. comm.; R. Garrison, October 2003, pers. comm.). Wildlife Tourism Australia evolved as a flow on from an applied research program on wildlife tourism by the Cooperative Research Centre for Sustainable Tourism, which involved extensive liaison with a range of stakeholders, especially from the tourism industry and a government tourism agency (Tourism Tasmania) (see Higginbottom et al., 2001). Formation of the Scottish Wildlife and Nature Tourism Operators Association was driven by tourism operators, with support from the Tourism and Environment Forum, a partnership of public and private organisations, and from public agencies (C. Warburton, June 2003, pers.comm.). Research by the Tourism and Environment Forum indicated the importance of wildlife tourism to Scotland (A&M Training and Development 2002), helping trigger increased interest by various stakeholders, and a subsequent conference and meetings organised by this group provided an opportunity for joint action (C. Warburton, June 2003, pers. comm.).

Developing the Vision and Mission

The goals (and/or an associated vision or mission statement) of key organisations associated with wildlife tourism (Table 13.1) have some common elements. In chapter 1, Higginbottom suggested that appropriate goals for wildlife tourism (consistent with international agreements) should reflect sustainability principles and preferably should refer to maximising relevant benefits for wildlife/ natural environment, visitors, host communities, and tourism-related businesses. All the organisations listed in Table 13.1 are generally consistent with this approach in that they state or imply sustainability in their goals, and include both economic and conservation aspects. They vary in terms

of the forms of wildlife tourism included and in the relative emphasis on tourism as opposed to recreation by local residents.

To obtain a wider selection of perspectives regarding what should be achieved by wildlife tourism, we contacted a range of tourism and conservation-related organisations (Box 13.2). Again ecological, economic and social sustainability are the main themes, with the relative degree of emphasis on each depending on the focus of the organisation. The goal of using wildlife tourism to support wildlife conservation also features prominently among conservation-related organisations. Interestingly, conservation organisations were more likely than tourism organisations to be willing or able to provide visions that related specifically to wildlife tourism.

Box 13.2: Visions of selected organisations for wildlife tourism

The following responses were obtained in response to the question 'What vision does your organisation have for the future of wildlife tourism?' addressed to the most appropriate senior person in each organisation by email. The respondents were told that by wildlife tourism, we meant 'tourism based on non-domesticated animals (including wildlife-watching, zoos, hunting and fishing)'.

Pacific Asia Travel Association (PATA)

PATA has no specific vision for wildlife tourism, but in answer to this question referred to the APEC/PATA Code for Sustainable Tourism, which includes the objective to: 'Conserve the natural environment, ecosystems and biodiversity' (P. de Jong, President and CEO PATA, September 2003, pers. comm.). PATA's mission is 'to enhance the growth, value and quality of Pacific Asia travel and tourism to benefit PATA members'. Its objectives are to 'encourage and assist in the development of travel industries throughout Pacific Asia in a manner which recognises the urgent importance to practice an environmental ethic that supports responsible conservation and restoration of Pacific Asia's unique combination of natural, social and cultural resources.' (Article IV of the PATA's Charter).

Green Globe Asia Pacific

'Green Globe's core aim is to enhance the sustainability of the world's tourism industry. It does this by providing a simple certification system to ensure tourism enterprises and destinations improve their environmental and social performance – it focuses on outcomes. Green Globe's vision for wildlife tourism is that every wildlife tourism enterprise measures and benchmarks its sustainability performance and makes improvements year upon year, ensuring minimum impact on wildlife and maximum benefit to local communities' (T. de Lacy, Board Director, Green Globe Asia Pacific, November 2003, pers. comm., www.GreenGlobe21.com)

Tourism Tasmania (Australian state government tourism agency)

A wildlife tourism project conducted by Tourism Tasmania developed the following (unpublished) vision: 'To establish Tasmania as a world class wildlife destination by identifying and facilitating the sustainable development and management of wildlife tourism'. This will be updated as part of current strategy development for wildlife tourism by Tourism Tasmania.

(S. Lennox, Tourism Tasmania, September 2003, pers. comm.)

The Nature Conservancy (international)

'Wildlife focussed tourism should ideally conform to ecotourism as defined by the IUCN.It should be seen as a strategy for reducing threats to biodiversity and contributing to conservation finance while involving local people in the economic benefits it generates. If wildlife tourism takes place with the necessary tourism impact monitoring capacity in place and properly funded, and it finances conservation management at least to the degree that it covers the costs imposed

by it on protected area management, then it will likely have a central role in contributing to conservation into the future especially in southern and Eastern Africa.'

(A. Drumm, September 2003, pers. comm.)

International Fund for Animal Welfare (international)

'In all of our efforts to promote responsible ecotourism, IFAW is motivated by a commitment to championing solutions to pressing conservation challenges that benefit animals and people. Responsible ecotourism offers superior educational, economic and social benefits to commercial consumptive use of wildlife. IFAW recognises ecotourism as a means to end short-sighted, unsustainable consumption of wildlife and wildlife products that ultimately threatens wildlife and human well being.'

(D. Boyd, Acting Asia Pacific Director, IFAW; November 2003, pers. comm.) See www.ifaw.org

Conservation and Land Management, Western Australia (government agency)

CALM does not have an official vision for wildlife tourism, but refers to Section 41.5 of their Recreation, Tourism and Visitor Services Policy, current in 2003, which states as part of its policy guidelines that 'Opportunities for viewing wildlife in their natural environment will be provided where this can be done safely and without undue disturbance to the species being observed or their habitat'. The policy guidelines also stress the use of interpretation and include guidelines to minimise any negative impacts of viewing on wildlife.

(C. Ingram, CALM; October 2003, pers. comm.)

Strategic issues in wildlife tourism

While the issues facing wildlife tourism in different regions and countries obviously vary, certain issues seem to apply widely. In the next few sections, we draw together information and recommendations from previous chapters and from the small number of reasonably comprehensive reviews from particular countries (particularly Higginbottom et al., 2001 for Australia; A&M Training and Development, 2002 for Scotland; Manfredo, 2002 for USA and Canada) to discuss key directions for wildlife tourism.

First we consider how to develop competitive destinations for wildlife tourism. In the subsequent four sections (following the framework presented in Fig. 13.3) we consider issues relating to the economic system, the wildlife and natural environment, the host community and finally, some overarching issues that cut across these elements. In terms of tourism planning, we suggest that many of these issues can best be dealt with at the level of destination regions, being used to create competitive advantages for those regions. Others, particularly where they relate to national policies and other initiatives that impinge on wildlife generally, may be better addressed at the national level. The points raised in these sections may provide ideas for preparation of a strategic wildlife tourism plan, or for a less formal strategic planning approach.

Developing competitive destinations for wildlife tourism

We have proposed that a destination focus for the development of wildlife is useful and effective. But is it currently occurring? There have been relatively few coordinated attempts to promote wildlife tourism in particular countries or regions, with some notable exceptions. Historically, these involve some countries in eastern and southern Africa, and there have been more recent initiatives in parts of Canada (e.g. HLA consultants et al., 1990) and in Scotland. In the latter case, a government

marketing initiative is being developed that focusses on wildlife tourism, and this has been reflected in dedication of a full-time staff member to its promotion (C. Warburton, June 2003, pers. comm.; N. Black, VisitScotland, September 2003, pers. comm.). Many countries or states/provinces have, however, used images of certain iconic wildlife species to help sell the national destination – or at least nature-based aspects of that destination – to international tourists, particularly in less developed countries such as India (tiger), China (greater panda), Costa Rica (tropical birds or monkeys) and Sabah Province of Indonesia (orang-utan). Even advertising material for Canada (bears) and Australia (koalas and kangaroos) often features well-known wildlife. Generally, however, this has not translated into a focus on wildlife in terms of product development or planning. At the same time countries such as Australia have strong associations with nature-based tourism and heavily promote this association in international markets.

From an economic perspective, development of wildlife tourism to capitalise on this strong association between wildlife and destinations requires tapping into the tourism system. It requires marketing and promotional activities that stimulate and shape demand as well as the development of accommodation, transportation and many other services that are required to meet that demand. In many destinations it is a lack of these services that is the main determinant of number of visitors (Croft, 2000; Akama and Ondimu, 2001).

Thus, one potential approach to promote development of wildlife tourism is to link particular wildlife with particular destinations. This allows the development a destination image based on the attractiveness and scarcity value of particular wildlife species. Many of the issues of wildlife tourism and biodiversity conservation are local or regional in nature (Wells, 1998; Kulindwa, 2002). Creation of a differentiated position for a destination based on wildlife encourages not only economic development, but also social and environmental sustainability. A destination that can offer tourists something unique provides the basis for successful tourism operations and encourages operators in that destination to see the value in preservation of the basis of their ongoing businesses – the wildlife.

However, the basis of destination uniqueness needs careful consideration. Competition between destinations for tourism revenue is increasing. Wildlife tourism is a unique resource for some destinations that can potentially enhance their competitiveness. Wildlife such as the kangaroo, elephant and panda offer the potential to develop a point of difference between destinations that is hard to copy. As a result, development of a competitive wildlife-tourism destination requires destination planners to understand the particular inherent strengths and weaknesses of that destination for wildlife tourism. This book provides some useful ideas about how this can be applied at a national level.

Chapters 1-4 reviewed the global geographical distribution of the different forms of wildlife tourism, allowing us to identify key factors generally associated with the extent to which wildlife tourism has developed in different destinations at a global level (Box 13.3).

Box 13.3: Factors positively associated with the level of development of wildlife tourism

Tourism supply factors

- Factors positively affecting tourism in general, such as mildness of climate, safety, political stability, availability of tourism infrastructure (e.g. transport, accommodation), availability of other tourism attractions and accessibility/proximity to markets.
- Initiatives for product development of wildlife tourism (or related forms of tourism), with involvement of tourism industry and governments.

Tourism and wildlife tourism demand factors

- Accessibility/ proximity of markets
- Receptivity of the domestic market to wildlife tourism
- Awareness and image of the destination in general, and of wildlife tourism (or related forms of tourism)
- Level of cooperation and involvement of tourism industry and governments.

Wildlife supply factors

- The size and quality of the protected-area system (and to a lesser extent, other natural areas readily accessible to tourism).
- Diversity and abundance of wildlife (especially of endemic species), and availability of scenic, relatively-undisturbed natural areas (especially for wildlife watching). An insufficient supply of wildlife in source countries in relation to demand also contributes to people travelling to other countries for wildlife-tourism for hunting and probably also for wildlife watching.
- Availability of popular or unique animal species that are can be predictably accessed, approached and viewed, generally during the day and without undue hardship.
- Abundance of 'game' species (for hunting and fishing)

Adapted from Higginbottom and Buckley, 2003

A critical conclusion is that countries that score well on tourism factors and those that score well on wildlife factors are often different, since more-developed countries tend to have larger domestic markets (including for wildlife tourism) and better tourism infrastructure, whereas the world's highest biodiversity tends to occur in less-developed countries. Countries that score high on tourism supply and demand factors generally have the largest and most sophisticated zoos, as these do not depend on a supply of wild animals in the host country. For wildlife-tourism involving free-ranging animals, there seem to be two categories of countries that have greatest potential. The first consists of countries that score very high in tourism supply factors and moderately high in wildlife supply, such as USA, Canada, Australia and New Zealand (see Chapters 3,4). USA and Canada, in particular, benefit further by having substantial domestic and international markets for wildlife tourism. The second category is countries that score very high in wildlife supply factors, and moderately high in tourism supply, such as Mexico and India. A few countries may be considered

to score high in both, such as South Africa and Costa Rica. Scotland may be an example of a country that, while not scoring high on quantitative wildlife factors, has a strong local market (including the rest of the UK) and some wildlife resources that, with appropriate industry and government initiatives may have significant potential. This seems to be the rationale motivating recent product development and marketing initiatives for wildlife tourism in Scotland (see Table 13.1; The Tourism and Environment Forum, 2003, A&M Training and Development, 2002). These are all, however, gross generalisations, and the suitability of a country or other destination for wildlife tourism depends on the particular form of wildlife tourism and market segment under discussion. Further, wildlife tourism involves much more than ground operators in the supply country. Travel agents, outbound operators and other members of the travel trade operate in source countries with strong markets, even when the product they are selling is mostly in other countries (see Chapter 10).

The broad lesson, in terms of developing destinations for wildlife tourism, is that if wildlife tourism is to grow substantially in a particular destination, then it is critical to address obstacles that lie outside the scope of wildlife tourism itself. In particular, initiatives that support wildlife conservation and environmental rehabilitation may be needed in countries or regions that score low in wildlife factors due to historical degradation, while initiatives relating to socio-economic development and political stability are needed in countries that score low in tourism factors. While it is likely to be outside the scope of a wildlife tourism strategic planning initiative to address major problems in these areas, it is important to approach wildlife-tourism development with these important contextual issues in mind and, where possible, support initiatives that address these issues.

Economic aspects of wildlife tourism

A number of common issues have been identified concerning the economic aspects of wildlife tourism. Table 13.2 summarises major factors limiting achievement of financial benefits to businesses and economies, along with suggested mechanisms to address them.

Table 13.2: Economic factors limiting achievement of benefits from wildlife tourism

The level/form which applies to each is indicated in bold + brackets, where t=tourism or small business, n=nature-based tourism, w=wildlife watching tourism, h=hunting/fishing tourism, z=zoo. Further details are available in the indicated chapters.

Category	Obstacle	Proposed mechanisms to overcome
Operator	Difficulties achieving commercial viability (zw) (Ch.3,10)	Greater business orientation of staff through availability of training programs and extension. (Ch.3). Maximise income to individual operators by restricting supply. Zoos and hunting continue to raise standards of animal welfare and promote benefits to conservation (Ch. 3)
	Increasing government compliance and insurance costs and inability of smaller operators to absorb them (zw) (Ch.3)	Minimise government compliance costs. Governments consider how to limit litigation risks.
	Problems with small business management and operation, including lack of understanding of tourism distribution systems (t) (Ch.10)	Improved strategic business management, especially use of pricing, competitive business strategies, use of distribution systems (Ch. 10). Enhanced support for business training and support from government and industry associations, including advice to new industry entrants.
	Decline in government funding support (zw) (Cch.3)	Research and education to demonstrate economic contributions of wildlife tourism to government. Lobby government. Increased support role by industry associations (Ch. 10).

	High competition between operators within some regions (zw)	Cooperation at a national level with competition between individual operators (Ch. 10).
	Poor marketing knowledge by some operators (nzw) (Ch.3,10)	Measures to support improved application of marketing practices at the level of individual businesses (Ch. 10) and at higher levels. Cooperative marketing initiatives.
Market	Poor knowledge of demand (especially market size, demand for different types and attributes of products, comparison of different product markets, factors affecting visitor satisfaction and/or perceived service quality) (zw) (Ch. 3,9).	Research on demand issues (Ch. 9).
	Some decline in demand (zh) (Ch.3,4)	Examine products offered and promotion.
	Demand exceeds supply in some regions (h) (Ch.4)	Conservation and restocking of 'game' species. Policy environment supporting sustainable hunting of desired species.
Product	Low product quality standards in some cases (twz) (Ch.3)	Total quality management (Ch.9). Provide variety of styles of activity; make experiences 'mindful'; provide substitute experiences where target species not seen. (Ch. 9). Build accreditation programs and develop/promote guidelines (Ch.10,11). Improved interpretation (Ch. 12). Training, education and information.
	Accreditation lacks effectiveness in marketplace (n) (Ch.11)	Build credibility, awareness and adoption of accreditation programs (Ch.10,11)

Operator issues that act as constraints on economic benefits are mostly generic to tourism or nature-based tourism (largely dealt with in Chapter 10) or are specific to the form of wildlife tourism involved (see Chapters 2-4), and are not covered again here. Below we consider further some general issues for wildlife tourism relating to market and product development issues.

Wildlife tourism is often considered to consist of a number of niche markets such as whale-watching, bird-watching or hunting, as well as a larger more diffuse market for wildlife and nature interaction generally. Wildlife tourism products may be designed for specialist niche markets and involve small numbers of people engaged in viewing particular species, who experience a relatively high level of involvement or interaction with those animals. Alternatively, they may be designed for a larger 'mass market', who have a lower level of involvement, and for whom wildlife is simply one part. The 'mass market' generalist operator may include a variety of wildlife tourism interactions, but emphasise the entertainment and non-wildlife components of the tour or attraction. A 'mass market' generalist operator requires standardisation of their product, while a specialist operator needs to adapt their product to different customer groups or wildlife conditions (see Chapter 10). Generalist operators also tend to involve larger firms than those involved in specialised wildlife tourism. Both types of operator try to target advertising to potential customers, but the first will typically use specialist magazines while the second may distribute brochures through travel agents (see also Chapter 10).

While such a distinction is useful in business development and marketing, support for the development and promotion of wildlife watching may have been impeded by an incorrect perception that it is mostly restricted to niche markets. A review of wildlife tourism in Scotland (A & M Training and Development, 2002) indicated that dedicated wildlife tourism (mainly wildlife watching) enterprises attracted approximately equal numbers of 'wildlife enthusiasts' and people who were 'seeking a wildlife experience as part of their general holiday'. In current Scottish marketing initiatives, it is thus being recognised that wildlife is part of tourism in general, with the capacity to add significantly to the visitor experience. Experiences in North America (e.g. Manfredo, 2002; HDNRU, 2001; Chapter 1) and with many well-known wildlife watching sites (e.g. African wildlife safaris) and activities (e.g. whale watching) around the world, also indicate that wildlife watching has wide market

appeal. Further, it seems that with careful design and adequate safeguards, larger volumes of visitors can be accommodated at many wildlife-viewing sites. Thus, a greater focus on developing wildlife tourism products to suit the generalist market may be desirable in economic terms.

Another central question that affects the economic benefits from wildlife tourism concerns product development, through improvement of existing products or development of new and innovative products. This may be considered a significant opportunity for wildlife tourism. One approach to improving the development of new wildlife tourism products involves improving the skills and capacity of business operators. In a number of countries, there has been increasing contact between organisations such as Tourism Offices (Scotland, Canada and the USA) and wildlife tourism operators. The Canadian Tourism Commission provide a notable example, by facilitating partnerships called 'product clubs' as a starting point for product development (Pam Wight & Associates, 2001). These were supported initially by the Canadian Tourism Commission at a local or regional level. Here the new product developed is shaped and developed by the operators and people who are involved in the product. Another opportunity discussed in Chapter 12 involves improving the quality of interpretation.

A second approach involves development of more novel products. Little research has been conducted on product development in wildlife tourism, although a report on wildlife-tourism new product development is being written by the authors based on Australian research. Opportunities for developing innovative product types have also been suggested by Richie Oberbillig (2000), Higginbottom and Buckley (2003) and Gill (2002). These mostly involve including new species or developing viewing of existing species in novel ways – often enhanced by the use of technology. These new products may be directed at the engagement of the specialist visitor or the general public.

Ensuring that wildlife tourism product development is targeted at specific markets is vital to developing sustainable benefits. Deliberate product development can assist not only in increasing the ability to attract or satisfy customers (or the price they are willing to pay), but can also assist with meeting environmental and other objectives. For example, an increase in the number and quality of wildlife watching or hunting businesses run by private landholders can lead to an increase in land area managed for conservation of wildlife (Chapter 6). However to our knowledge, none of the product development suggestions raised by the above authors have been evaluated with reference to market requirements. One opportunity for a more organised wildlife tourism sector is as a focus for continuing research into new product ideas and different types of customers.

Clearly, managing wildlife tourism strategically requires consideration of potential visitor demand. Higginbottom and Buckley (2003) indicate that significant potential demand exists for quality wildlife watching experiences, and a number of recent authors argue that there is scope for growth of wildlife-watching tourism (see Chapters 1 and 9; A&M Training and Development 2002). Some studies in the USA indicate that there is strong latent demand among the public for wildlife-watching, which could be best met by making such opportunities more readily accessible (e.g. HDNRU, 2001). However, the actual demand for wildlife tourism is dependent on the design of attractive products and experiences. This is a critical area for further research.

Wildlife and the natural environment

Major obstacles to sustainability that result from issues relating to the wildlife/natural environment, with suggested mechanisms to overcome them, are presented in Table 13.3. These deal with the impacts of the wildlife on the product-market system, the impacts of using wildlife as a product on the wildlife, as well as general threats to wildlife that potentially impact on both.

Table 13.3: Wildlife-related factors limiting achievement of benefits from wildlife tourism

The level/form at which each applies is indicated in brackets, where t=tourism or small business, n=nature-based tourism, w=wildlife-watching tourism, h=hunting/fishing tourism, z=zoo. Further details are available in the indicated chapters.

Category/Obstacle	Proposed mechanisms to overcome
Inherent difficulties with wildlife as a tourism product, especially lack of predictability/control, and mobility (whz) (Ch. 2,12)	Creative design of wildlife viewing infrastructure and facilities based on good species knowledge and sometimes use of technology (Ch.2,3 Richie Oberbillig, 2000; Manfredo, 2002; Higginbottom et al. 2003; Higginbottom and Buckley 2003). Use of interpretation to assist in finding animals and interpreting their behaviour, especially through guides (Ch. 2,4,12). Use of knowledgeable guides. Training of guides in wildlife skills. Presenting the lack of predictability as an asset. Alternatively limit access to wildlife resource to increase perceived scarcity value.
Practical constraints on access and viewability of many wildlife species/ environments (w) (Ch.2)	
Existing and potential negative impacts on wildlife and habitats, especially associated with: - decline of wild populations (wh) - introduction of exotic species (h) - animal welfare (w especially hz) - animal rights (w especially hz) (Ch.2,3,4,5)	Improve management and monitoring (Ch.2,3,11) e.g. design products/ viewing areas to minimise impacts. Develop further guidelines/codes of practice. Build accreditation and aspects of accreditation relating to wildlife impacts (Ch. 11). Research to better understand likely impacts (Ch. 5). Use total economic value approach (Ch.8). New product development to minimise negative impacts while maintaining or enhancing visitor satisfaction. If significant negative impacts cannot be avoided, do not proceed with tourism.
Limited adoption of appropriate management and monitoring (w) (Ch.2,11)	Development of user-friendly monitoring techniques. Education of operators and protected area managers. Greater cooperation between operators and management agencies. Link to accreditation/licensing. Increased funding of protected area management agencies. (Ch.11)
Lack of knowledge of effectiveness of certain management measures, especially education (whz) (Ch.9,11)	Research on visitor responses to management strategies, especially education (Ch.9)
Threats to wildlife populations (and consequently wildlife tourism) that are due to factors other than tourism (wh) (ch.2,11)	Improve general wildlife and habitat conservation measures. Wildlife tourism/ tourism operators/associations lobby government and support enhancement of such measures.

Compared with most tourism products, wildlife presents a particular challenge because it is less amenable to presentation and advertising as a consistent experience, particularly in free-ranging settings. Thus wildlife-watching experiences sold to the mass market have tended to involve a relatively restricted range of situations where animals of interest can be predictably found in a certain location. With improving use of technology and interpretation and more creative design, however, the range of viewing experiences available to the mass market appears to be increasing, and literature on how to design wildlife viewing experiences and manage wildlife for wildlife watching is beginning to emerge (e.g. see Richie Oberbillig, 2000, Manfredo, 2002, The Tourism and Environment Forum, 2003).

The major opportunity for all forms of wildlife tourism in relation to impacts on wildlife is for increased synergies with conservation (Chapters 2,3,4,6). Referring to Figure 13.3, this can be conceptualised as ensuring that the flows between wildlife and the various elements of the economic system move positively in both directions (not just from the wildlife to the other elements). However one of the biggest challenges for wildlife tourism is to ensure that business and conservation goals are mutually compatible and if possible mutually reinforcing. Chapter 6 outlined a range of

potential positive consequences of wildlife tourism for conservation. Table 13.4 explores ways that businesses can incorporate conservation goals into their activities in ways that are cost neutral or financially beneficial to them.

Table 13.4: Mechanisms for wildlife tourism operators to integrate conservation and financial objectives

Potential consequences to a business from incorporating conservation (or animal welfare) goals	Mechanisms to achieve financial goals
Positive	***Mechanisms to realise these positive consequences***
Increased customers due to enhanced customer perceptions of quality.	Target markets that are prepared to pay more for conservation. Promote conservation initiatives (including innovative conservation-friendly product designs) in advertising. Contribute to general initiatives to educate consumers. Obtain and promote accreditation, awards etc.
Able to continue operating into future in face of increased government requirements regarding conservation-friendly practices.	Support government initiatives to regulate to ensure conservation-friendly practices.
Government (and industry association) support and benefits associated with conservation practices e.g. preferential licensing systems, government-aided promotion.	Promote awareness of conservation values of product with government, industry associations and potential consumers e.g. through media, liaison with staff.
Wildlife populations on which tourism is based are sustainable and therefore still available for tourism.	Promote consumer and government awareness of the ecological sustainability of the business and participate in monitoring to demonstrate this.
Personal satisfaction of operator and staff, boosting morale and performance.	Encourage and reward staff for conservation-related actions.
Negative	***Mechanisms for addressing this issue to ensure financial goals are still met***
Additional financial costs associated with designing and managing the business to minimise negative impacts and/or due to providing funds for conservation initiative.	Increase prices and/or (if not detrimental to wildlife) customer numbers.
Decreased clients due to raising prices to cover costs of conservation management.	Target markets that are prepared to pay more for tourism products that support conservation. Promote conservation initiatives in advertising. Contribute to general initiatives to educate consumers about sustainable tourism. Obtain and promote accreditation, awards etc.
Decreased visitor satisfaction associated with restrictions on visitors designed to minimise impacts.	Provide quality interpretation to promote visitor understanding and support for restrictive measures. Use innovative means such as technology to enhance visitor experience in non-destructive ways.

In situations where there is no commercial business involved, but the manager still needs to consider both visitor desires and conservation objectives (as is typically the case for protected area managers), some of Table 13.4 is still relevant. In particular, awareness of the importance of addressing visitor satisfaction and wildlife protection simultaneously, and the key role of interpretation and innovative product design in addressing this, underlies contemporary approaches to developing recreational wildlife watching experiences. This applies especially in the USA (e.g. Duda et al., 1998; Richie Oberbillig, 2000) and may provide important lessons for commercial wildlife tourism.

Host communities

Major obstacles that relate to the host community, with associated mechanisms to overcome them are presented in Table 13.5. The steps that need to be taken to overcome these obstacles are mostly generic to tourism and covered in Chapter 7. Those that relate to community attitudes to wildlife tourism deserve special attention here, particularly given that the limited available research indicates a high level of public interest in wildlife and how it is managed (e.g. Duda et al., 1998).

Table 13.5: Host community-related factors limiting achievement of benefits from wildlife tourism

The level/form at which each applies is indicated in brackets, where t=tourism or small business, n=nature-based tourism, w=wildlife watching tourism, h=hunting/fishing tourism, z=zoo. Further details are available in the indicated chapters.

Category/ Obstacle	Proposed mechanisms to overcome
Lack of sufficient inclusion of hosts and their interests, especially in less developed countries and indigenous peoples (t) (ch.7)	Mechanisms to ensure effective host participation and ensure local benefits (Ch.4,7).
Social costs to hosts (t), including interference with existing uses of wildlife (wh) (Ch.4,7)	Strategic planning approach that includes hosts (Ch. 7). Incorporate social responsibility into accreditation and guidelines. Build accreditation effectiveness. Government support to facilitate communication with hosts and education of operators.
Host attitudes involving opposition to certain kinds of wildlife tourism or attributes of certain products (social acceptability) (hz) (Ch.3)	Ensure effective host participation and local benefits (Ch.7). Ensure animal welfare and conservation-related impacts are adequately addressed, and enhance conservation benefits. Education and marketing to raise awareness of high standards in animal welfare and conservation initiatives (Ch.3)
Hosts perceiving wildlife to be of little intrinsic value in countries with substantial wildlife resources. (Ch.7)	Educate public about issues relating to value of wildlife at the destination. Appropriate domestic marketing of wildlife tourism.

The philosophies of animal rights activists (stating that the use of animals for human benefit is wrong) can be inherently inconsistent with most (if not all) forms of wildlife tourism (see Chapter 3 and 4), but people holding such attitudes form a small minority in most countries (e.g. USA: Duda et al., 1998). Public concerns about animal welfare and sustainability of wildlife populations, by contrast, are widespread at least in more-developed countries. Thus, dealing with animal welfare issues adequately, and being seen to do so, is critical in a political sense to the future of hunting and zoos. In the same way, ensuring sustainability of populations that are subject to wildlife-watching is critical to the future of that form of wildlife tourism. This in principle creates an important incentive for wildlife tourism operators and others concerned about economic sustainability of such businesses to design and manage wildlife tourism to minimise any negative impacts in these areas. Similarly, awareness of, and sensitivity to, the values of the public is important for government agencies involved in development and management of wildlife tourism (see Chapter 7). This awareness has been a major motivator for growth of the field of 'human dimensions of wildlife management' (see Decker et al., 2001), mainly in North America, and its particular application to understanding public attitudes to hunting and wildlife-related recreation (e.g. Duda et al., 1998).

Increased economic and social benefits for host communities from wildlife tourism can flow from programs to support development of appropriate wildlife tourism activities in regional and economically depressed areas, and a number of recent initiatives provide ideas (see Chapters 6,7,8). Another potential benefit to host communities is the recreational opportunities provided to locals through the creation of new tourism facilities. Finally, there is scope for increased involvement of hosts in wildlife tourism, especially of indigenous people, to provide them not only with employment and economic benefits, but also to enhance the nature of the tourism product (Chapter 7).

Overarching Issues

Table 13.6 summarises a number of overarching issues that cut across various parts of the whole wildlife tourism system depicted in Figure 13.3. We suggest that most of these can be most effectively addressed through the coordinated, strategic approach

advocated in the first part of this chapter. This will also help facilitate increased funding and support for research focused on critical strategic issues.

Table 13.6: Major overarching obstacles encountered to sustainability and benefits of wildlife tourism

Further details are available in the indicated chapters.

Category/Obstacle	Proposed mechanisms to overcome
Little coordination and strategic direction.	Development of organisation or network and/or strategy.
Lack of adequate funding for strategic initiatives.	Demonstrate economic and conservation importance of wildlife tourism. Lobby government. Explore other funding opportunities.
Lack of skills or awareness covering the scope of wildlife tourism issues.	Education of planners and managers about the full scope of wildlife tourism issues.
Insufficient consideration of all aspects of sustainability in planning and management.	Businesses use Triple Bottom Line Accounting (Ch.10). Governments measure Total Economic Value (Ch.8). Education of operators about sustainability.
Little communication between diverse group stakeholders.	Development of organisation or network and/or strategy.
Little government support.	Development of organisation or network to lobby for increased government support.
Conflicts between stakeholders, especially between tourism, conservation and/or host community stakeholders.	Development of organisation or network and/or strategy.
Fragmented nature of wildlife tourism.	Development of organisation or network and/or strategy.
Lack of knowledge in critical areas, especially demand, product development opportunities and economic value.	Research in critical areas.

Lack of funding and lack of political support for strategic planning and development of wildlife tourism are common and particularly challenging obstacles. Wildlife agencies in North America report that the greatest 'challenges' facing their wildlife viewing programs are inadequate resources and lack of agency support and legitimacy (Pierce and Manfredo, 1997; B. Hernbrode, July 2003, pers. comm.; R. Garrison, October 2003, pers.comm.). The average state program budget reported by Pierce and Manfredo (1997) was US$309,000 (this contrasts with the average budget allocated to state agencies for support and management of hunting of over $13 million) and the average (sole) coordinator spent only 33% of their time administering the program. The programs rely heavily on volunteers. Similarly the fledgling Wildlife Tourism Australia is currently greatly limited in its potential by reliance on contributions from members. Plans to develop a wildlife tourism strategy in Scotland have been put on hold given lack of significant resourcing (C. Warburton, June 2003, pers. comm.). However, government-related financial assistance has supported review work (A&M Training and Development, 2002) and other early initiatives by the Scottish Wildlife and Nature Tourism Operators' Association (The Tourism and Environment Forum, 2003). In practice, without strong government support and involvement, such initiatives are likely to be of limited effectiveness. The key challenge therefore is to raise awareness of the importance of wildlife tourism, and especially wildlife-watching, among key stakeholders.

Some proposed mechanisms for boosting benefits from wildlife tourism potentially have positive effects in a number of areas. For example new product development can be used to enhance visitor satisfaction, boost operator profits and improve management of negative impacts on wildlife. Improvements in animal welfare are not only of benefit to wildlife, but may also boost (or maintain) visitor satisfaction, customer numbers and political support for zoos. Restricting supply of commercial wildlife-watching opportunities may have both environmental benefits and increased

benefits to the commercial operators and visitors to whom these experiences are restricted.

Future directions for wildlife tourism planning and development

In this final chapter we have examined wildlife tourism from a strategic destination planning perspective and discussed some key issues in planning for the future of wildlife tourism. This was guided by our starting point that the goal is to achieve (as a minimum) Triple Bottom Line sustainability, and further, to maximise benefits for wildlife, host communities and tourism-related businesses. A vision which brings together all these benefits is of wildlife tourism that links an entrepreneurial approach, high quality products and a strong market orientation with wildlife conservation and host community participation (cf Vaughan, 2000). At the tourism destination level, a key challenge for destinations with distinctive and significant wildlife resources is to link more effectively the wildlife with the destination in order to enhance destination competitiveness. This needs to be coupled with adequate management and monitoring to ensure that wildlife tourism is ecologically sustainable.

We conclude that although there has been a number of promising initiatives that provides some ideas and inspiration, a strategic approach linking wildlife and tourism organisations within a destination or national policy context is yet to be fully achieved. We have thus sought to provide some directions for achieving this vision. There appear to be clear reasons why wildlife tourism can provide net positive benefits to wildlife and all human participants, but there are many challenges in achieving this net positive benefit. Many of these challenges seem to derive from planning and organising deficiencies, and some suggestions in this area have been made. Ultimately, strategic planning of wildlife tourism requires the support of a diversity of stakeholders, further research and adequate resourcing.

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DISEASE AND WINTER FEEDING OF ELK AND BISON:

A REVIEW AND RECOMMENDATIONS PERTINENT TO THE JACKSON BISON AND ELK MANAGEMENT PLAN AND ENVIRONMENTAL IMPACT STATEMENT

Prepared for
The Greater Yellowstone Coalition

By
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44 Duncan District Road
Sheridan, Montana

27 October 2005

INTRODUCTION

I was contracted by the Greater Yellowstone Coalition (GYC) to prepare a report on relationships between winter feeding of elk and bison on the National Elk Refuge (NER) and certain existing and potential diseases of those populations. The focus was on how the winter feeding of elk and bison affects transmission, prevalence, and impacts of brucellosis and potentially chronic wasting disease (CWD) in NER and Grand Teton National Park (GTNP) elk and bison. Secondly, the GYC was interested in how Alternatives 4 and 6 in the Draft Bison and Elk Management Plan and Environmental Impact Statement, or BEMP (USDI 2005), prepared by staff of the NER and GTNP, may affect brucellosis and potentially chronic wasting disease (CWD) in NER and GTNP elk and bison.

I spent the last 22 years of my 28-year career with the U.S. Department of Interior as the senior wildlife biologist at the National Elk Refuge in Jackson, Wyoming. Among my responsibilities, I coordinated the refuge's wildlife and habitat management programs. This included coordinating the winter feeding program for 5,000-11,000 elk and a bison herd that grew from 55 animals to nearly 800 bison during my tenure, monitoring disease and mortality of elk, and conducting various research projects concerning elk population dynamics and ecology. I served on the Greater Yellowstone Interagency Brucellosis Committee (GYIBC), the Jackson Hole Cooperative Elk Studies Group, the Jackson Interagency Bison Committee, and provided data for and technical review of sections of the BEMP.

This report addresses topics of interest outlined by the GYC, and may serve to supplement comments by the GYC on the BEMP. The management alternatives and environmental analyses of the BEMP, and consequent decision documents, pertain strictly to lands of the NER and GTNP and to the Jackson elk and bison herds which seasonally occupy those jurisdictions. To be most useful to the NEPA review process, my comments focus on those jurisdictions and herds when possible. However, there are commonalities between the winter feeding programs and related disease concerns at the NER and 22 feedgrounds where the State of Wyoming feeds about 16,000 elk in winter. In fact 3 of those feedgrounds in the Gros Ventre drainage occur within the distribution of the Jackson elk and bison herds. Because elk interchange between those feedgrounds and the NER and share common spring-summer-fall ranges with elk and other cervids from adjacent herds, some of my comments about disease issues necessarily pertain to the Jackson herd as a whole, and more generally to other elk feedgrounds south of Jackson Hole in western Wyoming.

OVERVIEW OF JACKSON ELK AND BISON HERDS

The Jackson elk and bison herds are dynamic, migratory populations that have contact with adjacent populations of conspecifics (other herds of the same species) and other wildlife species within, and to a lesser degree, beyond the 5,200 km^2 of the Snake River drainage delineated as the Jackson herd unit (Smith and Robbins 1994, Cain et al. 2001). Herd unit fidelity is quite high among Jackson elk (Boyce 1989, Smith and Anderson 2001). Interchange is less than 10% with adjacent herds, as prescribed by the Wyoming Game and Fish Department to delineate a distinct population of elk (Thorne et

al. 1997). However, more recent investigations showed that 32% of elk captured and radiocollared on elk feedgrounds in the Gros Ventre drainage in 2002 and 2003 spent summer in either the Green River Herd Unit (15%) or east of the Continental Divide in the Wiggins Fork Herd Unit (17%, Figure 1). One of 25 radioed female elk remained in

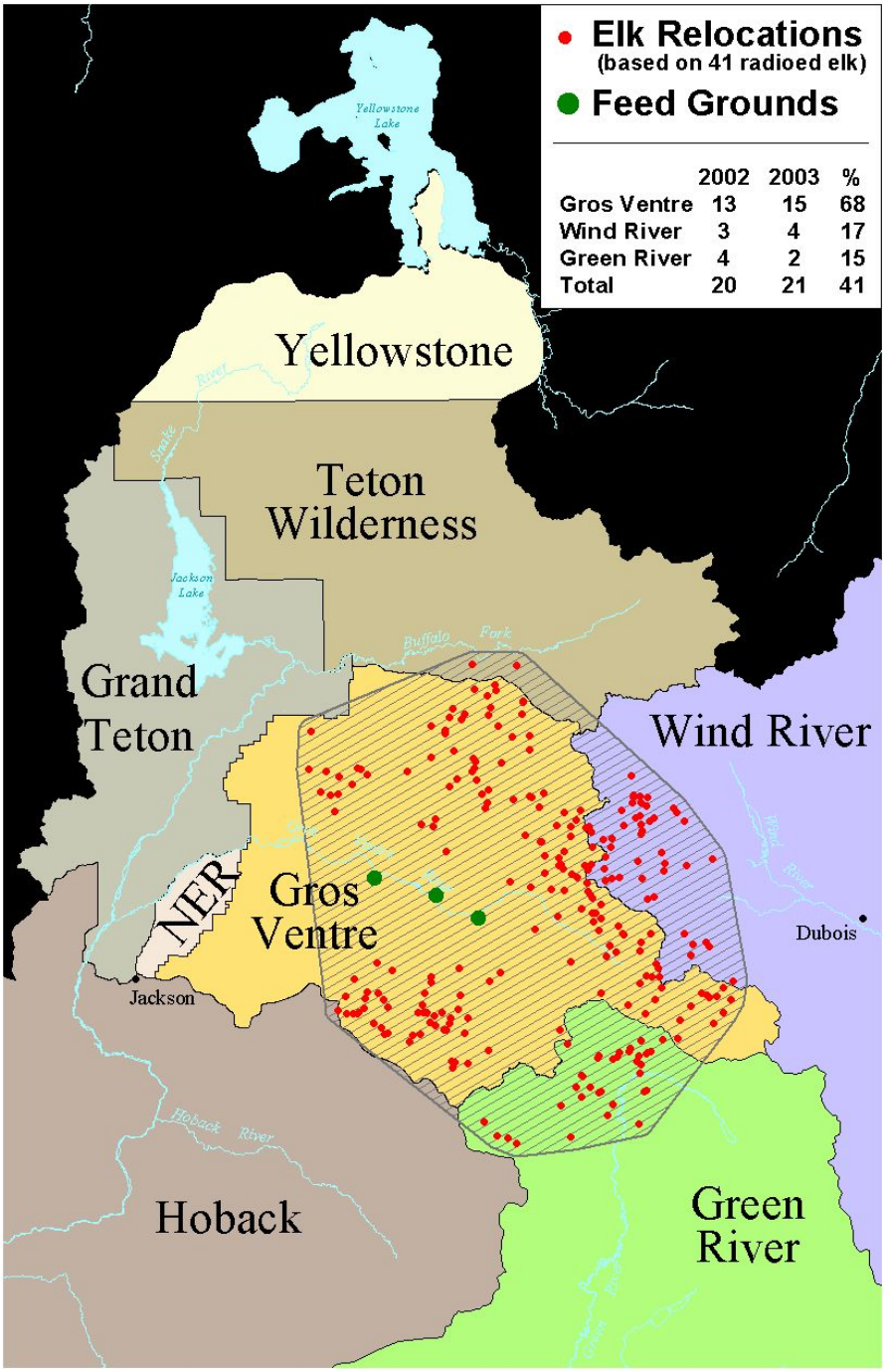

Figure 1. Distribution of summer-fall relocations of radiocollared elk captured on the Alkali and Patrol Cabin elk feedgrounds of the Gros Ventre drainage.

the Wind River drainage yearlong since 2003 (Bruce Smith, unpublished data). Elk from the Jackson herd and elk from east of the Continental Divide (Wiggins Fork and Cody Herds), interchange on shared summer ranges in the eastern Teton Wilderness (Rudd et al. 1983, Queen and Ryder 1996, Smith and Anderson 2001). Conversely, marked elk from Montana's Gravelly-Snowcrest Range have traveled south into Wyoming, including GTNP and the NER (Hamlin and Ross 2002). One such neckbanded animal spent 3 winters on the NER and a radiocollared elk from Montana spent one winter on NER (Bruce Smith, unpublished data). Jackson herd elk also share summer range in Yellowstone National Park with elk from Yellowstone's Northern Range (Craighead et al. 1972) and elk from Idaho's Sand Creek herd (Brown 1985). Thus, an infectious agent endemic in one herd could be transmitted to one or more adjacent herds, or to other susceptible species in or adjacent to the Jackson herds.

Jackson bison also show high fidelity to their seasonal ranges in GTNP and the NER (Cain et al. 2001). However, males have traveled south into the Green River drainage (USDI 2005). In addition, bison from Yellowstone National Park, on at least 2 occasions, joined the Jackson bison herd (Cain et al. 2001).

Evidence of infectious and transmissible diseases in elk and bison of the Greater Yellowstone Area (GYA) have been recognized for many years (Mohler and Eichenhorn 1913, Rush 1932, and Honess and Winter 1956). Much of the discussion of diseases of elk and bison in this report draws on the abundant literature available on the topic. Furthermore, I turned to three recent sources of information that were specifically developed during the BEMP process to address disease issues. These were: 1) an expert panel of administrators, wildlife scientists, and veterinarians convened November 12-14, 2002 to evaluate anticipated disease effects of each of the BEMP's 6 management alternatives; 2) an independent disease impact analysis contracted by the US Fish and Wildlife Service and National Park Service (URS 2003); and 3) an ecological perspective on infectious agents of concern for the Jackson elk and bison populations (Peterson 2003).

As a general model, infectious disease transmission and prevalence are a function of 1) the number and density of infectious animals, 2) the number of susceptible hosts, and 3) conditions which facilitate contact and exposure of susceptible hosts to infectious individuals. The size of the Jackson elk herd ranged from about 9,000 to 18,000 animals during 1982-2002 and provides a mean annual hunter harvest in excess of 3,000 elk (Lubow and Smith 2004). As in most ungulate herds in northern latitudes, densities of animals increase during winter as snow accumulations limit their mobility and forage availability (Demarais and Krausman 2000, Barmore 2003). Densities of elk on the NER are 300-2,500/km^2, depending on winter severity. Functional density of elk on feedlines reaches 200/ha, exceeding densities on many elk farms (USDI 2005). The introduced Jackson bison herd remained smaller than 25 animals from 1968 to 1975, the year the animals began wintering on the NER. After discovering the elk winter feedgrounds on the NER in 1980, the population underwent a rapid increase to more than 800 animals in 2004. The bison likewise are highly crowded during winter feeding operations (USDI 2005).

Peterson (2003) noted that a "vast array" of parasites could infect Jackson Hole elk and bison and possibly cause disease. Based on suggestions from wildlife biologists

and managers of the Jackson elk and bison populations, he focused his detailed review of infectious agents on those that might be most important to 1) the elk and bison populations, 2) other wildlife populations, and 3) livestock and/or public health in the Jackson Hole area. The URS (2003) report considers a very similar list of diseases. These include documented microparasitic (including brucellosis) and macroparasitic diseases, and undocumented microparasitic diseases (such as bovine tuberculosis and chronic wasting disease).

BRUCELLOSIS

The etiology, pathogenesis, transmission, and biological and economic implications of brucellosis are well understood. For detailed reviews see Thorne (1982), GYIBC (1997), Thorne (2001), and Peterson (2003). In short, elk, bison, and cattle, and a number of other species of mammals are susceptible to infection with the bacterium, *Brucella abortus*, which causes the disease brucellosis.

The hallmark signs of the disease are abortion during the last half of gestation and nonviable calves. Generally, only the first pregnancy after infection results in abortion, and then only in about half of first pregnancies. Oldemeyer et al. (1993) estimated that when 38% of female elk wintering on the NER tested seropositive for brucellosis, calf production would have been diminished by 7% due to brucellosis induced abortions. Elk and bison may also experience synovitis and arthritis which cause lameness in some infected animals. Other clinical signs in bison include retained placentas, orchitis and epididymitis (see Thorne 2001 for details). Horizontal transmission (disease transmission to other herdmates, as opposed to vertical transmission which is from mother to offspring only) may occur when *B. abortus* is ingested from contaminated reproductive products associated with abortions, births, or vaginal discharges.

About 30,000 (3%) of the 1 million free-ranging North American elk are fed by state or federal agencies in winter (Smith 2001). The longest standing winter feeding programs occur in Wyoming where about 75% of these 30,000 elk are fed, and elk are infected with brucellosis at all of the 23 feeding locations that have been tested (19 of 23; GYIBC 1997). Wyoming feedground elk commingle with elk on 2 eastern Idaho feedgrounds that tested positive for brucellosis in 1998 and 1999 (Smith 2001). Elk that share seasonal ranges with feedground elk experience much lower seroprevalences. Where elk are not fed in winter and do not share ranges with infected elk, bison, or cattle, seroprevalence is essentially zero (Thorne 2001, Peterson 2003).

The Jackson elk were first tested and found infected with brucellosis in 1930 (Murie 1951). Elk in Jackson Hole and elsewhere were originally infected with *B. abortus* by infected cattle brought from Europe or by bison that were initially infected by cattle ((Thorne 1982). Peterson et al. (1991) suggest that the source of brucellosis in Jackson bison was either undetected infections in the small herd that was permitted to free-range beginning in 1968 or interspecific transmission of *B. abortus* from elk, most likely in 1980 when bison began sharing feedlines with elk on the NER. Whatever the source, the Jackson elk and bison herds have been chronically infected with brucellosis for decades. The high densities of elk that congregate on the NER and the 3 Gros Ventre feedgrounds perpetuate the disease by exposing large numbers of animals on feedgrounds to *B. abotus* contaminated tissues during the peak period of abortion – February through

May (Thorne 2001, Smith 2001, Peterson 2003). Although all evidence indicates that elk require artificial concentration (e.g. feeding), or periodic re-exposure to infected tissues from elk, bison, or cattle (e.g. Yellowstone National Park elk) to perpetuate the disease (Cheville et al.1998, Thorne 2001, Peterson 2003), bison are far more efficient at intraspecifically transmitting the disease and can maintain it without fencing or winter feeding (e.g. Yellowstone National Park bison). However, the winter feeding program at the NER probably contributes to the exceptionally high (77 - 84%) seroprevalence among the Jackson bison (GYIBC 1997, USDI 2005). Nonetheless, the Jackson bison herd continues to grow rapidly (USDI 2005).

For a disease that biologically is relatively benign in elk and bison, brucellosis has engendered astonishing costs, controversies, lawsuits, and ill feelings (Smith 2001). The crux of the matter is that brucellosis, which has experimentally been transmitted from elk to cattle and bison to cattle, can cause disease in domestic livestock and/or humans, leads to economic costs to ranchers, and loss of a state's brucellosis class free status which can result in marketing hardships. A national brucellosis program was implemented in 1934 to eradicate brucellosis from cattle and domestic bison herds (Ragan 2002). As that program has neared its stated goal, the focus has shifted to the GYA and its wildlife reservoir of infected elk and bison as a potential source of reinfection of cattle herds (Cheville et al. 1998). Although there is considerable disagreement regarding the risk of *B. abortus* transmission from bison and elk to livestock, regulatory officials surmised that wild elk or bison were the probable source of infection of cattle at six locations in Wyoming prior to 1997 (GYIBC 1997). A brucellosis outbreak in an eastern Idaho cattle herd in 2002 was attributed to infected elk (Ragan 2002). Brucellosis was identified in another eastern Idaho cattle herd in October 2005 and is under investigation (Idaho Department of Agriculture website).

Wyoming lost its brucellosis class free status in February 2004 after a cattle herd in Sublette County (2003) and another in Bighorn County (2004) tested positive for brucellosis (USDI 2005). Two additional cattle herds in Teton County, Wyoming tested positive and were depopulated in 2004 (USDI 2005). The Sublette and Teton County herds occurred within the western Wyoming elk feedground complex, and in the absence of a cattle source for the infections, elk were implicated as the source of the disease. Consequent to legal actions over brucellosis in feedground elk and bison during the 1990s, Smith (2001) noted "Brucellosis has elevated the [wildlife] feeding issue to a new level of public awareness. More citizens question the justification for feeding when the practice is responsible for the spread and maintenance of the disease in elk." Thus, disease management, and management of brucellosis in bison and elk in particular, is one of the four management goals of the BEMP.

REDUCING BRUCELLOSIS AMONG ELK AND BISON

This discussion begins by acknowledging previous admonitions about the vast difference between elimination of *B. abortus* from feedground elk and bison and reducing prevalence in herds to some low level (Keiter and Froelicher 1993, Cheville et al. 1998). Secondly, I treat elk and bison separately, given the differences in social behavior and consequent differences in transmission and maintenance of infections in the two species.

Elk

Keiter and Froelicher (1993) reviewed the lawsuit brought against the federal government by the Parker Land and Cattle Company after Parker's cattle herd became infected with brucellosis, allegedly as a result of contact with brucellosis infected wild bison and/or elk. They suggested the only fully effective means of eradicating brucellosis from the GYA's elk and bison would be depopulation, "an extreme policy choice, with serious political, ecological, and economic repercussions." Peterson (2003) and others agree with their perspective on eradication.

In 1994 the GYIBC formulated and adopted a position statement that recognizes the link between concentration of ungulates at feedgrounds and disease problems. The statement concludes, "…the GYIBC strongly recommends that winter feeding of elk should be discouraged, and no additional public or private feedgrounds be established in the Greater Yellowstone Area. Establishment of emergency or permanent feedgrounds for other wild ungulates, which may act as an attractive nuisance and concentrate elk or bison, is likewise discouraged (GYIBC website)."

Keiter and Froelicher (1993) further stated that, "in Wyoming at least, any effective response to wildlife brucellosis will almost certainly require reduction – if not elimination – of the elk feedgrounds, which will undoubtedly impact elk population numbers and hunting opportunities." These endorsements and the accumulated serologic data tell us that elk do not maintain brucellosis in the absence of feedgrounds (excepting where they commingle with chronically infected bison). Thus, elk management reliant on winter feeding to maintain excessively large populations of elk clearly perpetuates chronically infected elk herds.

Given the polarization and politicization of the brucellosis issue, Keiter and Froelicher (1993) advocated a regional brucellosis control policy based on the principle of risk reduction, not disease eradication. This is to say that brucellosis in elk and bison should be "managed" in a way that minimizes the risk of transmission of disease from wildlife to livestock. Cheville et al. (1993), Thorne and Kreeger (2002), Peterson (2003), and others have provided useful lists of management actions that may reduce prevalence of brucellosis in wildlife and the risk of transmission to livestock.

Removal of livestock from the GYA or grazing only by neutered yearlings would remove the risk of brucellosis infections of concern to federal and state agricultural interests. Both seem unlikely. If we assume no changes in livestock grazing patterns, disease risk management would include 2 components. 1) Limiting or preventing contact of free-ranging elk and bison with cattle during periods when brucellosis abortions (primarily) and parturition (secondarily) occur in elk and bison – a period covering February through mid-July each year [although Jackson bison (Berger and Cain 1999) and elk (Smith 1994*a*) occasionally give birth and presumably abort outside those months]. 2) Reducing the prevalence of brucellosis in elk and bison herds. Remedies to the chronic infection rates of southern GYA elk either lie in elimination of elk feedgrounds, or reducing prevalence of the disease in elk that use the feedgrounds and are associated seasonally with those animals. Because long-range movements of elk into and out of the western Wyoming and eastern Idaho feedground complex occur, a sizeable area must be considered – one far beyond the scope of the BEMP.

A major hurdle to reducing infection rates of chronically infected elk and bison herds is that no reliable data exist regarding how the probability of intra- or interspecific brucellosis transmission decreases as a function of decreasing *B. abortus* prevalence in bison or elk herds. Peterson (2003) advises that the risk may not decline linearly, or at all, where elk remain concentrated on feedgrounds. A single aborted fetus hosts large numbers of infectious doses of *B. abortus* that could infect large numbers of elk at a feedground (Thorne 2001). The same is true in free-ranging bison because of their gregarious nature (Davis et al. 1995).

Setting this unresolved and problematic issue aside, two *Brucella* vaccines, developed for vaccination of cattle against brucellosis, have been evaluated in elk. Clinical trials using RB51 *Brucella* vaccine in elk were unsuccessful in conferring protection against abortion (Kreeger et al. 2002). After several years of clinical trials of Strain 19 *Brucella* vaccine in elk, the Wyoming Game and Fish Department developed an integrated program in the late 1980s to eliminate brucellosis in feedground elk and to keep elk and cattle separated to prevent *B. abortus* transmission. The Brucellosis-Feedground-Habitat (BFH) Program used ballistic vaccination of feedground elk with Strain 19 vaccine to reduce brucellosis infection rate. Habitat enhancements on winter ranges adjacent to feedgrounds, designed to limit the duration of feeding and elk concentrations, complemented the vaccination program. Vaccinations began in 1985 at the Alpine feedground, and nearly all calf elk at 21 of 22 feedgrounds have been vaccinated on an annual basis beginning in the mid-1980s to mid-1990s. The 22nd feedground, Dell Creek, serves as a control where elk are not vaccinated. Although some initial declines in seroprevalence occurred, the 23.6% collective seroprevalence among vaccinated elk reported during 1993-2004 did not statistically differ from the 32.4% seroprevalence of unvaccinated elk at Dell Creek (Dean et al. 2004). More troubling is that earlier declines in seroprevalence of the Alpine feedground elk reversed in 2000 with seroprevalence ranging from 50-59% during 2001-2004 (Dean et al. 2004). The reason for the return to prevaccination seroprevalence rates are uncertain (Peterson 2003).

Research on efficacy of Strain 19 indicates it confers 25% protection against abortion and no protection against infection under controlled conditions (Roffe et al. 2004). The level of protection that Strain 19 confers to free-ranging elk, given all other factors that can affect disease transmission, variability of exposure dosages, individual susceptibility to disease, and herd immunity, remains uncertain (Gross et al. 1998, Roffe et al. 2004). Gross et al. (1998) modeled brucellosis seroprevalence over a 100-year time-frame under a variety of conditions. Intensive vaccination with a vaccine having a 25% efficacy did not eliminate brucellosis. That modeling predicted a reduction in brucellosis seroprevalence by 40-50% with supplemental actions, such as test and slaughter of seropositive animals, required to eradicate the disease. Roffe et al. (2004) did not recommend the use of Strain 19 for wildlife management because it is "…highly unlikely to lead to significant reduction or eradication of brucellosis in feedground elk". Furthermore, ballistic vaccination of large numbers of elk requires access to the animals that only confinement or feeding permits. This crowding of animals is at the heart of the transmission–infection–disease perpetuation cycle that has persisted in feedground elk.

Boyce (1989) reported brucellosis seroprevalence rates among adult female elk on the NER during 1970-1985 averaged 39%. In the absence of all but a small scale experimental vaccination program by the State of Wyoming during 1989-1991,

brucellosis seroprevalence at the NER averaged 14.7% in recent years (Dean et al. 2004). These data suggest that the much larger numbers of elk fed on the NER, an order of magnitude greater than on state feedgrounds, did not increase seroprevalence. Furthermore, seroprevalence rates were unrelated to elk numbers on the NER since recurrent testing for brucellosis began in 1970 (Smith and Roffe 1997). Smith and Roffe (1997) suggested that the type of feed (or method of feeding) provided elk may have affected seroprevalence of brucellosis, which was lower consequent to the NER's conversion from feeding baled hay to mechanized feeding of pelleted hay. This may occur because feeding with mechanized equipment facilitates spreading elk out across feedgrounds and moving elk to clean areas for feeding. Moreover, pelleted alfalfa is more rapidly ingested and more rapidly digested than long hay. Elk spend less time concentrated on feedlines, and more time distributed across the refuge foraging on standing grasses. In addition, elk are fed fewer days each winter at the NER than at state of Wyoming feedgrounds (Smith 2001, Western EcoSystems Technology 2004). Thus, feed type, feeding method, and the duration of feeding reduce concentrations of animals on feedgrounds where brucellosis is most likely transmitted among elk.

The above discussions suggest three things: 1) crowding of elk on feedgrounds maintains brucellosis in southern GYA elk, 2) time spent on feedgrounds and feedlines increases exposure to and transmission of *B. abortus*, 3) vaccination of elk with Strain 19 is unlikely to reduce seroprevalence rates of feedground elk sufficiently to satisfy the concerns of government administrators and the livestock industry about the risk of brucellosis transmission from elk to livestock.

Although several invasive population management techniques, listed by Thorne and Kreeger (2002), are potentially useful for reducing brucellosis prevalence in southern GYA elk herds, they are unlikely to be accepted by the general public for a variety of reasons, both ethical and practical in nature. Thus, we are left with elimination of elk feedgrounds as the most practical means of greatly reducing brucellosis. Although there is no assurance that this approach will eradicate brucellosis from the southern GYA elk herds, it is certain to be more successful in advancing that goal than the management practices used over the past several decades. Its success is based upon keeping the size of elk herds within carrying capacity of available winter range, which reduces animal to animal contact and exposure to pathogens. As opportunities for disease transmission decline and attrition removes brucellosis infected elk from herds, an increasingly diminished infection rate emerges.

Regarding the Jackson elk herd, winter mortality would increase in the absence of winter feeding (Hobbs et al. 2003). Also, a smaller number of elk wintering on the NER would produce a smaller annual surplus to be removed, alleviating the necessity of long hunting seasons on the NER and southern GTNP. Consequently, elk may not vacate transitional and early-season winter ranges in GTNP and the northern NER to congregate on the southern half of the NER (which is closed to hunting) beginning in October. Furthermore, elk would graze in smaller group sizes across the NER, southern GTNP, and adjacent National Forest lands during winter, when they are no longer reinforced by the prospect of being fed to congregate in large numbers on the south half of the NER 2-3 months before winter feeding commences. Termination of feeding would yield important benefits for refuge habitat conditions and other game and nongame wildlife species (Smith et al. 2004).

Carrying capacity of winter ranges in Jackson Hole varies markedly with environmental conditions, particularly growing season weather conditions and winter severity (Hobbs et al. 2003). Natural and human-caused changes to habitats modify habitat effectiveness (Toweill and Thomas 2002). If feeding were phased out at the NER, elk that winter on the NER would number fewer than in recent years, and numbers throughout the Jackson herd unit may fall below the 11,029 objective number currently authorized by Wyoming Game and Fish Department (USDI 2005*a*:79, 253).

To increase the chances of successfully weaning elk that migrate to the NER from winter feeding, managers must be willing to accept a winter herd size nearer the number the refuge can sustain in a severe winter than the number sustainable in an average or mild winter. Through adaptive management, if the modeled population sizes for various winters (Hobbs et al. 2003) prove too low, population sizes can be revised upward. The pace at which feeding of elk on the NER could be phased out is dependent on the pace at which herd reductions to habitat carrying capacity can be effected. Secondly, should a decision to phase out feeding ensue from the BEMP-EIS process, feeding should not be terminated until the elk herd size is reduced to winter range carrying capacity. Premature termination of feeding, while elk and bison numbers exceed winter habitat capacity, could result in unacceptable winter losses and many animals moving onto private lands in search of forage.

Finally, the Wyoming Game and Fish Department (Clause et al. 2002) and a private consultant (Western EcoSystems Technology 2004) identified the 3 feedgrounds in the Gros Ventre drainage among those with the highest potential for moving elk off feedgrounds and onto native winter ranges. Wildlife telemetry studies (Smith and Robbins 1994, Smith 1994*b*) and observations of neckbanded elk demonstrate some interchange of elk between the NER and Gros Ventre feedgrounds. Thus, if an effort to phase out feeding on the NER were coordinated with a like action in the Gros Ventre, the potential for elk that have been fed on the NER to find and habituate to the Gros Ventre feedgrounds could be avoided. A coordinated State-federal effort would serve to wean the Jackson elk herd from winter feeding.

Bison

As previously noted, bison herds can maintain chronic infections of brucellosis in the absence of winter feeding or other forms of artificial crowding, suggesting that like cattle, bison are a more natural host for *B. abortus*. Their gregariousness, including during parturition, provides ample opportunity for exposure to infected fetuses and live births (Cheville et al. 1993). Thus, the elimination of feeding on the NER is highly unlikely to eliminate brucellosis in bison, although there may be some decline in the level of infection (URS 2003). The likelihood of Jackson bison to remain chronically infected presents two problems: 1) bison would be a continuing source for transmission of *B. abortus* to cattle, and 2) bison would be a continuing source for reinfection of elk. Thus, unlike elk from which brucellosis could be expected to decline to very low prevalence over time once weaned from feedgrounds, bison would require more rigorous management.

The Jackson herd remains sufficiently small and confined in distribution that an effective vaccination program could be undertaken. Both Strain 19 and RB51 *Brucella*

vaccines have been administered to bison in clinical trials to protect bison against *B. abortus* induced abortions and to protect against infections. Strain 19 vaccinations of both pregnant adult bison and bison calves induced abortions in 57% of adult vaccinated bison and 73-83% of calfhood vaccinated bison. Strain 19 conferred no protection against abortion or infection (Davis et al. 1991, 1993). Peterson's (2003) review of the RB51 vaccine trials concludes that it offers little protection against abortion or infection in bison.

Strain 19 and RB51 vaccines were developed in the mid-20th Century to protect cattle against brucellosis. The clinical trial results referenced in this report show that elk and bison immunologically do not respond to these vaccines as cattle do. The chances are not good that a new vaccine for bison or elk will be developed in the near term. Without sufficient profit motive, American drug manufacturers are reluctant to conduct the research, development, testing, and marketing of vaccines against virulent human pathogens (e.g. Asian bird flu), which have far larger sales markets. Unless a persistently low prevalence of brucellosis in elk is tolerable, bison will require additional management applications, beyond termination of winter feeding. Otherwise, elk may become reinfected by contact with bison -- one explanation for the chronic brucellosis infection of elk (albeit at low prevalence) on the Northern Range of Yellowstone National Park (Cheville et al. 1997). In short, an integrated approach to brucellosis reduction/elimination on the NER and GTNP will require effectively addressing brucellosis in both elk and bison to be successful.

CHRONIC WASTING DISEASE

The Disease

Chronic Wasting Disease (CWD) is one of a group of fatal, transmissible spongiform encephalopathies (TSEs) that affect the central nervous system of a range of mammals, including humans. Scrapie, which affects domestic sheep, bovine spongiform encephalopathy (BSE or mad cow disease) which affects cattle, and Creutzfeld-Jacob disease (CJD and vCJD), which affects humans, were probably among the best known of the TSEs, until CWD became widespread in North American farmed and free-ranging cervids over the past decade. The best evidence suggests that all TSEs are caused by prions, non-DNA containing proteins. A remarkable characteristic of these non-living proteins is that they are highly resistant to environmental degradation, and can be indirectly transmitted to other animals through excreta, contaminated soil, and decomposing carcasses, as well as by direct animal to animal contact (Williams et al. 2002, Miller et al. 2004). CWD is apparently not a food-borne disease as was the case with BSE (Williams et al. 2001). There is no known immune response to the CWD agent and no immunization or cure for this fatal disease. Williams et al. (2001) and Williams et al. (2002) provide reviews of CWD and related TSEs.

Distribution

CWD was first recognized in captive mule deer and elk in research facilities in Colorado and Wyoming (Williams and Young 1980). The disease was subsequently

found in free-ranging mule deer, elk, and white-tailed deer in northcentral Colorado and southeastern Wyoming during 1985-1990. The origin of the CWD causing prion and whether the disease originally arose in cervids in research facilities or in the wild is unknown. The rapid spread of CWD among cervid game farms was likely facilitated by transport of diseased deer and elk among game farms. CWD infected elk have since been found in game farms in Colorado, Kansas, Minnesota, Montana, Nebraska, Oklahoma, South Dakota, Wisconsin, Alberta, Saskatchewan, and South Korea. Infected captive deer and elk herds are depopulated or quarantined once identified (Williams et al. 2002). Carcasses are generally disposed of by incineration or burial.

Since 2000, CWD has spread from infected elk farms to wild cervids in Saskatchewan, Nebraska, and South Dakota. The origins of CWD in free-roaming elk in northwestern Colorado, white-tailed deer in Wisconsin and Illinois, and mule deer in New Mexico and Utah remain unclear. Most recently, CWD was discovered in free-ranging mule deer in Alberta, white-tailed deer in New York and West Virginia, and a moose in Colorado –the first wild moose and the fourth cervid species diagnosed with CWD. CWD has not been demonstrated in bison or other bovids.

Closer to Jackson Hole, CWD has spread to wild cervids across the northern third of Colorado and as far south as Colorado Springs. In 2002, CWD infected mule deer were diagnosed near Vernal, Utah, some 200 miles south of the NER. CWD has progressed northward and westward in Wyoming from the endemic area of southeastern Wyoming, and new areas of infection annually have been detected by surveillance (Wyoming Game and Fish Department website). Mule deer infected with chronic wasting disease were found near Baggs, Wyoming, just west of the Continental Divide, and in fall 2003 near Worland, Wyoming, just 90 miles east of the Jackson elk herd unit. Then in October 2005, two harvested mule deer tested positive for CWD immediately northwest of Thermopolis, Wyoming (Wyoming Game and Fish Department website). CWD has not been identified in deer or elk in Idaho.

Surveillance and Prevalence

CWD is transmissible among mule deer, white-tailed deer, and elk, and free-ranging populations of these species potentially link the most recent cases of CWD infection in Wyoming, or others that have remained undetected, with deer and elk west of the Continental Divide. The state of Wyoming initiated surveillance for CWD in 1997 by sampling and examining tissues from hunter killed deer and elk. In the endemic area of southeastern Wyoming, the overall prevalence found in harvested deer and elk have averaged 7.7% and 3.4%, respectively (Dean et al. 2004). Prevalence appears to run higher in white-tailed deer than mule deer, and latency of the disease appears to be shorter in white-tailed deer, as 5-6 month-old clinically ill fawns have been reported in Wisconsin and Nebraska. The youngest free-ranging mule deer and elk detected with CWD were $\geq$17 months of age (Samuel et al. 2003).

The Wyoming Game and Fish Department initiated sampling of elk from the Jackson elk herd for bovine tuberculosis (TB) in 1992. Again, samples were collected from harvested elk, primarily form GTNP and the NER. Beginning in 1996, tissues were also collected from most of these harvested animals to conduct surveillance for CWD. Through 2002, 2,532 elk were tested for TB and 1,095 for CWD (Dean et al. 2004). No

positive test results have been obtained for either disease to date (Wyoming Game and Fish Department web site). In addition, NER staff has recorded all elk mortalities that occur on the refuge for many years. Information about animal health and factors that contribute to mortality are recorded and necropsies performed on suspect mortalities that may harbor non-endemic diseases (Smith and Roffe 1994). No CWD mortalities have been documented.

Potential Threat to Jackson Elk

Potential sources of infection of Jackson elk include game farmed cervids or free-ranging cervids infected with CWD, or infectious materials from dead animals transported to Jackson Hole that are discarded on the landscape. Disease has not been reported in the nearest game farms in eastern Idaho. With stricter regulation of interstate transport of cervids from and to game farms, the opportunity for clinically or subclinically infected animals to enter the three elk farms in eastern Idaho, or other game farms near the GYA, is much reduced from just a few years ago. A growing number of states have adopted regulations prohibiting the transport of carcasses, or portions thereof most likely to harbor disease causing prions, out of known CWD infected areas. The movement of live animals is also strictly regulated by most states to avoid the import or export of CWD infected animals.

If we consider possible sources and routes by which Jackson elk may become naturally infected with CWD, we are dependent on understanding the true regional distribution of CWD among cervids, movement and seasonal distribution patterns of individual populations, and potential for transmission of CWD among herds based upon duration and seasonality of shared ranges.

Detection of CWD Distribution

It is highly unlikely that the total distribution of CWD in wild cervid populations is known. First, there is a lengthy incubation period in mule deer and elk (Williams et al. 2002), and secondly practical limits to the intensity and extent of sampling of CWD in Wyoming and elsewhere results in a probability of detection of CWD infected animals that is low where population sizes are high, sampling intensities (harvest rates) are low, or disease prevalence is very low. For example, Wyoming collected tissues from 3,958 deer and elk harvested statewide in 2004 for diagnostic testing. The goal was to provide a 99% probability of detecting CWD if it existed at a $\geq$1% prevalence in each of the state's seven administrative regions. Statewide population estimates were >92,000 elk, >500,000 mule deer, and an undetermined number of white-tailed deer in Wyoming in 2003. Some 35,000 of the state's mule deer, or about 7%, were harvested in 2003 (Wyoming Game and Fish Department 2004). I crudely estimated 147,000 white-tailed deer throughout Wyoming by applying this same 7% harvest rate to the 10,328 white-tails harvested in 2003. Thus, the estimated statewide population of deer and elk totals some 740,000 animals, necessitating a massive sample collection effort to meet the above standards (99% probability of detecting CWD if it existed at a $\geq$1% prevalence) and requirements of random sampling established for surveillance of CWD in free-ranging cervids (Samuel et al. 2003).

Prevalence was generally ≥1 % of elk and deer herds in Colorado and Wyoming before sampling of harvested animals detected newly infected areas or populations (Miller et al. 2000). A 99% probability of detection of at least one infected animal in a herd of 10,000 deer or elk having a ≥1% infection rate (≥100 infected animals) would require collecting tissues from 449 animals, a number greater than was achieved (104-317 sampled annually) during each year of the 5 years of CWD sampling during 1996-2002 of the Jackson elk herd. The level of sample collection in one of those 5 years (317 in 1998) would have provided a 99% probability of detecting a 2% or greater infection rate. However, 2% of a population of 10,000 represents ≥200 infected animals – a level of infection that likely could sustain itself where animals are seasonally highly concentrated. Thus, when the first handful of CWD infections occurs in a large deer or elk herd, the probability of detection through random hunter field checks or check station collections is unfortunately quite low.

Without complete depopulation and testing, failure to detect CWD does not translate into absence of the disease (Samuel et al. 2003). Areas with CWD positive deer and/or elk have likely gone undetected in Wyoming and elsewhere. This is one reason that Wyoming, Colorado, Wisconsin, and other jurisdictions continue to detect newly infected herds/locations each year. The other reason for geographical expansion of CWD is that deer and elk are highly mobile and dispersing individuals, that may infect animals in adjacent herds, are periodically sampled.

Certainly, Wyoming and other states have finite resources that they can expend on CWD surveillance, and Wyoming did not conduct statewide surveillance for CWD until fall 2003. But this means that CWD infected cervids in areas such as the Gros Ventre drainage or areas in and adjacent to the Green River basin's feedground complex would presumably only have been detected prior to 2003 if tissues from a clinically ill animal were collected. Such focused surveillance of sick animals by trained agency personnel, often alerted by contacts from the public, is termed targeted surveillance. Targeted surveillance increases the probability of detection of diseased animals, but this is not a systematically conducted procedure in most states (Samuel et al. 2003). Rather it is an opportunistic identification of animals presenting the clinical signs of CWD – which in and of themselves are not diagnostic of CWD. Laboratory testing by established procedures is still required to diagnose disease. More importantly, Miller et al. (2000) noted that targeted surveillance was a poor predictor of CWD prevalence in an area or population, only a means of detection. There are no antemortem tests for CWD other than tonsilar biopsy, which is only useful in deer and is impractical and expensive in a wildland setting (Wolfe et al. 2002).

Movements of Cervid Populations

Western Wyoming is home to the largest and most diverse ungulate populations in the Rocky Mountain region ((Sawyer and Lindzey 2001), including tens of thousands of elk, mule deer, pronghorn antelope, and thousands of white-tailed deer, moose, and bighorn sheep, as well as mountain goats. As described in the overview, the Jackson elk and bison herds interchange or seasonally share ranges with elk herds to the north, south, east and west. Moreover, mule deer, white-tailed deer, and moose herds, some of which are highly migratory, occur within and adjacent to the Jackson elk herd unit.

Recent studies of the 30,000 – 40,000 strong Sublette deer herd, which winters in the Green River basin near Pinedale, demonstrate that these deer migrate 60-100 miles to the east, west and north and summer in five mountain ranges (Sawyer and Lindzey 2001). This includes the Gros Ventre Range, which also provides summer range to elk that winter on the NER, 3 Gros Ventre feedgrounds, and adjacent winter ranges on national forest lands. In addition, some mule deer and white-tailed deer from the Dubois Herd Unit, east of the Continental Divide, and Jackson cervids overlap/interchange in the upper Gros Ventre drainage. Some 60% of radiocollared adult female elk leave the Wiggins Fork Herd Unit, near Dubois, during summer and fall (Queen and Ryder 1996). Some of those also spend summer-fall along the Continental Divide of the Gros Ventre Range and the Teton Wilderness.

Although the Jackson elk herd may be the most studied elk herd in North America (Boyce 1989), only recent investigations (2002-2003) using radio-telemetry revealed that 32% of female elk wintering in the Gros Ventre drainage may spend all or part of the summer-fall seasons in the Green River drainage or east of the Continental Divide in the Wind River drainage – watersheds occupied by the Green River and Wiggins Fork elk herds, and the Sublette and Dubois deer herds (Figure 1). CWD is not known to occur in Idaho. Therefore natural expansion of the disease is likely to occur from Wyoming source cervid herds. The most likely routes by which CWD may enter the Jackson elk herd are from the east from the Dubois area, or from the Green River basin to the south. Diseased animals would likely first appear in the Gros Ventre drainage, the eastern and southern hydrographic divides of which serve as migratory pathways. The most recently detected expansion to Worland and then Thermopolis, Wyoming, puts CWD at the foot of the Owl Creek and Absaroka Mountains, ranges that rise to the west toward the Continental Divide and support large populations of deer and elk contiguous with the Jackson elk.

Infected deer or elk moving into the Jackson elk herd, or alternatively, elk and/or deer from Jackson commingling with infected deer or elk to the east or south, then returning to Jackson Hole, could initially bring the disease to Jackson Hole. This of course would require some unknown level of prevalence to occur in the Dubois or Green River areas, likely as a result of natural expansion of known disease foci near Worland/Thermopolis and southcentral Wyoming, or as yet undetected locations farther west. If and when this will occur cannot be predicted. However, prevalence of CWD has been stable or increased and geographic distribution continued to expand among free-ranging deer and elk populations (Miller et al. 2000, Miller and Conner 2005, Wisconsin Department of Natural Resources website). Mountainous topography, rivers, and other geographic barriers have not prevented the spread of CWD in Colorado, where the disease has been most intensively studied in free-ranging deer and elk. Well-documented movements of deer and elk into and out of Jackson Hole and the sharing of portions of seasonal ranges with adjacent herds provide little comfort that the Jackson cervid populations are somehow isolated from the outside world.

Why Concern Over CWD in Jackson Hole

Concerns over the introduction of CWD into the NER and western Wyoming's feedground elk in general are many-fold.

1. The conditions of animal crowding, shared feedsites, bedsites, water sources, and accumulated excreta on feedgrounds promote relatively unsanitary conditions that benefit many pathogens and promote transmission of diseases which have a density dependent component. This explains why brucellosis is maintained in feedground elk, but not those unassociated with feedgrounds or other infected species. Prevalence of CWD in research facilities has exceeded 90% (Williams and Young 1980). Peters et al. (2000) reported prevalence of CWD in game farmed elk of 59%, although few prevalence rates among game farmed elk have been reported. Furthermore, infected captive herds are generally destroyed soon after discovery of CWD so that prevalences of protracted epidemics are not achieved.

2. CWD will amplify on feedgrounds because of increased animal-animal contact.

3. Environmental loading of feedsites with infectious amounts of the CWD agent will occur.

4. Animals return to feedgrounds year after year (Smith and Robbins 1994, Smith 1994*b*) with recurrent opportunities for direct or indirect infection.

5. Probability of infection increases with age, at least in deer (Miller and Conner 2005), and feedground elk are long-lived (Boyce 1989, Smith and Anderson 1998, Clause et al. 2002).

6. Modeling 1.2-1.3 infectious contacts per infectious individual produced the most plausible disease and population dynamics in mule deer. When horizontal transmission rates exceeded 1.3, rates of transmission rapidly exceeded those observed to date from field data (Miller et al 2000). Much higher transmission rates must occur in captive cervids to explain observed epidemics of confined populations (Miller et al 2000).

7. Models forecast that when CWD epidemics reach 5% prevalence, steep declines in populations could occur over 30-50 year time scales without management intervention (Gross and Miller 2001).

Miller and Conner's (2005) recently published paper on CWD in mule deer of Colorado makes the following additional points that should be of interest to natural resource managers of western Wyoming.

1. Based on documented prevalence, spatial distribution, and computer modeling, their findings reinforced previous work (Miller et al. 2000) that CWD among cervids in the endemic areas of northeastern Colorado and southeastern Wyoming represents an epizootic with a protracted time scale. That is, the disease outbreak is still in the early stages and will continue for some unknown time.

2. Disease prevalence increased in both sexes over a 7 year time span. Prevalence of CWD was higher on winter ranges within a game management unit than throughout the game management unit. They state the "data suggest that

areas where deer congregate seasonally may be particularly important in sustaining CWD epidemics in free-ranging populations."

This latter point is both good news and bad news for those who may advocate proactively addressing CWD before it affects the Jackson elk herd and the Wyoming feedground complex in general. The bad news is that even in free-ranging populations of mule deer in Colorado, where CWD is established, CWD epidemics may be sustained by seasonal concentration of animals. The good news is that if concentrations of animals can be reduced by population reductions and by enhancement of habitats and animal distributions, managers may be able to limit disease transmission and prevalence.

Williams et al. (2001) noted that control of CWD is problematic in captive cervids and more so in free-ranging cervids. The potential number of susceptible hosts, their wide distributions and movements, the ecological and economic values of these resources, and legal and ethical constraints on treating public resources the same as captive private herds are among the difficulties of testing and controlling the disease in wildlife. Feedgrounds probably represent conditions intermediate between free-ranging populations and herds that are confined yearlong. Elk remain on the NER about 6 months/year (Smith and Robbins 1994, Smith et al. 2004). Animals are fed an average 2 ½ months/year and longer on state feedgrounds (Smith 2001, Western Ecosystems Technology 2004), at which time functional densities may exceed those observed in game farms (Peterson 2003, USDI 2005). Feces accumulate to depths on feedgrounds that require harrowing each spring to break up this mat of organic material that suppresses growth of new grasses. *B. abortus* and other pathogens may remain viable for 100 days in such pastures (Thorne and Kreeger 2002). Some CWD epidemics have been attributed to contaminated pastures, suggesting prions persist in contaminated environments for >2 years (Williams et al. 2002, Miller et al. 2004).

Without better information about CWD transmission mechanisms, seasonality of transmission, and the relative risk of indirect transmission (via environmental contamination) versus direct transmission, one cannot quantitatively predict CWD prevalence that feedground elk may achieve compared to game farmed elk. However, if prevalence is even half that of game farmed elk (Peters et al. 2000), an escalating rate of CWD-induced mortality will drive populations toward extinction, based upon modeling of the disease in mule deer (Miller et al. 2000, Gross and Miller 2001). As Smith (2001) noted, should a disease as virulent and transmissible as CWD or bovine tuberculosis become established within the GYA, the number of infected herds of susceptible species could rapidly expand. Twenty-five elk herds alone, totaling 120,000 elk, winter in the GYA (Toman et al. 1997). Because distributions of adjacent herds overlap, disease could ultimately spread across the 18 million acre area. In Jackson Hole or the GYA in general, public alarm and outrage over the expected ecological and socioeconomic impacts will compel elected officials, resource managers, and disease regulators to take drastic actions long before elk populations are in jeopardy. However, once well-established, our current understanding and available tools are insufficient to eliminate CWD, short of depopulation.

In general, it is much easier to prevent the introduction of a disease into a given area than to control or eradicate a disease that has become established (Wobeser 1994). Surveillance is important for detecting new foci of CWD, assessing spatial distribution

and prevalence, and monitoring changes over time (Samuel et al. 2003). However, surveillance must be complemented with actions that reduce the risk of CWD spreading to new locations, and limit amplification of CWD in newly infected herds to effect management programs that protect populations. Amplification addresses the potential for increased transmission rates, prevalence, mortality, and resultant ecological and socioeconomic impacts consequent to a previously disease-free population or area experiencing its first case(s) of a new disease. Risk factors associated with both exposure of wildlife to CWD and amplification of CWD following exposure appear in Table 1.

Table 1. Known and suspected CWD risk factors (from Samuel et al. 2003).

Exposure Risk Factors	1) Areas adjacent to CWD-positive wildlife 2) Areas adjacent to land on which TSE-positive animals, farmed or wild, have lived 3) Areas with CWD-positive farmed or captive herds 4) Areas with concentrations of farmed or captive elk or deer 5) Areas that have received translocated deer or elk from CWD-infected regions 6) Areas permitting transport of hunter-killed elk or deer carcasses from CWD infected areas
Amplification Risk Factors	1) Areas with high elk or deer population density 2) Areas with a history of CWD animals or CWD contaminated environments 3) Areas with low abundance of large predators 4) Areas where free-ranging elk or deer are artificially concentrated by baiting, feeding, water development, and other human related habitat modifications

The exposure risks of NER elk, or more generally cervids of western Wyoming, contracting CWD include risk item 6. The lack of game farms in Wyoming is a positive. The nearest known locations of CWD infected wild animals are 90 miles west of the Jackson elk herd unit. Wyoming adopted a regulation in 2005 prohibiting the transport and disposal of carcasses, or parts thereof, from the CWD endemic area to other areas within and outside Wyoming (see Wyoming Game and Fish Department website).

Amplification risk factors for NER elk, and western Wyoming elk in general, include 1 and 4. These are significant risk factors as the scientific literature is replete with information that high cervid densities and artificial concentrations encourage transmission and amplification of disease, including CWD (see Dunkley and Cattet 2003). Large predators remove sick and otherwise compromised individuals from prey populations, limiting exposure of conspecifics and other susceptible species to disease.

The Wyoming Game and Fish Department has primary responsibility for management and health of the state's resident wildlife. Although Wyoming's 2005 draft Chronic Wasting Disease Plan discusses elk feedgrounds, the plan does not prescribe proactive management that will limit amplification of CWD in western Wyoming.

Section 11, Disease Management, of the draft plan acknowledges that CWD may reach northwestern Wyoming, and that much higher prevalence rates and mortality may occur in feedgrounds than in non-fed elk, based upon research from captive elk. Yet the plan prescribes no actions to reduce elk populations and the feeding practices that crowd animals onto feedgrounds. This is particularly troubling when the same section acknowledges that "CWD may reach NW Wyoming" and "the spread of CWD, at best, can be slowed, but not prevented." A number of states have implemented programs to reduce densities and ban private feeding of cervids. These include Colorado, Montana, Nebraska, and Wisconsin which do not have state sponsored cervid feeding programs. In 2003, Teton County and the Town of Jackson, Wyoming adopted citizen-sponsored bans on private feeding of wild ungulates.

The only actions the draft plan prescribes for reducing feedground elk densities or feeding practices are retroactive – after CWD is discovered on feedgrounds. Furthermore, those 3 prescriptions have been in existence since Wyoming's BFH program was adopted in the late 1980s, and have failed to reduce elk numbers on feedgrounds or the duration of feeding (Western EcoSystems Technology 2004).

As the BEMP points out (USDI 2005:136), "the US Fish and Wildlife Service and National Park Service can do little to prevent Jackson Hole mule deer and elk from contracting chronic wasting disease from other ungulates outside the Jackson elk herd unit and transporting it into Jackson Hole." However, Williams et al.(2002) conclude, "CWD could have a dramatic influence on management of free-ranging cervid herds where it is present. Responsible wildlife management and animal health agencies must act to limit distribution and occurrence of CWD in free-ranging and farmed cervids …"

In anticipation of CWD arriving at some point in the future, and with no assurance of better technological means of eliminating CWD than we have for brucellosis or a variety of other cervid diseases (Peterson 2003), the NER and GTNP can proactively adopt prudent measures that will limit the amplification of CWD. 1) Reducing population density is a recognized method for disease control and is based on the idea that infectious disease is density dependent (Wobeser 1994). Population reduction may be used in areas in which CWD is not yet present, with the aim of reducing the potential for the disease to become established or to amplify (Chronic Wasting Disease Taskforce 2002). 2) Phasing out the winter feeding program will limit disease transmission and prevalence in the NER and GTNP (see Van Deelen 2003, Peterson et al. 2002, Dunkley and Cattet 2003). This second measure is dependent upon the first because elk are fed at the NER due to insufficient winter habitat and forage to support current numbers (core problem identified in USDI 2005).

Although CWD is not a disease of bison, it is unreasonable to discontinue winter feeding of elk but not bison. Just as bison discovered the NER elk feedgrounds (Peterson 1991), elk will habituate to areas where feeding is intended only for bison. Thus, the Jackson bison herd will also need to be maintained within winter range carrying capacity. Both actions, population size adjustments and phasing out of winter feeding, should be accompanied by multi-agency programs carried out to enhance the carrying capacity of winter and transitional ranges, as has been laid out in the Jackson Interagency Habitat Initiative. Aune et al. (2002) provided examples of habitat-based programs that conserve elk without winter feeding. A multi-jurisdictional, multi-species approach would best accomplish disease management goals (Chronic Wasting Disease Taskforce 2002,

Peterson et al. 2002). In concert, the above measures will limit direct and indirect routes of transmission, should CWD arrive in Jackson Hole.

Environmental contamination with the infectious agent is a particularly insidious characteristic of CWD where cervids are crowded. It would serve as a perennial source of CWD exposure as elk return to feedgrounds each winter. Infectious agent accumulation would likely vary on a gradient from highest on feedgrounds to lowest on high elevation summer ranges. How much contamination is required on native ranges to provide infectious doses is unknown, but is likely a function of animal density. Without feeding, environmental contamination sufficient to cause disease may still occur in some areas (Miller and Conner 2005), but likely be far less than on feedgrounds where functional densities are far greater. The agent is extremely resistant to chemical disinfectants as well as to physical methods of inactivation. It is still not known whether environments contaminated with TSE agents can ever be completely disinfected (Williams et al 2002).

OTHER DISEASES

Peterson (2003), URS (2003), and the 2002 panel of disease experts identified a number of macroparasitic and microparasitic diseases of concern that currently do or potentially could infect the Jackson herds. URS (2003), based upon opinions of the 2002 panel, evaluated and ranked the relative impact and environmental consequences of these diseases becoming established in the elk and bison herds. Rather than reiterate, I refer the reader to those sources for thorough analyses of diseases. Instead, I will highlight information on three of the endemic diseases among refuge elk and briefly summarize discussions about two virulent, undocumented diseases.

Endemic Diseases

The same crowded conditions responsible for high prevalences of brucellosis in elk and bison on feedgrounds can also foster the transmission and maintenance of other density-dependent diseases. Murie (1951) suggested a link between the prevalence of both scabies and necrotic stomatitis and the overstocked winter ranges in Jackson Hole. Before 1950, Murie (1951) considered necrotic stomatitis to be the most significant cause of winter mortality of Jackson elk. Provisioning of higher quality hay alleviated much of the problem which is caused by entry of the ubiquitous microparasite *Fusobacterium necrophorum* into lesions of the soft tissues of the mouth. Stiff-awned hay and coarse browse associated with overstocked and heavily browsed ranges are primary causes of the lesions. Although cases of necrotic stomatitis still occur on and adjacent to the NER and state feedgrounds, in recent years mortality from this disease has been limited to very few animals. Necrotic stomatitis has not been observed in Jackson bison. Peterson (2003) notes that if winter feeding is curtailed at the NER, managers should maintain elk numbers within winter range carrying capacity to avoid a potential increase in prevalence of necrotic stomatitis.

Psoroptic mange, or scabies, is a condition caused by mites of the genus *Psoroptes*. Severe infestations of these ectoparasites cause a severe exudative dermatitis and alopecia that results in loss of insulation, increased grooming activity, weight loss,

and possibly immune suppression, that predispose severely infested individuals to mortality during periods of severe cold (Smith 1985, Samuel et al. 1991). About 65% (20-30 individuals) of adult male elk that die on the NER annually were afflicted with scabies (Smith 1998). Another 5% of mature bull elk that survive winter show clinical signs of scabies. Scabies reduces survival of trophy size bull elk and the quality of capes of harvested animals. It is unclear whether elk serve as a reservoir for infection of sympatric (geographically overlapping) bighorn sheep (Lange 1982, Peterson 2003). What role feedgrounds may play in transmitting the disease is unknown, although high animal densities would seem to promote transmission. While other factors are probably important in clinical expression, the high density of breeding males in GTNP may play a significant role in the development of scabies (Smith 1985, Smith and Roffe 1994). Reports of psoroptic mange in elk outside the GYA are rare. Psoroptic mange does not occur in bison (Peterson 2003).

Another endemic disease of NER elk, also reported on some Wyoming feedgrounds, is septicemic pasteurellosis. Murie's (1951) single paragraph about this disease (which he referred to as hemorrhagic septicemia) does little more than substantiate that the disease has occurred at the NER for decades. Bison in the GYA have suffered epidemics of this disease, which affects a variety of animals (Miller 2001). Epidemics of pasteurellosis were a significant cause of declining bighorn sheep abundance throughout western North America (Miller 2001). Recently, pasteurellosis was documented during winters 1985-86 and 1986-87 on the NER (Franson and Smith 1988). During the protracted winter of 1992-93, an estimated 160 elk died of septicemic pasteurellosis on the refuge (Wilson et al. 1995). This bacterial (*Pasteurella multocida*) disease is transmitted by direct contact between animals and via aerosols (the exhalants of respiration). It can be particularly virulent among immunologically naïve (not previously exposed to the pathogen) or compromised animals, with rapid progression of clinical signs leading to death (Franson and Smith 1988). It is unknown if the strain of *P. multocida* harbored by Jackson Hole elk threatens sympatric bighorn sheep populations (Peterson 2003). Pasteurellosis in wild ungulates is somewhat dependent on host density (Miller 2001). Peterson (2003) suggests that reducing Jackson elk to winter range carrying capacity and ending winter feeding probably would reduce the incidence of septicemic pasteurellosis in the herd.

Undocumented Diseases

None of the documented diseases of the Jackson elk and bison herds represent the level of population risk that CWD and certain other diseases pose. Undocumented diseases that ranked of high concern among the disease expert panelists, URS (2003), and likewise by Peterson (2003) were bovine tuberculosis (TB) and bovine paratuberculosis (Johne's disease).

Bovine Tuberculosis

Bovine TB is a chronic bacterial disease with a worldwide distribution. Most mammals, including wild and domestic ruminants and humans, are susceptible to the disease (Clifton-Hadley et al. 2001). Bovine TB is caused by the bacterium

Mycobacterium bovis and spreads intraspecifically and interspecifically via aerosols or consumption of contaminated feed. The disease is typically chronic and fatal. Bovine TB has an extended incubation period and the disease may be present in herds long before it is detected as was the case with captive cervid herds in the early 1990s (Clifton-Hadley et al. 2001). Herds of at least 6 species of captive ruminants, including elk and bison, in dozens of game farms across 4 Canadian provinces were diseased and subsequently destroyed. The disease may have been present without detection for 10 years (Roffe and Smith 1992). Elk herds in 8 states (including Montana, Colorado, and the Dakotas) were also part of the infected game farm network. Bovine TB is of major concern to the livestock industry, rebounded in the cattle industry during the game farm epidemics, but the disease is nearly eradicated now from cattle herds (Demarais et al. 2002). Depopulation eliminated bovine TB from captive cervid herds in the U.S. until 2001 when an elk in an eastern Oregon game farm was diagnosed with the disease (Oregon Department of Fish and Game website).

Currently, wild bison in northern Canada and white-tailed deer across much of Michigan's Lower Peninsula are chronically infected with bovine TB. The gregarious nature of both cattle and bison leads to high functional densities of susceptible hosts. White-tailed deer in Michigan have been able to maintain TB due to high densities of deer and the practices of deer baiting during hunting seasons and winter feeding by private citizens (Schmitt et al. 1997). Prevalence among bison tends to be much higher than in deer or elk (URS 2003, Peterson 2003). Surveillance and testing of 2,532 elk in Jackson Hole during 1992-2002 produced no positive cases of TB (Dean et al. 2004).

It was the opinion of the disease expert panel that if Jackson elk and bison herds contract bovine TB in the future, high winter densities compounded by winter feeding would increase transmission and prevalence and TB would be maintained in the herds (URS 2003). Functional densities of elk and bison on the NER far exceed those of deer in Michigan. Should one species contract the disease, it would be spread to the other on the NER feedgrounds (Peterson 2003). As Peterson (2003) noted, "if one desired ideal circumstances for maintaining *M. bovis* in a free-roaming elk population, they would have to go no further than the National Elk Refuge and other GYA feedgrounds." He outlined sweeping measures that would be necessary to eradicate the disease should it become established in Jackson elk and bison, including drastic reductions in elk numbers and test and removal of bison. These measures would be necessary, in combination with elimination of winter feeding, to not only eradicate the disease in Jackson Hole, but to limit its spread elsewhere in the GYA (Peterson 2003).

Bovine Paratuberculosis

Bovine paratuberculosis, or Johne's disease, is caused by *Mycobacterium paratuberculosis* and is a disease of ruminants world wide. *M. paratuberculosis* is related to *M. bovis* and like bovine TB, it produces chronic disease with a long incubation period. The majority of animals in an infected herd may never develop the clinical signs of rough hair coat and gradual loss of body condition, but continue to shed *M. paratuberculosis* in feces (Williams 2001). Susceptible animals ingest the bacteria while feeding or drinking and host density and environmental contamination play a significant role in the shedding-transmission-infection cycle. This is a disease of a significant and

growing concern among livestock interests. Johne's disease can cause mortality in cattle herds ranging from 1-25% (Williams 2001). Population effects, should the disease develop in either Jackson elk or bison, are not certain. Increased density of bison and elk on the NER and winter feeding would enhance disease transmission (Demarais et al. 2002), and therefore prevalence, and mortality (URS 2003).

The disease has been documented in captive and free-ranging elk herds in North America and in ranched bison in the northern GYA, but not in the Yellowstone National Park bison (Peterson 2003). Like bovine TB, the potential sources of contact with Johne's disease for Jackson Hole elk and bison would be infected cattle or farmed cervids or bison. Preventing the introduction of either *M. paratuberculosis* or *M. bovis* through any of these ruminant sources should be a high priority for managers in Jackson Hole (Williams 2001, Peterson 2003).

EFFECT OF ALTERNATIVES ON BRUCELLOSIS AND CWD

The focus of my comments, as requested by the GYC, is to explore and discuss the relationship between disease and feeding of elk and bison. Only two alternatives in the BEMP, Alternative 2 and 6, prescribe a phase out of winter feeding. All others maintain the status quo or some diminished frequency/duration of feeding of elk and bison on the NER with concomitant adjustments in elk and bison population sizes. Alternative 4 is the preferred alternative of the BEMP. Alternative 6 is the alternative endorsed by the GYC.

I was asked to compare how disease impacts would differ between alternatives 4 and 6, the principal elements of which appear in Table 2. Although comparisons of the BEMP's alternatives were previously made by the disease expert panel and by URS (2003), those evaluations are not specifically useful as the BEMP's alternatives were reconfigured subsequent to those efforts. Alternative 6, for instance, was dropped and replaced by an alternative viewed to better meet the purposes, missions, and related legal responsibilities of the National Park Service and US Fish and Wildlife Service (DeLong 2004). Therefore, I will draw on analyses presented in the BEMP and my own interpretations of the relative merit and associated impacts of alternatives 4 and 6.

Winter feeding is not required or mentioned in any of the NER's establishing legislation or executive orders (USDI 2005). Feeding was instituted to compensate for usurpation of winter range by humans and their livestock, to mitigate subsequent conflicts, and because migration corridors out of the valley were fenced and ranched and those migratory elk eliminated (Allred 1950, Smith et al. 2004). The original size of the NER was inadequate to accommodate the thousands of elk that gathered in Jackson Hole early in the 20th Century (Craighead 1952, Smith et al. 2004). The feeding program modified their behavior by habituating elk to feedgrounds and adjacent environs, creating less uniform distribution of elk across the landscape, and altering migratory patterns (Craighead 1952, Smith 2001). It could be argued that limiting elk movements and migrations may reduce the chance of disease transmission among adjacent wildlife herds and livestock. Yet, thousands of elk winter off feedgrounds in the Jackson herd unit (Lubow and Smith 2004, USDI 2005) and some elk that use feedgrounds currently interchange with adjacent herds.

Table 2. Summary of key elements of alternatives 4 and 6 compared to present conditions or the no action alternative, from USDI 2005*b*.

Element	Current conditions	Alternative 4	Alternative 6
Elk on the NER	Maximum 7,500	4,000-5,000: phased in	Maximum 2,400-3,200
Elk on GTNP	1/3 NER numbers	1,300-1,600	No target, ≈ 1,200-1,600
Bison on NER and GTNP	800-1,000+, uncontrolled size	450-500	Average 400
Elk Hunt on NER and GTNP	Yes	Yes	Yes
Bison Hunt NER	No	Yes	Yes
Winter Feeding on NER	Feed 9 of 10 yrs; 70 days/yr	Feed 5 of 10 yrs; phased in over 15 years	Transition to native range (no feeding) in 5 yrs.
Migration	None	Limited increased winter distribution	Natural migration could occur
Use Brucellosis Vaccines on NER	Temporary S19 elk vaccination would end	WGFD use S19 on elk; bison when effective vaccine found	Vaccines not used until found effective (oral for elk)
Transition to Winter Range to Address Disease Prevalence/Risks	No action	Transition in years when feeding does not occur	Transition completely to winter range use within 5 years

I agree with the rankings in the BEMP that Alternative 6 goes much farther than does the plan's preferred Alternative 4 toward achieving the disease management goal (USDI 2005:82, 257), which should include limiting the influence of documented and potential disease incursions on wildlife. Alternative 6 calls for populations of elk and bison managed nearer estimated habitat carrying capacities, phasing out winter feeding, and vaccinations only after improved technology warrants their use against brucellosis. A change in philosophy to managing elk and bison populations within habitat carrying capacity and reliance on natural habitat and forage will not guarantee that brucellosis will be eliminated or diminished to insignificant levels in the Jackson herds. However, it appears certain that the decades-long practices of high population densities, supported by annual feeding in winter, have only served to perpetuate brucellosis and led to transmission of *B. abortus* to cattle herds and loss of Wyoming's brucellosis free status. Consequently, the USDA Animal and Plant Health Inspection Service submitted comments to USDI, during the interagency review period in 2005, in support of

Alternative 6. That letter states, "Alternative 6 provides more risk mitigation and management options which will lower the risk of major adverse impacts that brucellosis and non-endemic, infectious diseases will continue to cause for the elk, bison, and/or livestock populations." The letter continues, "Moreover, the implementation of Alternative 6 would result in a lower prevalence of brucellosis in the long term as compared to the other alternatives presented."

The negative effects of winter feeding (Smith 2001, Dunkley and Cattet 2003, Van Deelen 2003), especially exacerbating disease prevalence and susceptibility, would seem to run counter to the disease management goal of the BEMP (USDI 205:34), and sustaining healthy populations of wildlife (USDI 2005:33). Alternative 4 falls short in terms of remedying excessive elk and bison densities in winter, which are at the root of the disease shedding-transmission-infection cycle. Alternative 4 would continue to reinforce elk and bison to crowd onto the NER each fall in anticipation of hay handouts. To break this pattern, periodic reinforcement is not perpetuated under Alternative 6. The BEMP acknowledges the disease liabilities associated with the preferred alternative.

Alternative 4 also calls for continuation of Strain 19 vaccination of elk. Vaccination programs designed to eliminate or greatly reduce brucellosis in feedground elk have arguably failed to reduce disease prevalence, certainly to levels of 0-3% found in elk that do not use winter feedgrounds. Ballistic or hand vaccination requires that elk be baited or fed for ready access. Roffe et al. (2004) succinctly put into context the danger of therapeutic approaches to wildlife disease management, "Even if long-term vaccination was part of a successful program to eventually eliminate brucellosis, this type of management could contribute to maintenance or spread of other diseases. Persisting with this management paradigm could severely hamper our ability to respond to new wildlife disease incursions, especially those for which effective vaccines are nonexistent."

As I noted in my review of winter feeding of elk in western North America (Smith 2001), "Winter feeding of elk can be viewed as a means of conflict resolution, generally spawned by intense public pressure. It is not based on scientific principle and sustainable resource management policy. Administrators may see winter feeding as the least painful remedy for producing immediate results to appease differing groups: agricultural interests that desire rapid resolution to crop damage, and pro-wildlife constituencies that oppose reductions in elk populations despite wildlife-human conflict or dwindling habitat." Confined to those arenas, winter feeding of elk arguably has been a success at the NER and elsewhere. However, enter infectious, transmissible disease and the winter feeding solution creates more problems than it solves. It is this issue, diseases of ecological and socioeconomic consequence, which will unavoidably navigate decision-makers toward a new management philosophy in Jackson Hole. It will either happen proactively, or regrettably after the incursion of CWD, bovine TB, or some other intolerable disease.

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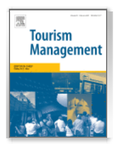

Feeding wildlife as a tourism attraction: a review of issues and impacts

Mark B. Orams

Coastal-Marine Research Group, Massey University at Albany, Private Bag 102 904, North Shore MSC, New Zealand

Received 6 July 2000, Accepted 18 May 2001, Available online 30 October 2001.

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Abstract

The feeding of wildlife has become a popular means by which tourists and tourism operators can facilitate close observation and interaction with wildlife in the wild. These practices are widespread and have a variety of impacts on the wildlife—and on the tourists. Deliberate and long-term provision of food to wildlife has been shown to alter natural behaviour patterns and population levels. It has also resulted in the dependency of animals on the human provided food and their habituation to human contact. Intra- and inter-species aggression has also occurred where wildlife, in their efforts to obtain food, have harmed one another and harmed tourists. There are also important health implications arising from artificial food sources where injury and disease have resulted. While the great majority of cases show negative impacts arising from supplemental feeding of wildlife, this is not always the case. Certainly there are psychological, social and economic benefits that are experienced on the human side of the interaction and, in a limited number of cases, the wildlife can be shown to have benefited as well. The issue of feeding wildlife for tourism is a controversial one with little consensus regarding how it should be managed. Approaches range from complete prohibition, to active promotion and management, to simply ignoring the practices. Little empirical research, inconsistent management and differing views of the role of animals in humans' lives ensure that this issue will remain a contentious one worthy of further examination and consideration.

Previous article in issue

Next article in issue

Keywords

Wildlife; Animals; Provisioning; Food; Tourism; Ecotourism; Impacts; Management

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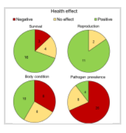
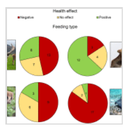

Biological Conservation
Volume 204, Part B, December 2016, Pages 163-174

Review

Wildlife health and supplemental feeding: A review and management recommendations

Maureen H. Murray [a], Daniel J. Becker [b, c], Richard J. Hall [b, c, d], Sonia M. Hernandez [a, e]

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Highlights

- Studies on wildlife health with provisioning spanned 68 species in 35 countries.
- Feeding negatively affected health through higher contact rates, stress, and contaminants.
- Provisioning by tourists was most often associated with negative health outcomes.

Abstract

Humans provide supplemental food to wildlife under many contexts, ranging from professional feeding areas for game species to backyard bird feeders. Such resources benefit wildlife by providing reliable resources during periods of food shortages, but may also alter the risk of pathogen transmission and development of disease. While several reviews have summarized the detrimental effects of supplemental food on infection risk, we conducted a comprehensive review to quantify support for mechanisms by which intentional wildlife feeding influences host condition (i.e. malnutrition and stress) and pathogen transmission on a global scale and provide a framework to mitigate these risks. We also examined whether the purpose of feeding, whether for game management, conservation, tourism, or in residential areas, influenced health outcomes. We found 115 studies that evaluated the health of wildlife with supplementary feeding, representing 68 species in 35 countries, although nearly half (46% of studies) were from North America. Supplemental feeding tended to increase the risk of pathogen transmission by increasing contact rates between hosts (95%) and promoting pathogen accumulation at feeders or the surrounding environment (77%). Provisioned food was also often a source of immunosuppressive contaminants (80%). Feeding associated with tourism frequently increased wildlife stress, rates of injury, pathogen prevalence, or malnutrition (85%), while feeding for conservation purposes had mostly positive effects on wildlife health (63%). We recommend adopting feeding practices that validate the nutritional appropriateness of wildlife feed for the target species, make food available at lower densities for short periods at unpredictable times and places to prevent aggregation, and avoid feeding during times of migration, pulses of new recruits, and epidemics. These strategies will help retain the recreational and management benefits of wildlife provisioning while mitigating negative effects for many species around the world.

Previous article in issue | Next article in issue

Keywords

Supplemental feeding; Provisioning; Wildlife disease; Pathogen transmission; Fitness; Nutrition

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ARF-7624 **2. C.**

Work Session

Meeting Date: 10/25/2022
Submitted For: Mary Springer, Finance Director
Submitted By: Mary Springer, Finance Director
Department: Finance

Information

Request/Subject

Information and Discussion to review revised Policy No. BOS-FIN-113 - *Procurement*

Background Information

Procurement Policy BOS-FIN-113 was last revised on April 20, 2021. The newest revisions include local preference changes for contract awards when vendors submit identical pricing for requests for bids. Additionally, the revised policy clarifies the process when using cooperative contracts and corrects typographical errors.

Evaluation

N/A

Conclusion

N/A

Recommendation

N/A

Suggested Motion

Information/Discussion regarding revised Policy No. BOS-FIN-113 - *Procurement*. **(Mary Springer)**

Attachments

BOS-FIN-113 Procurement Policy Revised

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1. LEGAL AUTHORITY

The Gila County Board of Supervisors (the "Board") in accordance with A.R.S. §11-254.01 adopts this Procurement Policy (the "Procurement Policy") in compliance with the uniform accounting system prescribed by the auditor general under A.R.S § 41-1279.21.

2. PURPOSE

A. This Procurement Policy provides for a uniform system of control to enhance accountability and transparency and increase public confidence in Gila County (the "County") procurement. The Procurement Policy identifies procedures for the acquisition of supplies and services, including construction, research and development, architect-engineer and commercial items. This Procurement Policy applies to expenditure of public funds irrespective of funding source, including state and federal assistance monies. The County shall comply with terms and conditions of any grant, gift, bequest, cooperative agreement, or federal or state guideline. In those cases where this Procurement Policy does not address a procurement situation, the Arizona State Procurement Code found in Title 41, Chapter 23 of the Arizona Revised Statutes will be followed.

B. This is a general guide to the supplier selection techniques and level of competition required for procurement by the County in compliance with the Arizona Revised Statues and are generally based upon the dollar value (threshold) of the estimated or projected dollar amount of the entire procurement.

C.

Type	Dollar Amount	Supplier Selection Method
Under Existing Vendor Contract	Any Amount	No competition required. May request level of effort costs from several contracted vendors and accept the lowest estimate.
Small Dollar Procurement	$0.01 to <$5,000	Use adequate and reasonable competition. May use County credit card as payment method.
Informal Solicitations	$5,000 to <$100,000	A minimum of three documented written quotes required. May use County credit card as payment method.
Formal Solicitations	More than $100,000	Formal Bid Process

3. SUPPLEMENTARY GENERAL PRINCIPLES OF LAW APPLICABLE

A. Unless expressly provided otherwise by a particular provision of this Procurement Policy, the principles of law and equity, including the Uniform Commercial Code as adopted by the State of Arizona, the common law of contracts as applied in the state of Arizona and law relative to agency, fraud, misrepresentation, duress, coercion and mistake or other applicable laws supplement the provisions of this Procurement Policy.

4. REQUIREMENT OF GOOD FAITH

A. This Procurement Policy and the Uniform Commercial Code adopted by the State of Arizona requires all parties involved in the negotiation, performance, or administration of County contracts to act with utmost good faith.

5. PROCUREMENT ETHICS

A. It is the policy of the County to promote the County's reputation for courtesy, fairness, impartiality, integrity, service economy, and government by law. The responsibility for implementing this Procurement Policy rests with each individual who participates in the procurement process, including the using department, suppliers, and procurement staff.

1. Employee Ethics

   a. No County employee, having official responsibility for a procurement transaction, shall represent the County in that transaction when the employee is contemporaneously employed by a bidder, offeror or contractor involved in the procurement transaction.

   b. The employee, or any member of the employee's immediate family holds a position with a bidder, offeror or contractor such as an officer. director, trustee or partner, has a personal and substantial participation in the transaction, or owns or controls more than five (5%) of the firm.

   c. The employee, or any member of the employee's immediate family has a pecuniary interest arising from the transaction.

   d. The employee or any member of the employee's immediate family is ~~negotiating, or~~negotiating or has an arrangement concerning prospective employment with a bidder, offeror or contractor.

e. No employee having official responsibility for a procurement transaction shall solicit, demand, accept, or agree to accept any payment, loan, subscription, advance deposit of money, services, entertainment, gift or anything of more than a nominal value from any bidder, offeror, contractor or subcontractor.

2. Vendor Ethics

a. No bidder, offeror, contractor or subcontractor shall confer upon any public employee having official responsibility for a procurement transaction any payment, loan, subscription, advance deposit of money, services or anything of more than nominal value, present or promised.

b. No bidder, offeror, contractor or subcontractor shall give, demand or receive from any supplier, subcontractor, or competitor any bribe, kickback, or anything of value in return for participation in a procurement transaction or agreeing not to compete in a transaction.

c. Reporting of Anticompetitive Practices. If for any reason collusion or other anticompetitive practices are suspected among any bidders or offerors, a notice of the relevant facts shall be transmitted to the Procurement Officer and the County Attorney. This section does not require a law enforcement agency to investigate such practices to convey such notice to the Procurement Officer.

6. CONFIDENTIAL INFORMATION

A. Confidential information shall be designated as follows:

1. If a person or legal entity (the "Disclosing Party") asserts that a bid, proposal, offer, specification, or protest contains trade secret or other proprietary information (the" Confidential Information") should be held in confidence by the County, the Disclosing Party shall include a statement with the submission supporting the assertion and advising the Procurement Officer or his/her designee of this fact. In addition, the Disclosing Party shall clearly mark any Confidential Information disclosed as "Confidential" wherever it appears. In no event shall contract terms and conditions, pricing, and information generally available to the public be considered Confidential Information.

2. The Confidential Information identified by the Disclosing Party as Confidential may not be disclosed until the Procurement Officer or designee makes a written determination.

3. The Procurement Officer or designee shall review the statement and the Confidential Information and determine in writing whether the Confidential Information shall be retained by the County and treated as Confidential Information or returned to the Disclosing Party. In making the determination, the Procurement Officer or designee may consult with the County Attorney. In either case, the Procurement Officer or designee shall inform the Disclosing Party in writing of such determination. Determinations are retained by the Procurement Group.

4. If the Confidential Information is retained by the County, the County shall use reasonable efforts to maintain the secrecy of the Confidential Information and disclose such Confidential Information only to County employees with a need to know for the purposes of evaluating the bid, proposal, offer, specification or protest of the Disclosing Party.

5. At the conclusion of the process (bid, protest or otherwise) for which the Confidential Information was disclosed the Confidential Information shall be returned to Disclosing Party or destroyed at the discretion of the Procurement Officer or designee.

7. AUTHORITY OF THE FINANCE DIRECTOR

A. The Finance Director shall serve as the Procurement Officer for the County and shall be responsible for the following:

1. The purchase, renting, leasing or otherwise acquiring of all materials, services and construction, including all functions that pertain to the obtaining of any material, service or construction, including description of requirements, selection and solicitation of sources, preparation and award of contract, and all phases of contract administration.

2. Establishment of policies and procedures for the management of all inventories of materials.

3. The sale, trade, or disposal of surplus materials belonging to the County in in compliance with A.R.S. §11-251(9).

4. Establish and maintain programs for the inspection, testing and acceptance of materials, services and construction.

5. Supervise the County Procurement Group (the "Procurement Group") consisting of employees within the County that generally performs the following functions:

   a. Research and request bid proposals and maintain vendor relationships to facilitate the preparation of all contractual agreements on behalf of the County;

   b. Work with and supports all elected offices and departments within the County;

   c. Operate as the point through which all County contracts will be processed to ensure proper administrative review prior to being submitted to the Procurement Officer, County Attorney's Office, County Manager or Board for approval.

   d, Maintenance of a central file for all County contracts under an indexing system that will provide positive identification of all documents and facilitate document retrieval.

6. Delegate procurement authority to designees within the Procurement Group or other County governmental departments as may be required at the discretion of the Procurement Officer, provided that the delegation or any modification of authority shall be in writing and shall specify:

   a. The scope and type of authority delegated or modified;

   b. Any limits or restrictions on the exercise of the delegated authority; and

   c. The duration of the delegation.

8. SOURCE SELECTION & CONTRACT FORMATION

A. In accordance with A.R.S. § 41-2535 paragraphs A though D, except as otherwise provided hereafter in paragraph C. (Sole Source Procurement); paragraph D. (Emergency Procurements); paragraph E. (Other Non-Procurement Contracts); and paragraph F. (Professional Services), all purchases of supplies, materials, equipment and contractual services, except professional services, made by the County having an estimated cost of more than One Hundred thousand ($100,000) dollars per transaction shall be based on sealed, competitive bids.

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B. Competitive Sealed Bidding or Competitive Sealed Proposals

1. Invitation for Bids or Proposals. An Invitation for Bids shall be issued and shall include specifications, any applicable evaluation criteria, and all contractual terms and conditions specifically applicable to the procurement. Standard contractual terms and conditions may be included within the solicitation document or incorporated by reference.

2. Public Notice. Adequate public notice of the Invitation for Bids shall be given not less than twenty-one (21) days prior to the date set forth therein for the opening of bids. A shorter time may be deemed necessary for a procurement as determined in writing by the Procurement Group. The public notice shall state the place, date, and time of bid opening. Notice of the Invitation for Bids shall be posted on the County website, and a copy of the invitation for bids shall be available for public inspection.

3. Late Bids. A bid is late if it is received at the location designated in the Invitation for Bids after the time and date set for bid opening. The Procurement Group shall designate the governing clock. A late bid shall be rejected. A late bid shall not be opened except for, if necessary, identification purposes. Such bids shall be returned to the bidder. Bidders submitting bids that are rejected as late shall be so notified.

4. Bid Opening. Bids shall be opened publicly in the presence of one or more witnesses at the time and place designated in the Invitation for Bids. The amount of each bid and such other relevant information as the Procurement Officer deems appropriate, together with the name of each bidder, shall be recorded. In the event no attendees are present for bid opening, the sealed bids shall be opened by the Procurement Group and a “bid” or “no bid” may be recorded on the tabulation sheet. The bid may then be given to the appropriate person for recording. The attendance sheets shall indicate that there were no attendees present. Bids shall not be open for public inspection until after a contract is awarded. After contract award, the bids shall be available for public inspection, except to the extent that the withholding of information is permitted or required by law.

5. Bid Acceptance and Bid Evaluation. Bids shall be unconditionally accepted without alteration or correction, except as authorized in this Procurement Policy. Bids shall be evaluated based on the requirements set forth in the Invitations for Bids, which may include criteria to determine acceptability such as inspection, testing, quality, workmanship, delivery and suitability for a particular purpose. The Invitation for Bids shall set forth the evaluation

criteria to be used. No criteria may be used in bid evaluation that is not set forth in the Invitation for Bids.

6. Discussion with Offerors. Discussions may be conducted with responsible offerors.

7. Negotiations with Responsible Offerors and Revisions to Proposals. Negotiations may be conducted with responsible offerors. Offerors shall be accorded fair and equal treatment in conducting negotiations and there shall be no disclosure of any information derived from proposals submitted by competing offerors.

   a. Concurrent Negotiations. Negotiations may be conducted concurrently with responsible offerors for the purpose of determining source selection and/or contract award.

8. Exclusive Negotiations. Exclusive negotiations may be conducted with the responsible offeror whose proposal is determined in the selection process to be most advantageous to the County. Exclusive negotiations may be conducted subsequent to concurrent negotiations or may be conducted without requiring previous concurrent negotiations. Exclusive negotiations shall not constitute a contract award, nor shall it confer any property rights to the successful offeror. If exclusive negotiations are conducted and an agreement is not reached, the County may enter exclusive negotiations with the next highest ranked offeror without the need to repeat the formal solicitation process.

9. Evaluation of Proposals

   a. Selection Committee. The Procurement Officer or designee shall appoint a selection committee to evaluate the proposals and make a recommendation based on the criteria set forth in the request for proposals. No other factors or criteria may be used in the evaluation.

10. Correction or Withdrawal of Bids; Cancellation of Awards. Correction or withdrawal of inadvertently erroneous bids before or after bid opening, or cancellation of awards or contracts based on such bid mistakes, may be permitted where appropriate. Mistakes discovered before bid opening may be modified or withdrawn by written notice received in the Procurement Group prior to the time set for bid opening. After bid opening, corrections in bids shall be permitted only to the extent that the bidder can show by clear and convincing evidence that a mistake of a nonjudgmental character

was made, the nature of the mistake, and the bid price actually intended. After bid opening, no changes in bid prices or other provisions of bids prejudicial to the interests of the County or fair competition shall be permitted. In lieu of bid correction, a low bidder alleging a material mistake of fact may be permitted to withdraw its bid if:

a. The mistake is clearly evident on the face of the bid document, but the intended correct bid is not similarly evident; or

b. The bidder submits evidence that clearly and convincingly demonstrates that a mistake was made. All decisions to permit the correction or withdrawal of bids, or to cancel awards or contracts based on bid mistakes, shall be supported by a written determination made by the Procurement Officer.

11. Contract Awards

a. Contract awards shall be made by the County Manager or designee for those contracts under $50,000.00, or if above $50,000.00 by the Board, to the responsible offeror whose proposal is determined in writing to be the most advantageous to the County taking into consideration price and the other evaluation criteria set forth in the request for proposals.

b. The contract file shall contain the basis on which the award is made.

c. Contracts that are awarded with Federal grant funding shall require a search for debarment prior to contract award. The search shall be conducted on the System for Award Management, https://sam.gov/content/exclusionshttps://sam.gov/portal/SAM/#1#1.

d. General. The contract shall be awarded by appropriate notice to the lowest responsible and responsive bidder whose bid conforms in all material respects to the requirements and criteria set forth in the Invitation for Bids.

e. Contract Award Based on Best Value. The contract may be awarded on best value analysis provided that the criteria for analysis were included in the Invitation for Bids. The contract shall be awarded by appropriate written notice to the response bidder determined to be the best value to the County and whose bid conforms in all material

respects to requirements and criteria set forth in the Invitation for Bids.

f. Exceeding Available Funds. In the event the low responsive and responsible bid for a construction project exceeds available funds and such bid does not exceed such funds by more than five (5%) percent, the Procurement Officer or designee is authorized, when time or economic considerations preclude re-solicitation of work of a reduced scope, to negotiate an adjustment of the bid price with the low responsive and responsible bidder, in order to bring the bid within the amount of available funds.

g. Public Record. After the County approves a contract execution, the bids shall be available for public inspection.

h. Low Tie Bids. If there are two or more low responsive bids from responsible bidders that are identical in price and that meet all of the requirements and criteria set forth in the Invitation for Bids, preference may be given to the bidder who's business resides in Gila County, if no local bidders submitted bids, then award may be made by random selection in a manner prescribed by the Procurement Officer.

i. Each month a report will be compiled by the Finance Department for contracts signed by the County Manager under $50,000.00 and presented to the Board on the consent agenda in the following month regularly scheduled Board meeting.

C. Sole Source Procurement. A contract may be awarded without competition when the Procurement Officer determines in writing, after conducting a good faith review of available sources, that there is only one source for the required material, service or construction item. The requesting department shall provide written evidence to support a sole source determination. The Procurement Officer may require that negotiations are conducted as to price, delivery and terms. The Procurement Officer may require the submission of cost or pricing data in connection with an award under this section. Sole source procurement shall be avoided, except when no reasonable alternative sources exist, or time is of the essence.

D. Emergency Procurements. The Procurement Officer may make or authorize others to make emergency procurements of materials, services or construction items when there exists a threat to public health, welfare, property or safety or if a situation exists which makes compliance contrary to the public interest; provided that such emergency procurements shall be made with such competition as is

practicable under the circumstances. An emergency procurement shall be limited to those materials, services or construction necessary to satisfy the emergency need. A written determination of the basis for the emergency and for the selection of the particular contractor shall be included in the contract file.

E. Other Non-Procurement Contracts. The County may enter into other types of contractual arrangements which do not involve the acquisition of materials, services, equipment or construction. The County Manager or designee may approve these contracts if they do not obligate the County for more than two (2) years or involve expenditures to the other party of more than $50,000.00. Examples of contractual arrangements include but are not limited to:

1. Acquisition and leasing of interests in real property
2. Subordination agreements
3. Lien Releases
4. Franchises
5. Licenses
6. Software license agreements
7. Use permits
8. Revenue agreements
9. Excise tax certification

F. Professional Services. Professional services are those services rendered by a person/firm engaging in a recognized discipline that necessarily requires advanced training and specialized knowledge to perform. Such services typically result from the predominant use in intellectual skills rather than physical skills. Professional services for the purposes of this Procurement Policy include but are not limited to:

1. Attorneys
2. Contractual services used by counties when issuing bonds, including consultants, underwriters, and bond servicing companies
3. Architects
4. Court reporters
5. Physicians, nurse practitioners, physical therapists
6. Mental health therapists and psychiatrists
7. Engineers

8. Land surveyors
9. Geologists
10. Hydrologists
11. Real estate appraisers
12. Financial advising services
13. Auditors, except for the State Auditor General

As authorized by A.R.S. § 41-2581, the contract for professional services may be awarded without competitive bids pursuant to the following policies:

a. The Procurement Officer shall encourage persons or firms engaged in the lawful practice of the professional services listed above desiring to provide the services to the County submit annually a statement of qualifications and experience on a prescribed form which shall include, but not be limited to the following information:

- Technical education and training;
- General or special experience, certifications, licenses, and memberships in professional associations, societies, or boards; and;
- Any other relevant information requested by the purchasing agency.

b. Persons or firms who have submitted statement of qualifications may submit additional information or change information that was previously submitted at any time.

c. A County department requiring professional services will prepare a scope of work and purchase requisition and forward it to the Procurement Officer for processing. Based on the scope of work and the professional services required, the Procurement Officer shall provide a notice of the need for such professional services to persons or firms who have submitted statement of qualifications for those professional services. The Procurement Officer or designee of such officer may conduct discussions with any offerors who submit a proposal to provide the professional services to determine the offeror's qualifications for further consideration. Discussions shall not disclose any information derived from proposals submitted by other

offerors.

d. The contract award shall be made to the offeror determined in writing by the Procurement Officer to be best qualified based on the evaluation factors set forth in the request for qualifications and after a written determination that the compensation is fair and reasonable. Selection may be made pursuant to the provisions of this section without requiring pricing proposals, but if price is included in proposals submitted, no contract may be awarded solely on the basis of price.

G. Cancellation of Solicitations

1. Cancellation of Solicitation. An invitation for bids, a request for proposals, a request for qualifications or other solicitation may be cancelled, or any or all bids, proposals or statement of qualifications may be rejected in whole or in part as may be specified in the solicitation, when it is in the best interests of the County. Each solicitation issued by the County shall state that the solicitation may be cancelled and that any bid, proposal or statement of qualification may be rejected in whole or in part when in the best interests of the County.

2. Prior to Opening

a. As used in this Section, "opening" means the date and time set for opening of bids, receipt of statements of qualifications or receipt of proposals in competitive sealed proposals.

b. Prior to opening, a solicitation may be cancelled in whole or in part when the Procurement Group determines in writing that such action is in the County's best interest for reasons including but not limited to:

1) The County no longer requires the materials, services, or construction;

2) The County no longer can reasonably expect to fund the procurement; or

3) Proposed amendments to the solicitation would be of such magnitude that a new solicitation is desirable.

c. When a solicitation is cancelled prior to opening, notice of cancellation shall be sent to all persons solicited.

d. The notice of cancellation shall:

1) Identify the solicitation;

2) Briefly explain the reason for cancellation; and

3) Where appropriate, explain that an opportunity will be given to compete on any re-solicitation or any future procurements of similar materials, services or construction.

3. After Opening

a. After opening but prior to award, all bids, proposals or requests for qualifications may be rejected in whole or in part when the Procurement Officer or designee determines in writing that such action is in the County's best interest for reasons including but not limited to:

1) The materials, services, or construction being procured are no longer required;

2) Ambiguous or otherwise inadequate specifications or scopes of work were part of the solicitation;

3) The solicitation did not provide for consideration of all factors of significance to the County;

4) Prices exceed available funds and it would not be appropriate to adjust quantities to come within available funds;

5) All otherwise acceptable bids, statements of qualifications or proposals received are at clearly unreasonable prices; or

i. There is reason to believe that the bids, statements of qualifications or proposals may not have been independently arrived at in open competition, may have been collusive, or may have been submitted in bad faith. A notice of rejection shall be sent to all persons that submitted bids, statements of qualifications or proposals.

ii. If all bids, proposals, or request for qualifications are rejected, all bids, proposals or statements received shall remain, to the extent possible, confidential.

4. Documentation. The reasons for cancellation or rejection shall be made a part of the procurement file and shall be available for public inspection.

H. Rejection of Individual Bids, Proposals or Statements of Qualifications

1. A bid or proposal may be rejected if:

   a. The bidder is determined to be non-responsible;

   b. The bid is nonresponsive;

   c. The proposed price, unless prohibited, is unreasonable; or

   d. It is otherwise not advantageous to the County.

2. Reasons for rejection shall be provided to the unsuccessful bidders or offerors.

I. Responsibility of Bidders and Offerors

1. Factors to be considered in determining if a prospective bidder or offeror is responsible include:

   a. The proposed bidder or offeror 's financial, physical, personnel or other resources, including subcontracts;

   b. The proposed bidder or offeror's record of performance and integrity;

   c. Whether the proposed bidder or offeror is qualified legally to contract with the County; and

   d. Whether the proposed bidder or offeror supplied all necessary information concerning its responsibility;

   e. Whether the proposed bidder or offeror is currently on a debarment list.

2. The Procurement Officer or designee may establish specific responsibility criteria for a particular procurement. Any specific responsibility criteria shall be set forth in the solicitation.

3. Determination of Non-responsibility. If a bidder or offeror who otherwise would have been awarded a contract is found non-responsible, a written finding of non-responsibility, setting forth the basis of the finding, shall be prepared by the Procurement Officer. The unreasonable failure of a bidder or offeror to promptly supply information in connection with an inquiry with respect to responsibility may be grounds for a finding of non-responsibility

with respect to such bidder or offeror. The final determination shall be made part of the contract file and be made a public record.

J. Bid and Contract Security, Material or Service Contracts

1. The Procurement Officer or designee may require the submission of security to guarantee faithful bid and contract performance. In determining the amount and type of security required for each contract, the Procurement Officer or designee shall consider the nature of the performance and the need for future protection to the County. The requirement for security must be included in the invitation for bids or request for proposals. Failure to submit security in the amount and type of security required may result in the rejection of the bid, statement of qualifications or proposal.

K. Contract Term

1. Subject to the following guidelines, unless otherwise provided by law, a contract for materials or services may be entered into for any period of time deemed to be in the best interest of the County, if the term of the contract and conditions of renewal or extension, if any, are included in the solicitation and monies are available for the first fiscal period at the time of contracting. Payment and performance obligations for succeeding fiscal periods are subject to the availability and appropriation of monies.

   a. Contracts for materials and services shall have a specific term (date of commencement and expiration date).

   b. A contract that does not exceed one (1) year may be approved by the County Manager or designee, if it is also for a contract amount less than $50,000.

   c. A contract that exceeds one (1) year in duration shall be approved by the Board and should not obligate the County for more than four (4) years.

   d. Contracts between the County and a state or federal agency using a contract form that was developed by that agency and that the agency uses in its ordinary course of business may be for longer than four (4) years and will not require separate Board approval.

e. With Board approval, other contracts may exceed four (4) years. Examples of such contracts include real-property lease agreements, rights-of-way agreements for utility companies, and contracts that allow the County to use limited financial resources in the most effective and efficient manner. Contracts may have a provision that allows for renewal if the County has the option not to renew.

2. Prior to use of a multi-term contract, it shall be determined that:

a. Estimated requirements cover the period of the contract and are reasonably firm and continuing;

b. The contract will serve the best interests of the County by encouraging effective competition or otherwise promoting economies in County procurement.

3. When funds are not appropriated or otherwise made available to support continuation of performance in a subsequent fiscal year, the contract may be cancelled by the County and the contractor may be reimbursed for the reasonable value of any nonrecurring costs incurred but not amortized in the price of the supplies or services delivered under the contract.

L. Right to Inspect. The County may, at reasonable times, inspect the part of the plant or place of business of a contractor, consultant or any subcontractor or sub-consultant that is related to the performance of any contract awarded or to be awarded by the County.

M. Right to Audit Records

1. The County may, at reasonable times and places, audit the books and records of any person who submits cost or pricing data to the extent that the books and records relate to the awarded contract. Any person who receives a contract, change order or contract modification for which cost or pricing data is required shall maintain the books and records that relate to the cost or pricing data for three years from the date of final payment under the contract, unless a shorter period is otherwise authorized in writing by the Procurement Officer.

2. The County is entitled to audit the books and records of a contractor, consultant or any subcontractor or sub-consultant under any contract or subcontract to the extent that the books and records relate to the

performance of the contract or subcontract. The books and records shall be maintained by the contractor for a period of five (5) years from the date of final payment under the prime contractor or consultant, and by the subcontractor or sub-consultant for a period of five (5) years from the date of final payment under the subcontract, unless a shorter period is otherwise authorized in writing by the Procurement Officer.

N. Prospective Vendors Lists

1. The Procurement Group shall maintain a prospective vendors list. Inclusion of the name of a person shall not indicate whether the person is responsible concerning a particular procurement or otherwise capable of successfully performing a County contract.

2. Persons desiring to be included on the prospective vendors list may notify the Procurement Group or may register with the Procurement Group in-person. The Procurement Group may remove a person from the prospective vendors list if it is determined that inclusion is not advantageous to the County.

3. It shall be the vendor's sole responsibility to ensure that vendor registration information is current and active.

O. Contract Form and Execution. All contracts and amendments, regardless of value shall be approved by the appropriate authority in the County prior to authorization to proceed. All contracts entered into under this Procurement Policy shall be executed in the name of the County by the County Manager or designee for contracts under $50,000.00 or if above $50,000.00 by the Board. The County Manager or designee may execute an amendment to any contract initially approved by the Board as long as the amendment does not alter the scope of the contract or the monetary commitment of the original Board award.

1. Grant Contracts. Grant Contracts due to the various complexities and time requirements, often necessitate immediate approval to take advantage of available funds. Based on the requirements/restrictions imposed by the grantor it may not always possible to follow the approved Procurement Policy. As such, grant contracts may be expedited by requesting that, with the approval of the Procurement Officer and County Manager, the Chairman of the Board of Supervisors execute the contract to be subsequently ratified by the Board, regardless of value. Grant applications submitted and approved by the County Manager which automatically become contracts must be submitted to the Board of Supervisors for ratification.

P. Assignment of Rights and Duties - The rights and duties of a County contract are not transferable or otherwise assignable without the written consent of the Procurement Officer.

9. SPECIFICATIONS

A. Maximum Practicable Competition

1. All specifications shall seek to promote overall economy for the purposes intended and encourage competition in satisfying the County's needs and shall not be unduly restrictive.

   a. To the extent practicable and unless otherwise permitted by this Procurement Policy, all specifications shall describe the County's requirements in a manner that does not unnecessarily exclude a material, service or construction item.

   b. Proprietary specifications shall not be used unless the Procurement Officer determines in writing that such specifications are required by demonstrable technological justification and that it is not practicable or advantageous to use a less restrictive specification. Past success in the material's performance, traditional purchasing practices or inconvenience of drawing specifications do not justify the use of proprietary specifications.

2. When practicable, the County shall use accepted commercial specifications and shall procure standard commercial materials.

3. Brand Name

   a. A brand name or equal specification may be used when the Procurement staff determines that use of brand name or equal specifications is advantageous to the County.

   b. A brand name specification may be prepared and utilized only if the Procurement staff makes a written determination that only the identified brand name item will satisfy the County's needs.

10. PROCUREMENT OF CONSTRUCTION

A. All contracts entered into under this section ~~13.10~~ shall be executed in the name of the County by the County Manager for contracts under $50,000.00 or if above

$50,000.00 by the Board in accordance with the requirements of A.R.S. §Title 34 and this Procurement Policy.

B. Procurement of Construction. Contracts for construction shall be solicited through a competitive sealed bid process for the procurement of Construction Services, Small Purchases, Sole Source Procurement, Emergency Procurements and Special Procurements in accordance with the requirements of A.R.S. §Title 34 and this Procurement Policy.

C. Procurement of Professional Design Services. Contracts for professional design services with an estimated contract amount not to exceed ($250,000) shall be solicited through a request for qualifications Small Purchases, Sole Source Procurement, Emergency Procurements, Special Procurements, and Direct Selection of Pre-Qualified Technical Registrants

D. Procurement of Construction Services. Contracts for construction services shall be solicited through a build, design- build, and construction-manager-at-risk or job-order-contracting selection process utilizing a request for qualifications Small Purchases, Sole Source Procurement, Emergency Procurement and Special Procurements process.

E. Construction by County Employees. A building, structure, addition or alteration of a public facility may be constructed by the County internal labor force if the cost does not exceed the amount established and adjusted each year in accordance with A.R.S. §34-201 Section 4 Paragraph C(2).

F. Direct Selection of Pre-Qualified Technical Registrants

1. If the procurement is by direct selection, a written determination by the County Engineer citing the basis of award and for the selection of the particular technical registrant shall be included in the contract file. The best interests of the County shall be considered in each instance.

2. The Procurement Group shall maintain a list of technical registrants who are properly licensed with the State of Arizona Board of Technical Registration, that have expressed an interest in performing work for the County and have provided evidence of their professional qualifications for such work. The list may be categorized to reflect the person or firm's primary field of expertise. Persons or firms desiring to be included on the pre-qualified list may notify the Procurement Group or may register with the Procurement Group in-person.

3. The Procurement Officer will notify each person or firm listed on the register annually of their status. An invitation published in the local publication inviting the updating of their professional qualifications.

4. Firms who have failed to provide satisfactory evidence of qualifications or have performed unsatisfactorily during the past twelve (12) months may be removed from the pre-qualified vendor list.

F. Non-substantial Failure to Comply. The Procurement Officer may determine that noncompliance with any provision of this section is non-substantial and may allow for correction or may waive minor informalities or irregularities.

11. CONTRACT CLAUSES

A. Contract Clauses. All County contracts for supplies, services and construction shall include provisions necessary to define the responsibilities and rights of the parties to the contract. The Procurement Group, after consultation with the County Attorney, may issue clauses appropriate for material, service or construction contracts, addressing among others the following subjects:

1. The unilateral right of the County to order in-writing changes in the work within the scope of the contract;

2. The unilateral right of the County to order in writing temporary stopping of the work or delaying performance that does not alter the scope of the contract;

3. Variations occurring between estimated quantities of work in contract and actual quantities;

4. Defective pricing;

5. Liquidated damages;

6. Specified excuses for delay or nonperformance;

7. Termination of the contract for default;

8. Termination of the contract in whole or in part for the convenience of the County;

9. Suspension of work on a construction project ordered by the County;

10. Site conditions differing from those indicated in the contract, or ordinarily encountered, except that a differing site conditions clause need not be included in a contract;

11. When the contract is negotiated;

12. When the contractor provides the site or design; or

13. When the parties have otherwise agreed with respect to the risk of differing site conditions.

B. Price Adjustments.

Adjustments in price resulting from the use of contract clauses shall be computed in one or more of the following ways:

1. The agreement on a fixed price adjustment before commencement of the pertinent performance or as soon as practicable;

2. The modification to the unit prices specified in the contract;

3. The costs attributable to the events or situations under the clauses;

4. In other manner as the contracting parties may mutually agree;

5. In the absence of agreement by the parties, by a unilateral determination by the County of the costs attributable to the events or situations under such clauses with adjustment of profit or fee as computed by the County.

12. COST PRINCIPLES

The Procurement Officer or designee may establish cost principles that will be used to determine the allowable incurred costs for the purpose of reimbursing costs pursuant to written contract provisions that provide for the reimbursement of costs.

A. Price Adjusting

1. A contractor may be required to submit cost or pricing data if any adjustment in contract price is requested to the provisions.

2. Written adjustment of pricing may contain any of the following:

a. The contract price is based on adequate price competition.

b. The contract price is based on established catalogue prices or market prices.

c. Contract prices are set by law or regulation.

13. LEGAL AND CONTRACTUAL REMEDIES

A. Right to Protest Solicitations and Contract Awards. Any actual or prospective bidder, respondent, offeror or contractor who is aggrieved in connection with the solicitation or award of a contract may file a protest with the Procurement Officer and appeal the protest decision of the Procurement Officer to the County Manager.

B. Resolution of Protests. The Procurement Officer shall have authority to resolve protests.

C. Appeals from the decisions of the Procurement Officer may be made to the County Manager.

D. Filing of a Protest

1. Content of Protest: The protest shall be in writing and shall include the following information:

a. The name, address and telephone number of the protestant;

b. The signature of the protestant or its representative;

c. Identification of the solicitation or contract number;

d. A detailed statement of the legal and factual grounds of the protest including copies of relevant documents; and

e. The form of relief requested.

E. Time for Filing Protests

1. Protests Concerning Improprieties in a Solicitation.

a. Protests based upon alleged improprieties in a solicitation that are apparent before the solicitation due date shall be filed not less than five (5) working days before the solicitation due date.

2. Protests shall be filed within ten (10) days after issuance of notification of award or issuance of notice of intent to award.

3. The Procurement Officer, without waiving the County's right to dismiss the protest for lack of timeliness, may consider any protest that is not filed timely.

4. The Procurement Officer shall give notice of the protest to the successful contractor if award has been made or, if no award has been made, to all interested parties. Interested parties have the right to intervene.

5. Stay of Procurements during the Protest. In the event of a timely protest, the County may proceed further with the solicitation or with the award of the contract unless the Procurement Officer makes a written determination that there is a reasonable probability that the protest will be sustained or that the stay of procurement is not contrary to the substantial interests of the County.

6. Confidential Information

a. Material submitted by a protestant shall not be withheld from any interested party except to the extent that the withholding of information is permitted or required by law.

b. If the protestant believes that the protest contains Confidential Information, the provisions of Section ~~3.6~~6 shall apply.

7. Decision by the Procurement Officer

a. The Procurement Officer shall issue a written decision within fourteen (14) days after a protest has been filed. The decision shall contain an explanation of the basis of the decision. The time for the Procurement Officer's response may be extended for good cause up to thirty (30) calendar days. The Procurement Officer shall notify the protestant in writing that the time for the issuance of a decision has been extended, and the date by which a decision will be issued.

b. The Procurement Officer shall furnish a copy of the decision to the protestant, by certified mail, return receipt requested, or by any other

method including facsimile or electronically, that provides evidence of receipt.

c. If the Procurement Officer fails to issue a decision within the time limits, the protestant may proceed as if the Procurement Officer had issued an adverse decision.

8. Protest Remedies

   a. If the Procurement Officer sustains the protest in whole or part and determines that a solicitation, evaluation process, proposed contract award or contract award does not comply with this Procurement Policy, the Procurement Officer shall implement an appropriate remedy.

   b. In determining an appropriate remedy, the Procurement Officer shall consider all the circumstances surrounding the procurement or proposed procurement including, but not limited to, the seriousness of the procurement deficiency, the degree of prejudice to other interested parties or to the integrity of the procurement system, the good faith of the parties, the extent of performance, costs to the County, the urgency of the procurement and the impact of the relief on the using agency's mission.

   c. An appropriate remedy may include one or more of the following:

      1) Decline to exercise an option to renew under the contract;

      2) Reject all bids, responses or proposals;

      3) Terminate the contract;

      4) Reissue the solicitation;

      5) Issue a new solicitation;

      6) Award a contract consistent with the procurement code; or

      7) Such other relief as is determined necessary to ensure compliance with this Procurement Policy.

9. Appeals to the County Manager

   a. An appeal from a decision entered or deemed to be entered by the Procurement Officer shall be filed with the County Manager within seven (7) days from the date the decision is issued. The appellant shall also file a copy of the appeal with the Procurement Officer.

b. Content of Appeal. The appeal shall contain:

1) Content of the protest;

2) A copy of the decision of the Procurement Officer; and

3) The precise factual or legal error in the decision of the Procurement Officer from which an appeal is taken.

10. Notice of Appeal

a. The Procurement Director shall give notice of the appeal to the successful contractor if award has been made or, if no award has been made, to interested parties. Such interested parties shall have the right to request copies of the appeal and to intervene in the proceedings.

b. The Procurement Officer shall, upon request, furnish copies of the appeal to those interested parties.

11. Stay of Procurement during Appeal. If an appeal is filed during the procurement and before an award of a contract and the procurement or award of the contract was stayed by the Procurement Officer, the filing of an appeal shall automatically continue the stay unless the Procurement Officer makes a written determination that the procurement or award of the contract without delay is necessary to protect substantial interests of the County.

12. Procurement Officer Report. The Procurement Officer shall file a report on the appeal with the County Manager within seven (7) days from the date the appeal is filed. At the same time, the Procurement Officer shall furnish a copy of the report to the appellant by certified mail, return receipt requested, and to any interested parties. The report shall contain copies of:

a. The appeal;

b. Any other documents that are relevant to the protest; and

c. A statement by the Procurement Officer setting forth findings, actions, recommendations and any additional evidence or information necessary to determine the validity of the appeal.

13. Comments on Report

    a. The appellant shall file comments on the Procurement Officer's report with the County Manager within seven (7) days after receipt of the report. Copies of the comments shall be provided by the appellant to the Procurement Director and all other interested parties. The comments must contain a statement or confirmation as to the appellant's requested form of relief.

14. County Manager's Decision on Appeal

    a. After review of the Procurement Officer's report and the appellant's comments, the County Manager shall make a decision on the appeal and notify the appellant in writing of such decision within seven (7) days after the decision. The decision of the County Manager shall provide an explanation of the decision and a response to appellant's requested form of relief. The decision of the County Manager shall be final.

15. Filing of Contract Claims and Controversies

    a. Content of Claim: The claim shall be in writing and shall include the following information:

        1) The name, address and telephone number of the claimant;

        2) The signature of the claimant or its representative;

        3) Identification of the solicitation or contract number;

        4) A detailed statement of the legal and factual grounds of the claim including copies of relevant documents; and

        5) The form of relief requested.

16. Resolution of Contract Claims and Controversies. The Procurement Officer or designee administering a contract in consultation with the County Manager and County Attorney shall have the authority to settle and resolve any contract claims and controversies. If a contract claim or controversy cannot be resolved by mutual agreement of the parties, the County or the contractor may pursue any legal remedy set forth in the contract or authorized by law.

14. DEBARMENT

A. Authority to Debar or Suspend. The Procurement Officer in consultation with the County Manager and County Attorney shall have the authority to debar or suspend a person from participating in County procurements.

B. Initiation of Debarment. Upon receipt of information concerning a possible cause for debarment the Procurement Officer may investigate the possible cause and make a determination. If after investigation, the Procurement Officer has a reasonable basis to believe that a cause for debarment exists, the Procurement Officer may debar a person in accordance with this Procurement Policy.

C. Debarment or suspension causes shall be limited to:

1. Conviction of any person or any affiliate of any person for commission of a criminal offense arising out of obtaining or attempting to obtain a public or private contract or subcontract, or in the performance of such contract or subcontract.
2. Conviction of any person or any affiliate of any person under any statute of the federal government, this state or any other state for embezzlement, theft, fraudulent schemes and artifices, fraudulent schemes and practices, bid rigging, perjury, forgery, bribery, falsification or destruction of records, or receiving stolen property; or any other offense indicating a lack of business integrity or business honesty that currently seriously and directly affects responsibility as a County contractor and which conviction arises out of or obtaining or attempting to obtain a public or private contract or subcontract, or in the performance of such contract or subcontract.

3. Conviction or civil judgment finding a violation by any person or affiliate of any person under state or federal antitrust statutes arising out of the response to a solicitation.

4. Violations of contract provisions within three (3) years of current debarment action, as set forth below, of a character that is reasonably deemed to be so serious as to justify debarment action:

    a. Abandonment of a contract without good cause;

    b. Knowingly fails without good cause to perform in accordance with the specifications or within the time limit provided in the contract; or

c. Failure to perform or unsatisfactory performance in accordance with the terms of one or more contracts, except that failure to perform or unsatisfactory performance caused by acts beyond the control of the contractor shall not be considered to be a basis for debarment.

d. Additionally, any other cause that the Procurement Officer reasonably determines to be so serious and compelling as to affect responsibility as a County contractor, including suspension or debarment of such person or any affiliate of such person by another governmental entity for any cause listed in this section.

D. Matters Not Proper for Debarment or Suspension - any conviction or judgment dated more than three (3) years prior to the notice of suspension or notice of debarment shall not be a basis for any debarment or suspension of a person or an affiliate of a person.

E. Period of Debarment

1. The period of time for a debarment shall not exceed three (3) years from the date of the debarment determination.

2. If debarment is based solely upon debarment by another governmental agency, the period of debarment may run concurrently with the period established by that other debarring agency.

F. Notice. The Procurement Officer shall notify the person in writing within seven (7) days by certified mail, return receipt requested, of the debarment action. The person may submit a request in writing to the Procurement Officer for reconsideration of the debarment action hearing within fourteen (14) days of issuance of the debarment action.

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G. Notice to Affiliates

1. If the Procurement Officer proposes to debar an affiliate, the affiliate shall have a right to provide the Procurement Officer with mitigating circumstances.

2. The affiliate shall advise the Procurement Officer in writing within thirty (30) days of receipt of the notice of a hearing of its intention to appear. Failure to provide written notice of appearance within the thirty (30) day period shall be a waiver of the right to appear in the hearing.

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H. Imputed Knowledge

1. Improper conduct by a person may be imputed to an affiliate for purposes of debarment where the impropriety occurred in connection with the affiliate's duties for or on behalf of, or with the knowledge or approval of, the contractor.

2. The improper conduct of a person or its affiliate having a contract with a contractor may be imputed to the contractor for purposes of debarment where the impropriety occurred in connection with the person's duties for or on behalf of, or with the knowledge, or approval of the contractor.

I. Reinstatement

1. The Procurement Officer may at any time after a final decision on debarment reinstate a debarred person or rescind the debarment upon a determination that the cause upon which the debarment is based no longer exists.

2. Any debarred person may request reinstatement by submitting a petition to the County Manager supported by documentary evidence showing that the cause for debarment no longer exists or has been substantially mitigated.

3. The decision on reinstatement shall be in writing and specify the factors on which it is based.

J. Limited Participation. The Procurement Officer may allow a debarred person to participate in County contracts on a limited basis during the debarment period upon a written determination that participation is advantageous to the County. The determination shall specify the factors on which it is based and define the extent of the limits imposed.

K. Suspension. The Procurement Officer may suspend a person from receiving any award in order to protect the County's interests.

L. Period and Scope of Suspension. The period of suspension shall not be more than sixty (60) days unless the Procurement Officer is informed of compelling reasons to extend the period of suspension.

M. Suspension Notice

1. The Procurement Officer shall notify the person suspended by certified mail, return receipt requested.

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2. The notice of suspension shall state:

   a. The basis for suspension;

   b. The period, including dates, of the suspension; and

   c. That bids or proposals shall not be solicited or accepted from the person and, if received, will not be considered.

N. Master List for Suspension and Debarment.

1. The Procurement Officer or designee shall maintain a Master List of debarments and suspensions.

2. The Master List shall show at a minimum the following information:

   a. The names and vendor number of those persons whom the County has debarred or suspended.

   b. The basis of authority for the action.

   c. The period of debarment or suspension, including the expiration date.

   d. The name of the debarring or suspending agency, if the County's debarment or suspension is based on debarment or suspension by another governmental agency.

3. The Master List shall include a separate section listing persons voluntarily excluded from participation in County contracts.

O. Judicial Review of Protests, Claims or Controversies, Debarments or Suspensions. Any final decision of the Procurement Officer of a protest, claim or controversy, debarment or suspension under this Procurement Policy is subject to judicial review by any party to the proceeding. Exhaustion of the procedures set forth in this Procurement Policy shall be a condition precedent to seeking judicial review and the complaint seeking review shall be filed within thirty (30) days of the final decision. by the Board

P. Exclusive Remedy. With exception to a law to the contrary, this Procurement Policy shall provide the exclusive procedure for asserting a claim or cause of action

against the County arising in relation to any procurement conducted under this Procurement Policy.

15. COOPERATIVE PROCUREMENT

A. The Procurement Officer shall have the authority to participate in, sponsor, conduct or administer a cooperative purchasing agreement for the procurement of any materials, services, or construction with one or more eligible procurement units in accordance with an agreement entered into between the participants when it is in the best interest of the County.

~~B. Cooperative Procurement Agreements Required.~~

~~1. The County is not authorized to participate in cooperative purchasing unless, prior to the solicitation, an Intergovernmental Procurement agreement is executed between the parties. All agreements entered into shall be signed and approved by the Board.~~

~~2.~~1. Cooperative Purchasing Authorized.

a. The County may participate in, sponsor, conduct or administer a cooperative purchasing agreement for the procurement of any materials, services, or construction with one or more eligible procurement units in accordance with an agreement entered into between the participants. Parties under a cooperative purchasing agreement may:

1. Sponsor, conduct or administer a cooperative agreement for the procurement or disposal of any materials, services, or construction.

2. Cooperatively use materials or services.

3. Commonly use or share warehousing facilities, capital equipment and other facilities.

4. Provide personnel, except that the requesting eligible procurement unit may pay the public procurement unit providing the personnel the direct and indirect cost of providing the personnel, in accordance with the agreement.

5. Upon request, make available to other public procurement units informational, technical or other services that may assist in improving the efficiency or economy of procurement. The public procurement unit furnishing the informational or technical services has the right to request reimbursement for the reasonable and necessary costs of providing such services.

~~3.~~2. General Services Administration (GSA) Purchasing Authorized.

a. The Procurement Officer may authorize purchases under the GSA contracts which specifically allow cooperative purchases by other governmental agencies if it is in the County's best interest to do so.

16. PROCUREMENT OF CAPITAL ASSETS

A. The Counties may record capital assets on the capital assets list as items are received or at fiscal year-end. A separate acquisitions list should be maintained during the year to help support the reconciliation of the previous year's capital assets list to the current year's capital assets list and the reconciliation of capital assets acquisitions to total capital expenditures. Counties may receive federal, state or local grants, contracts or other programs to acquire capital assets. Title to such assets may transfer to the county under the terms of the program agreement. The assets should be capitalized and reported in the county's financial statements until the agreement requires their return. Counties should dispose of assets under such programs in accordance with program requirements.

B. Disposal of capital assets requires the using department to complete a County Property Disposition Request Form, so the asset can be removed from the capital asset list and properly accounted for in the County's financial statements. The Finance Department will determine the appropriate disposal method and any monetary value received from the disposal of capital assets will be returned to the appropriate fund.

17. DISPOSAL OF CAPITAL ASSETS.

Counties may record capital assets on the capital assets list as items are received or at fiscal year-end. A separate acquisitions list should be maintained during the year to help support the reconciliation of the previous year's capital assets list to the current year's capital assets list and the reconciliation of capital assets acquisitions to total capital expenditures. Counties may receive federal, state or local grants, contracts or other

programs to acquire capital assets. Title to such assets may transfer to the county under the terms of the program agreement. The assets should be capitalized and reported in the county's financial statements until the agreement requires their return. Counties should dispose of assets under such programs in accordance with program requirements.

SIGNATURE:

CHAIRMAN, BOARD OF SUPERVISORS **DATE**

ARF-7643 **2. D.**

Work Session

Meeting Date: 10/25/2022
Submitted For: Steve Sanders, Director
Submitted By: Steve Sanders, Director
Department: Public Works Division: Floodplain

Information

Request/Subject

Information and Discussion to update the Board on the status of the Campaign Creek Buyout Program and seek direction on proceeding with the buyout.

Background Information

In June of this year, the BOS approved a Hazard Mitigation Grant Program (HMGP) application to the Federal Emergency Management Agency (FEMA) for the buyout of property along Campaign Creek in Roosevelt, AZ.

The total project cost used in the application was $2,080,865 with a federal match of 75% and a local match of 25%.

Evaluation

The last update the County received on the program from the State was the project is being reviewed and at the state level, they feel the project will be successful. The State expects to know in the spring of 2023 whether or not the project will be funded.

Conclusion

The State of Arizona placed $3,000,000 in the Arizona Department of Forestry and Fire Management Budget to be used for the flooding issues along Campaign Creek as a result of wildfires in the area.

This money can be used for the buyout, to pay the County's local match of the HMGP grant if successful, or for a number of other flood protection measures. These funds do not require a cost share. Funds must be utilized prior to June 30, 2025.

Recommendation

N/A

Suggested Motion

Information/Discussion to obtain guidance from the Board of Supervisors' and County Management on the preferred way to proceed on the Campaign Creek Buyout Project. **(Steve Sanders)**

Attachments

No file(s) attached.
