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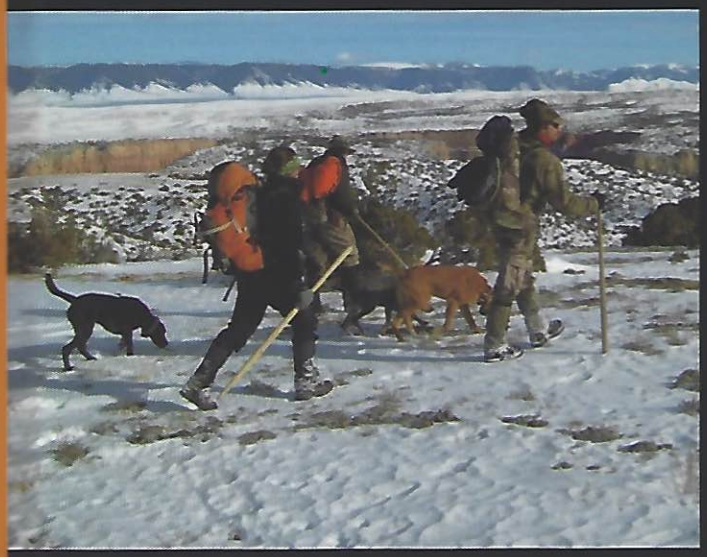

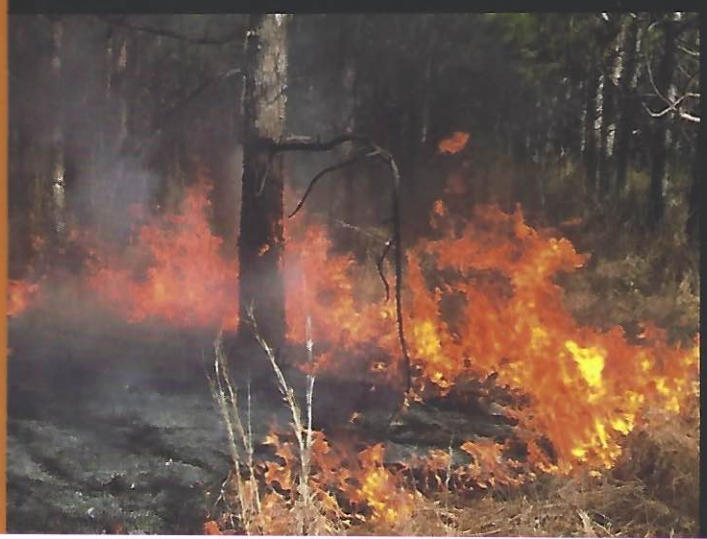

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Environmental Impact Assessment and Habitat Conservation Plans

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INTRODUCTION

IN THIS CHAPTER, we provide an introduction to the process and development of **Environmental Impact Assessments** (EIAs) and **Habitat Conservation Plans** (HCPs). Developing an EIA or HCP requires in-depth knowledge of environmental statutes, including (1) the **National Environmental Policy Act** of 1969 (NEPA; 42 USC § 4321 et seq.); (2) **State Environmental Policy Acts** (SEPAs), where applicable; and (3) the **Federal Endangered Species Act** (ESA) of 1973, as amended in 1982 (ESA; 16 USC § 1531 et seq.) and many other federal and state statutes as well as regulations promulgated pursuant to these statutes. In addition to knowledge of federal, state, and local environmental statutes, regulations, and policies, knowledge of the biotic and abiotic conditions present within the proposed project or impact area is required. During the development of EIAs and HCPs, consultation with federal and state regulatory agencies should occur (USFWS 1996). Consultation with the **US Fish and Wildlife Service** (USFWS) and/or the **National Oceanic and Atmospheric Administration Fisheries Service** (NOAA), state wildlife agencies, local jurisdictions, and recognized experts in fields related to potentially affected project elements will result in a streamlined process and enhance the viability for a plan (USFWS 1996). This chapter focuses on the development of EIAs under NEPA, with an overview of SEPAs and HCPs under the ESA.

STATUTES

To understand EIAs and HCPs, one must consider the statute under which each is developed: NEPA/SEPA and ESA, respectively. Most developed nations have enacted **environmental statutes** requiring an evaluation of potential environmental impacts resulting from projects or policies within their jurisdiction (Truett et al. 1994; Table 49.1). Most environmental statues mandating EIAs were patterned to some extent on NEPA (Eccleston 2008), which will serve as the basis of discussion for this chapter. In the United States, EIAs are required of all federal agencies proposing an action or policy that may adversely affect the environment by NEPA. HCPs are required of proposed actions or policies for federal, state, and private organizations where a proposed action or policy may result in the incidental take of any species listed as endangered, defined as a species in danger of extinction throughout all or a significant portion of its range (16 USC § 1532[6]), or threatened, defined as a species likely to become endangered within the foreseeable future (16 USC § 1532[20])

Table 49.1. Selected nations with environmental impact statutes by region and year enacted.

North America		
United States	National Environmental Policy Act (www.nepa.gov/nepa/regs/nepa/nepaequia.htm)	1969
Mexico	Ley Federal de Protección del Ambiente (www.natlaw.com/pubs/spmxen13.htm)	1982
Canada	Canadian Environmental Assessment Act (www.ceaa.gc.ca/013/index_e.htm)	1992
Central America		
Belize	Environmental Impact Assessment Regulations (www.elaw.org/system/files/bz.eia.regs.2007.pdf)	1995
Europe		
	European Union Directive (2014/52/EU) (http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32014L0052)	2014
Finland	Act on Environmental Impact Procedure (http://www.finlex.fi/en/laki/kaannokset/1994/en19940468.pdf)	1994
Norway	Regulation on Environmental Impact Assessment	2009
Poland	Environmental Protection Law (http://esdac.jrc.ec.europa.eu/Library/Themes/Contamination/workshop_Nov2003/legislation/PolandEnvironmentalProtectionAct.pdf)	2001
Sweden	The Environmental Protection Act	1969
United Kingdom	Town and Country Planning Regulations (http://www.legislation.gov.uk/uksi/2011/1824/contents/made)	2011
Oceania		
New Zealand	Resource Management Act (www.mfe.govt.nz/rma/index.php)	1991
Australia	Environmental Protection and Biodiversity Conservation Act (www.environment.gov.au/epbc/index.html)	1999
Asia		
India	Environmental (Protection) Act (www.envfor.nic.in/legis/env/env1.html)	1986
Nepal	Environmental Protection Act (www.moest.gov.np/en/environment/act1997.php)	1997
Bangladesh	Bangladesh Environmental Conservation Act (www.basel.int/legalmatters/natleg/bangladesh02.pdf)	1995
China	Environmental Impact Assessment Law (www.chinaenvironmentallaw.com)	2002
Georgia	Law on State Environmental Assessment (www.elaw.org/node/1326)	1996
Malaysia	Sarawak, Natural Resources and Environment Ordinance	1997
Sri Lanka	National Environmental Act (www.cea.lk/national _environmental_act.php)	1980
Africa		
Nigeria	Environmental Impact Assessment Decree No. 86 (www.elaw.org/node/1459)	1992
Swaziland	Environmental Audit, Assessment and Review Regulations (www.ecs.co.sz/leg_sd_files/env_leg_sd.htm)	2000
South Africa	National Environmental Management Act (www.sher-q.co.za/New_EnvironmentalManagementAct.html)	2007

under the ESA (ESA § 4). We provide an overview and discussion of both NEPA and relevant sections of the ESA on which the development of EIAs and HCPs are required by law and the types of documents prepared.

National Environmental Policy Act

The National Environmental Policy Act of 1969 was enacted on 1 January 1970 to provide guidance to federal agencies on the evaluation of their actions and subsequent effects on the environment (NEPA § 102 et seq., 42 USC § 4332). Typically, the NEPA decision-making process begins when a federal action is proposed or when a proposed action is federally funded (Eccleston 2008). Upon proposing a federal action, the regulatory agency will conduct an internal scoping to determine if there are (1) **no significant environmental effects**, (2) **significant environmental effects of an uncertain degree**, or

(3) **significant environmental effects** (Eccleston 2008). Once a determination of the potential effect of a proposed action or policy has been identified, a NEPA-compliant document (e.g., Finding of No Significant Impact, Biological/Environmental Assessment, Environmental Impact Statement) can be prepared following adequate studies (Eccleston 2008).

State Environmental Policy Acts

Fifteen states currently have a SEPA, with Oregon currently under legislative review (Table 49.2). All SEPAs are similar to NEPA, with regulatory oversight authority given to a state agency (e.g., **state wildlife agency or state EPAs**) for proposed state actions potentially affecting the environment, with some states exercising additional authority over local projects (Box 49.1). The process of EIA development and review under SEPAs is similar to the NEPA process; those persons working in states with SEPA statutes (Table 49.2) needing guidance to develop environmental documents should consult their state statute to determine specific requirements of study and document development, environmental review, and project permitting.

Federal Endangered Species Act

The ESA is administered by both USFWS and NOAA Fisheries Services, with NOAA Fisheries Services primarily responsible for marine species and USFWS responsible for all other species. The purpose of the ESA is to (1) conserve ecosystems on which endangered and threatened species depend, (2) take appropriate steps to provide programs for the conservation of endangered and threatened species (ESA § 2[b]), and (3) mandate all federal departments seek to conserve endangered and threatened species and use their authorities to further the purpose of the ESA (ESA § 2[c]). Three sections (Sections 9, 7, and 10) of the ESA have specific relevance to requirements and development of HCPs.

Section 9

Section 9 of the ESA provides the basis for which HCPs are founded, specifically the restriction on take of any species listed as threatened or endangered under the ESA. **Take** is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (ESA § 3[18]).

Box 49.1 State Environmental Policy Act, California Environmental Policy Act—Biological Resources

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA) serves as an example of a **State Environmental Policy Act** (SEPA) statute. The CEQA was incorporated into the California Public Resources Code § 21000-21177 in 1970, with the purpose to (1) inform governmental decisions makers about potentially significant environmental effects of proposed activities, (2) identify ways to avoid or significantly reduce environmental damage, (3) require changes in projects through the use of alternatives or mitigation measures when feasible, and (4) disclose to the public reason why a project was approved if significant environmental effects were involved.

All projects proposed in California requiring issuance of a permit by a public agency are subject to CEQA. Sixteen issue areas, including biological resources, are subject to evaluation during the CEQA process. The Biological Resources category has 6 questions that must be addressed during the CEQA process. Would the proposed project: (1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service? (2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulation, or by the California Department of Fish and Game or US Fish and Wildlife Service? (3) Have substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? (4) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of a native wildlife nursery site? (5) Conflict with any local policies or ordnances protection of biological resources, such as tree preservation policy or ordinance? and (6) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? The 6 questions outlined in Appendix G of CEQA have 4 possible categories: (1) Potentially Significant Impact, (2) Less Than Significant with Mitigation Incorporated, (3) Less Than Significant Impact, or (4) No Impact (Association of Environmental Professionals 2009).

Table 49.2. States (US) and Provinces (Canada) with Environmental Policy Acts.

State	Statute
California	California Environmental Quality Act
Connecticut	Connecticut Environmental Policy Act
Georgia	Georgia Environmental Policy Act
Hawaii	Hawaii Environmental Policy Act
Indiana	Indiana Environmental Policy Act
Maryland	Maryland Environmental Policy Act
Massachusetts	Massachusetts Environmental Policy Act
Minnesota	Minnesota Environmental Policy Act
Montana	Montana Environmental Policy Act
New Jersey	Executive Order # 215
New York	State Environmental Quality Review Act
North Carolina	North Carolina Environmental Policy Act
South Dakota	South Dakota Environmental Policy Act
Virginia	Virginia Code sections 10.1-1188 *et seq.*
Washington	State Environmental Policy Act
Wisconsin	Wisconsin Environmental Policy Act

Province	Statute
Alberta	Alberta Environmental Protection and Enhancement Act
British Columbia	Environmental Assessment Act
Manitoba	Environment Act
New Brunswick	Clean Environment Act
Newfoundland & Labrador	Environmental Protection Act
Northwest Territories	MacKenzie Valley Resource Management Act
Nova Scotia	Environment Act
Nunavut	Nunavut Land Claims Agreement Act
Ontario	Environmental Assessment Act
Prince Edward Island	Environmental Protection Act
Quebec	Environment Quality Act
Saskatchewan	Environmental Assessment Act
Yukon Territory	Yukon Environmental & Socio-Economic Assessment Act

Section 7

Section 7 of the ESA requires federal agencies proposing any action or policy potentially affecting a listed species or defined critical habitat to consult with USFWS. Consultation between federal agencies and USFWS is initiated in what is termed "**Informal Consultation**," where USFWS provides the federal agency with information on the potential presence of a listed species or critical habitat for listed species within the action or policy area (50 CFR § 402.02). When USFWS determines that no listed species or critical habitat occurs or may occur within the proposed action or policy area, Informal Consultation is concluded and the policy or action does not require further consultation with USFWS (USFWS 1996). In this case, a letter stating that no listed species or critical habitats will be affected is prepared by USFWS within 90 days from the date on which consultation was initiated (ESA § 7[b]).

However, when USFWS determines that a listed species or critical habitat may be affected as a result of implementation of the proposed action or policy, "**Formal Consultation**" (ESA § 7[a][2]) procedures are initiated. During formal consultation, the federal agency proposing the action or policy is required to submit a **Biological Assessment** (BA) to determine the potential effect of the action or policy on the listed species for submittal to USFWS (ESA § 7[c]). Once a BA has been completed by the federal agency, or designated representative, and submitted, USFWS will review the BA and prepare a **Biological Opinion** (BO) within 180 days after the initiation date (ESA § 7[c]). ESA § 7(2) states that each agency action shall ensure the action is "not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species." When a BO results in a "no-jeopardy" opinion, the action may proceed with specific measures incorporated to mitigate potential impacts. Measures or mitigation may include, but are not limited to construction monitoring, habitat restoration or mitigation, and in lieu fees to USFWS.

Section 10

Section 10 of the ESA is for proposed private projects or actions lacking a **federal nexus** (a federal nexus is a determination of a federal agency involved in permitting actions or authorization of federal funds); it allows for issuance of "**incidental take permits**" for actions prohibited under Section 9 for scientific purposes, or to enhance the propagation or survival of the affected species (ESA § 10[a][1]). Actions resulting in take must be incidental to an otherwise legal activity; one example of an otherwise legal activity is site grading which results in habitat destruction or alteration (ESA § 10[B]). In this example, the grading of the site is a legal activity that may result in take, but not specifically intended to result in take as defined in Section 9.

An incidental take permit may not be issued unless the project applicant submits an HCP (ESA § 10[a][1][B], 50 CFR § 17.3). The HCP must specify what impacts are likely to result in take, steps to minimize and mitigate impacts, funding available to implement minimization and mitigation, and alternative actions considered and the reason for not implementing other alternatives. After a USFWS review of and public comment period on the HCP, USFWS may issue the incidental take permit and authorize the HCP if it is determined that take is incidental, the applicant will maximize minimization and mitigation measures, sufficient funding is available, and take will not reduce the likelihood of the survival or recovery of the species in the wild (ESA § 10[2][B]).

ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessment is the process of identifying and evaluating the consequences of human actions on the environment, and mitigation for those consequences, when necessary (Erickson 1994). EIAs require a project proponent or agency, state or federal, to view the environment as an aggregation of biotic and abiotic conditions present where the project or policy will be implemented (NEPA § 102[2][c]; Hil-

debrand and Cannon 1993). Several types of EIAs are prepared in the United States, including **Environmental Impact Statements** (EIS, 40 CFR § 1502, NEPA § 102[2][c]), **Environmental Assessments** (EA, § 1508.9), **Categorical Exclusions** (40 CFR § 1508.4), and **Findings of No Significant Impacts** (40 CFR § 1504). When the environmental effect is uncertain, the regulatory agency has the option of conducting a public scoping period to receive input from interested parties (e.g., private citizens, conservation organizations, and other public entities). **Public scoping** (if conducted) is required for the preparation of an EA or EIS.

Pursuant to NEPA, federal agencies are responsible for the preparation and certification of EIAs. While project applicants may prepare an EA in support of a proposed project, they may not prepare an EIS due to potential conflicts of interest. In many instances, the responsible federal agency may solicit a third-party preparation of an EIS under their supervision (Yost 2003).

In an ideal situation, project proponents would incorporate specific evaluations at each project phase identifying specific impacts that may result from project implementation (Erickson 1994, Truett et al. 1994). In most situations, however, EIAs are not considered until later in project development phase. Two scenarios that are common when project proponents solicit EIAs include incomplete biological studies or biological studies that have been completed, but need to be incorporated into the EIA.

A survey of 52 federal agencies in 1991 reported the surveyed agencies prepared >1,000 EAs to each EIS prepared (Bass et al. 2001). We limit further discussion to EAs, as EAs are the most prevalent document prepared to evaluate environmental impacts under NEPA.

Document Purpose and Development

EAs are meant to be succinct public documents prepared by a federal agency, project applicant, consultant, or another agency when a proposed action has the potential to have significant environmental effects (40 CFR § 1502.1). EAs also may be prepared by an agency in the planning and decision-making process (40 CFR § 1501.3).

NEPA requirements for preparations of EAs can vary between federal agencies, with each agency having its own EA procedures and guidance processes. Regardless of the agency, **each EA prepared must include** (1) need for the proposed action (40 CFR § 1502.13), (2) description of the proposed action and alternatives (40 CFR § 1502.14 et seq.), (3) anticipated impacts of the proposed action (40 CFR § 1502.15, 40 CFR § 1502.16) and alternatives (40 CFR § 1502.14 et seq.), and (4) agency and expert consultation conducted (40 CFR § 1502.25).

Need for the Proposed Action

Need for the proposed action statement establishes why the project proponent is proposing an action or project that may cause significant environmental affects (40 CFR § 1502.13). A properly framed statement will limit the number of alternatives to the proposed action or project that can be considered reasonable, prudent, and practicable and demonstrates the potential effect of not implementing the proposed action or project (Bass et al. 2001).

Description of the Proposed Action and Alternatives

Prior to preparing EIAs, project proponents should **define proposed actions thoroughly and accurately** (40 CFR § 1502.14 et seq.). At a minimum, proposed actions should include names and types of the project, locations (including regional, local, and site maps), project features, construction schedule and activities, and features or measures taken to reduce potential impacts (Bass et al. 2001).

Descriptions of alternatives considered should include an evaluation and comparison of reasonable proposed alternative actions, including no-action alternatives, and reasons for not implementing each alternative. Descriptions of each alternative should provide sufficient information to allow readers to evaluate relative merits of each alternative and suitable justification as to why the alternative was not preferred (Bass et al. 2001).

Agency and Expert Consultation

Agency and expert consultation is an integral component to developments of EIAs. Agency consultation provides project proponents with necessary guidance to ensure compliance with specific environmental statutes and discuss potential implementation effects (Truet et al. 2005). Expert consultation is beneficial, although not required, during the EIA process. Consulting with recognized experts will, in many cases, provide greater detail on potential project impacts and comprehensive alternative action analysis, particularly mitigation measures that would reduce potentially adverse effects (Truett et al. 1994).

Public Review and Notification

When an internal review of a proposed federal action is determined to have a significant environmental effect, the lead agency must publish a **Notice of Intent** (NOI; 40 CFR § 1508.22) in the Federal Register and conduct public scoping to receive input from interested parties (40 CFR § 1506.6). Once public scoping is completed, the lead agency will prepare an internal **Draft Environmental Impact Statement** (DEIS; typically, qualified outside consultants are contracted to prepare EISs). A DEIS drafting typically take 1–2 years and must be followed by a public comment period (USFWS 1996). A **Notice of Availability** (NOA) will be published in the Federal Register, formally opening the public comment (40 CFR § 1503 et seq.) period (60 days), where the public can review the DEIS and provide comments. Once the public comment period ends, all received comments are addressed during the preparation of the Final EIS (FEIS). The final step in the EIS is adoption (40 CFR § 1506.3) and publishing a Record of Decision (ROD; 40 CFR § 1505.2) in the Federal Register and subsequent implementation of the proposed action (40 CFR § 1505.3).

HABITAT CONSERVATION PLAN

The concept and process of HCPs were modeled after the San Bruno Mountain HCP developed in the mid-1970s in the San Francisco Bay region of California (Beatley 1994). A proposal to excavate San Bruno Mountain over a 20-year period to provide fill for the San Francisco Airport was produced in 1965, resulting in the formation of the San Francisco Bay Conservation and Development Commission, Save the Bay Committee, Committee to Save San Bruno Mountain, and many local citizen groups opposing the proposed project and preventing the proposed development. Subsequent to the 1965 San Bruno Mountain project, a proposal to develop approximately 18,581 m^2 of office and commercial space and 8,500 residential units was begun. The project was initiated to mediate conflicts between development activities and endangered species protection and, when completed, ended with issuance of an incidental take permit in 1983. The HCP was developed through the coordinated efforts of USFWS, the State of California, local municipal governments (including San Mateo County, the City of Brisbane, Daly City, and South San Francisco), private landowners, and nongovernment organizations (e.g., Committee to Save San Bruno Mountain). The approach taken by the creators of the San Bruno Mountain HCP has become the model on which all HCPs are developed (Beatley 1994).

HCPs are variable in size of area and number of species covered, as well as duration of agreement. For example, of 430 approved HCPs, size of area ranges from 0.07 ha to >6,475 km^2, number of listed species is between 1 and 29, number of total species covered is from 1–165, and duration of agreements is from <1–100 years (http://ecos.fws.gov/conserv_plans/).

HCP complexity ranges from the relatively simple (e.g., HCPs for the Alabama beach mouse with typically areas of <0.8 ha and durations of <50 years) to highly complex, with numerous stakeholders, species, and large spatial and temporal extents. One of the more complex HCPs approved to date is the Western Riverside Multiple Species HCP (Riverside County, California), which covers 25 listed and 140 nonlisted species over 5,261 km^2 and 75 years. The Midwest Wind Energy Multiple Species HCP is typical of HCPs, covering 7 species over 8 states for a 45-year period (USFWS 2016*c*; Box 49.2).

Regardless of the number of species, area, or duration of an HCP, all documents must specify the following: (1) impacts likely to result from the proposed taking; (2) measures undertaken to monitor, minimize, and mitigate impacts and funding to undertake such measures; (3) alternative actions considered resulting in no take and justification for not implementing said actions; and (4) additional measures USFWS or NOAA Fisheries Services may require as necessary or appropriate. We will discuss each separately as they relate to the development of HCPs (USFWS 1996).

Purpose

The **purposes of the HCP** process and issuance of incidental take permits are to authorize incidental take of a federally listed threatened or endangered species, not to address the underlying activities resulting in take. Processes of developing HCPs ensure that, to the maximum extent possible, minimization and mitigation for effects authorized in the incidental take permit are addressed (USFWS 1996).

Assessing Take

Before an HCP can be written, coordination with USFWS or NOAA Fisheries Services should be conducted to determine whether or not take is the likely outcome of a proposed action or policy. During the evaluation of the proposed action or policy, consultation with USFWS or NOAA Fisheries Services must be conducted to assess if the proposed action or policy can reasonably **avoid take by one of the following**: (1) relocation of the proposed action or policy area, (2) relocation of project facilities, (3) seasonal changes in timing of initiation of the action or policy (typical for projects affecting breeding birds and amphibians), or (4) similar actions. When take cannot be avoided, USFWS or NOAA Fisheries Services will recommend the project proponent apply for an incidental take permit (USFWS 1996).

Species and Effect Determination

Once a project applicant identifies which species are likely to be adversely affected by the proposed action or policy, the project proponent must develop an HCP. USFWS recommends that all potentially occurring threatened or endangered species that may be affected by the proposed action or policy be addressed in the HCP to **reduce potential violation** of ESA § 7(a)(2). Such violations would result in project delays, work stoppage, and/or fines levied upon the project proponents (USFWS 1996). In addition to species listed under the ESA, it is strongly recommended the project applicant include additional species that may become listed while the incidental take permit is authorized (USFWS 1996). **Species not afforded protection** under the ESA that have been included in development of HCPs include (1) federal candidate species, (2) federally sensitive species (including those on US Forest Service and US Bureau of Land Management [BLM] lists), (3) state endangered or threatened species, and, occasionally, (4) species of local importance. After a species list and effect determinations have been prepared by the project applicant, consultation with USFWS or NOAA Fisheries Services should be conducted to ensure the adequacy and obtain concurrence of the species list and effect determinations (USFWS 1996).

Likely Impacts

An adequate development of an **HCP includes 4 tasks**: (1) delineation of the HCP boundary or plan area, (2) biological data collection and synthesis for species covered by the

Box 49.2 Midwest Wind Energy Multi-Species Habitat Conservation Plan

The **Midwest Wind Energy Multi-Species Habitat Conservation Plan** is a proposed 45-year plan covering Minnesota, Wisconsin, Michigan, Iowa, Missouri, Illinois, Indiana, and Ohio, initiated in 2012 and proposed for adoption in 2017. This multispecies habitat conservation plan (MSHCP) was created to provide a framework to streamline the federal Endangered Species Act compliance process in response to ongoing growth of utility-scale commercial wind energy development in the Midwest and the conservation and economic limitations of planning mitigation/monitoring of federally listed bird and bat species at individual project sites. The MSHCP requested authorization of incidental take of 7 species occurring within the plan area, including Indiana bat, northern long-eared bat, little brown bat, Kirtland's warbler, interior least tern, piping plover, and bald eagle (Figs. 49.1–49.3).

Fig. 49.1. Little brown bat populations have experienced declines and slow recovery rates and are a focal species for the Midwest Wind Energy MSHCP.

Fig. 49.2. Bald eagles were removed from the Federal Endangered Species Act in 2007, but retain federal protection under the Bald and Golden Eagle Protection Act.

The primary objective of this MSHCP was to obtain authorization for take of covered species under the Endangered Species Act (ESA) for covered activities within the plan area, including construction; operation, maintenance, and repairs; decommissioning, reclamation, and repowering; and monitoring. The estimated financial commitment to the MSHCP for the 45-year plan period is $11.7 million and will be available from various sources, including fees on covered activities and nonfee public funding, with the master permittee serving as the Administrative Implementing Entity (USFWS 2016).

Fig. 49.3. Cranes flying near wind turbine generators.

The conservation plan provided in the MSHCP is designed to avoid, minimize, and mitigate the impacts through the development of alternative operations-related

continued

take avoidance strategies and adaptive management programs. The goal of the MSHCP is to support and maintain viable populations of the 7 covered species within the plan area while avoiding or minimizing impacts to these species from wind energy development and operations.

The Habitat Conservation Plan (HCP) established a monitoring and adaptive management program to facilitate meeting the goals outlined for the HCP. The monitoring and adaptive management program established a framework and decision-making process to evaluate monitoring, research, and data management, which allow the project proponent to adapt measures through the term of the plan. Monitoring activities are supposed to provide data that can be incorporated into conceptual models allowing the project proponent to evaluate specific actions and adjust as necessary to meet the objectives of the HCP (USFWS 2016).

HCP, (3) identification of activities proposed that are likely to result in incidental take, and (4) quantification of anticipated levels of take (USFWS 1996).

HCP Delineation

Delineation of the proposed HCP boundary or plan area should include the applicant's project, land-use area, or jurisdictional area for which the proposed action is likely to result in incidental take. Under the ESA, there are no regulations concerning an HCP's required coverage area; as previously discussed, current HCPs may range from <1 ha to nearly 6,500 km^2. A clearly defined boundary is critical to successful application of HCPs and reduces the potential for uncertainty during HCPs' duration (USFWS 1996).

Biological Data Collection and Synthesis

In most cases, a project applicant will require outside assistance, typically from an ecological consultant, to guide the applicant through the HCP process, including literature and database reviews and **research of species covered** by an HCP. At a minimum, these efforts require an understanding of the current distribution, ecology, occurrence data, and applicable regulations for each species covered (Truett et al. 2005). Availability of current and complete data may be limited for some taxonomic groups (e.g., invertebrates and herpetofauna); in such cases, consultants use professional knowledge and judgment to make reasonable inferences based on similar species or scenarios to estimate potential project impacts (USFWS 1996).

Proposed Activities

USFWS recommends project applicants provide a detailed **description of all proposed activities** within the HCP boundary likely to result in incidental take over the HCP's duration (USFWS 1996). Specific project descriptions and likely effects result in an easier evaluation of incidental take. For example, specific details describing grading and excavation activities required for a construction project might include the following verbiage:

> Construction activities will include site grading at 6 locations (Exhibit 1) totaling 4.9 ha. Grading will be conducted outside of the known breeding bird season (20 September to 14 February) with a D-9 bulldozer. Topsoil will be skimmed and stockpiled at 6 preidentified locations (Exhibit 1) during construction activities and reclamation of 4 locations will be accomplished by spreading stockpiled topsoil to a depth of not less than 30.5 cm upon completion of the project (Exhibit 2).

Anticipated Incidental Take Levels

The project applicant must provide a determination of the amount of **incidental take anticipated** as a result of the proposed action. The project applicant must inform USFWS of how incidental take will be calculated, the level of take and related impacts resulting from proposed actions, and the level of incidental take actually authorized (USFWS 1996).

To accurately assess potential incidental take levels, the project applicant should make a **good-faith effort** to determine the number of each species covered by the incidental take permit and HCP. Complete counts may be possible for small projects, whereas regional scale projects may require population modeling or density estimates, when appropriate. There are 2 possible scenarios for providing the level of anticipated incidental take: the first is the actual number of each species anticipated to be killed, harmed, or harassed as a result of the proposed action, and the second scenario is based on the amount of habitat affected either directly or indirectly from a proposed project element when numbers of individuals are unknown or cannot be determined (USFWS 1996).

MITIGATION

Due to the variable nature of HCPs, as well as species and associated habitats that may be affected as a result of project implementation, the USFWS does not provide standard regulatory guidelines for specific **mitigation measures** to be used by a project proponent. Regardless of the proposed mitigation, each proposed measure must be based on a sound bio-

logical basis and should be feasible and proportional to the impacts they are designed to address (USFWS 1996). **Mitigation approaches** commonly employed for HCPs can include any or all of the following: (1) avoidance, (2) minimization of impacts, (3) habitat restoration, and (4) habitat preservation (USFWS 1996).

Avoidance can be accomplished through project designs or timing of proposed activities (e.g., including bridge designs that completely span potential habitat or limiting certain construction activities outside the breeding bird season). When proper coordination occurs between project proponents and USFWS, impact or effect avoidance is possible. Coordinated avoidance efforts typically include relocating proposed elements from suitable habitat for an identified species to areas containing no potential habitat. An avoidance example for projects potentially affecting the Mohave desert tortoise (Fig. 49.4) may include relocating a project impact site within suitable habitat (e.g., Mojave Creosote Bush Scrub; Holland 1986) to areas lacking desert tortoise habitat (e.g., Pinyon-Juniper Woodland; Holland 1986).

When avoidance is not possible either through the design or timing of the proposed action, **minimization measures** must be implemented and approved by USFWS. Minimization measure could include (1) the use of the most degraded habitat, (2) reducing the size of the permanent impact area, (3) reduced construction or maintenance during key biological periods, (4) habitat manipulation, (5) best management practices (BMPs), and (6) access control (e.g., reduced public or livestock access).

Rectification of impacts may include habitat restoration (e.g., removal of invasive exotics, plantings or other vegetation manipulations, creation of new habitat) or habitat preservation (e.g., project proponent purchases land containing suitable or occupied habitat and donates to NGO, agency, etc., for preservation in perpetuity; USFWS 1996).

Fig. 49.4. The desert tortoise is listed under the Endangered Species Act as "threatened." Human development activities have reduced its population in many areas. *Photograph by F. Reder.*

Restoration activities are most frequently conducted in HCPs as a means for offsetting temporary impacts as a result of the proposed activity (ESA § 10[B][ii]). Temporary impacts are those impacts that include staging areas, temporary access roads, and so on. Depending on the size, affected habitat, and duration of temporary impacts, restoration may or may not be viable mitigation. Restoration activities can be as simple as reseeding grassland areas or top soil reclamation or as complex as restoring tidal wetland systems.

Compensation can be accomplished through the purchase of land of comparable habitat, both in size and quality. Most compensation for impacts to habitats suitable to support threatened and endangered species is based on the habitat "value" and requires mitigation ratios. A simple example of habitat "value" is the qualitative scoring system used by the Natural Resources Conservation Service (NRCS) in range assessments. Under the NRCS scoring system, range sites are qualitatively scored from 5 to 1 (excellent to poor) based on species composition, habitat functioning, and site degradation (NRCS 2003).

An example of compensation as a mitigation tool can be found in the West Mojave Plan (BLM 2005). BLM identified areas with specific compensation requirements based on estimated habitat quality for projects potentially affecting desert tortoise and their associated habitats. Mitigation ratios for impacts to suitable habitat range from 0.5:1 (low quality habitat) to 5:1 (exceptional habitat). With clear definitions of mitigation ratios already identified for the area, project proponents can identify the amount of in lieu mitigation or land purchase for habitat preservation that may be required based on the location within the West Mojave Plan area.

Conservation banking is another form of HCP-related habitat impact mitigation approaches. Mitigation or conservation banks are permanently protected lands managed for threatened, endangered, or candidate species that intend to offset adverse impacts resulting from a project implemented elsewhere (USFWS 2009). The Balcones Canyonlands Conservation Plan is an example of mitigation banking (Beatley 1994). Development and other projects near Austin, Texas (particularly areas over Edwards Limestone geology), that could affect several endemic, federally listed species (e.g., black-capped vireos [Fig. 49.5], golden-cheeked warblers, several salamanders, cave invertebrates, and 27 species of concern) are offset through purchase credits within the Balcones Canyonlands Preserve (BCP). Over time, mitigation purchase credits are used to purchase contiguous land containing suitable habitat for a variety of species. This **mitigation banking** effort includes joint management of the BCP by a variety of primary stakeholders, including Lower Colorado River Authority, USFWS, Texas Parks and Wildlife Department, Travis County, City of Austin, private landowners, developers, and several NGOs (USFWS 2005).

Fig. 49.5. Male black-capped vireo. *Photograph by T. McFarland.*

Available Funding

All HCPs, regardless of species, size, or duration, must have **sufficient funding** available to ensure proper implementation of the agreement. The ESA required detailed accounting of available funding to implement mitigation measures proposed under the HCP (ESA § 10[a][2][B][iii]; USFWS 1996).

The implementation agreement (IA) always contains provisional funding language. **Federal funding**, which may be used during the implementation of the HCP, is subject to the requirements of the **Anti-Deficiency Act** and to availability of appropriate funds. Failure to meet requisite funding levels prior to approval of the HCP and incidental take permit are grounds for suspension, revocation, or denial of existing permits (ESA § 10[a][C]; USFWS 1996).

Alternative Actions Considered

Alternative actions are those actions that were considered during the HCP process and are determined to be infeasible during project implementation. Alternative actions considered will always include the preferred alternative, a no-build alternative, and numerous alternative project scenarios. Examples of alternative actions include modification of construction schedules to reduce incidental take during key biological periods (e.g., during breeding or migration periods), relocation of project elements to avoid potential impacts to sensitive habitats or wetlands, or land purchase agreements (USFWS 1996).

Coordination and Planning

The HCP process was created by Congress as a method to reduce issues and conflicts between species with a federal listing and nonfederal development projects (USFWS 1996). The USFWS and NOAA Fisheries Services are active participants in the HCP process, not just regulatory overseers, and **early coordination** is essential for a successful HCP. The HCP must adequately address state listed species as well, and coordination with the state's habitat conservation planning branch is critical. Otherwise, failing to coordinate with the state will result in a delayed HCP. Some states have their own permitting process, and further planning and coordination are required on this level. The crux is to ensure the HCP complies with Sections 7, 9, and 10 of the ESA (USFWS 1996).

Permit Processing

The **final permitting process** varies depending on completeness and complexity of submitted applications and supporting documents (e.g., EIS, EA, or Categorical Exclusion). For proposed actions having minimal or low effects on listed or candidate species and their associated habitats, the target processing time is 3 months. HCPs that do not have a minimal or low effect on listed species and their associated habitats require submittal of either an EA or EIS, with a target processing time of 4 to 12 months. In most cases, the target processing times are the minimum time it will take to process the application, and in most instances, actual permitting will require longer periods of time due to available staff and higher-priority projects. After permit processing, the USFWS will publish a Notice of Availability in the Federal Register opening a 30-day public comment period, with an option to extend the period to 60 days. Interested parties can review the document and provide comments to the USFWS (ESA § 10[3][c]). At the closing of the public comment period, USFWS or a designated representative of the project applicant will compile, address, and evaluate comments prior to issuance of the incidental take permit and HCP implementation (USFWS 1996).

Implementation

Once USFWS approves an HCP and issues the incidental take permit, the HCP may be implemented by the project proponent. **Monitoring** is a key component to the **implementation** of an HCP to ensure the applicant is proceeding with project activities as agreed upon. If monitoring is conducted by an entity other than USFWS, periodic reports would be required by USFWS, documenting progress, as well as compliance and noncompliance, with the issued permit (ESA § 10[b][v]; USFWS 1996).

No Surprises Rule

The **No Surprises Rule** (63 CFR § 8859) provides project applicants for an incidental take permit with long-term certainty that USFWS or NOAA Fisheries Services will not require additional commitments of land or finances beyond the level stipulated for the term of the Incidental Take Permit except under extraordinary circumstances. The No Surprises Rule ensures the government honors agreements outlined within the HCP (43 CFR § 17.22(c)(5), 43 CFR § 17.32(c)(5)).

SAFE HARBOR AGREEMENTS

Safe Harbor Agreements (63 CFR § 32,180) are voluntary agreements in which USFWS works with nonfederal landowners to develop management actions contributing to the recovery of a listed species for a predetermined time period (64 CFR § 32.717). Management actions can include (1) habitat maintenance and (2) reintroduction of threatened or endangered species onto private lands. USFWS provides regulatory assurances to the nonfederal landowner with an enhancement of survival permit (ESA § 10[a][1][A]) in exchange for implementation of management actions. The enhancement of survival permit provides the best mechanism to carry out the permanent Safe Harbor policy, providing the necessary assurances to participating landowners, while also providing conservation benefits to the covered species for the duration of the Safe Harbor Agreement, even if take of a threatened or endangered species is involved (64 CFR § 32.171 et seq.). The enhancement of survival permit may include "no surprises" assurances (43 CFR § 17.22[c][5], 43 CFR § 17.32[c][5]; Box 49.3).

CANDIDATE CONSERVATION AGREEMENTS

Candidate Conservation Agreements (CCAs) are formal agreements between USFWS and nonfederal landowners addressing conservation needs of candidate or at-risk species (50 CFR § 17.22[d], 50 CFR § 17.32[d]). **Candidate species** are those species with enough information on their biological status and threats to their long-term survival to be listed as threatened or endangered under the ESA (ESA § 4[b][3][c][iii]), but are precluded from listing by higher-priority listing activities. Enrolled landowners typically receive regulatory assurances from USFWS, providing incentives to voluntarily implement conservation measures for candidate or at-risk species. Similar to Safe Harbor Agreements, an enhancement or survival

Box 49.3 Gulf Coast Prairies of Texas Safe Harbor Agreement

The Safe Harbor was developed as a provision of the Habitat Conservation Plan for the Gulf Coast of Texas and adopted to promote restoration, conservation, and/or enhancement of prairie habitats supporting endangered species, specifically the Attwater's prairie-chicken (Fig. 49.6), Houston toad, and Texas prairie dawn flower, on private lands and protect individuals entering into this voluntary agreement from future liabilities under the Endangered Species Act (US Fish and Wildlife Service [USFWS] 1995). There are 2 key differences between a Safe Harbor and a Habitat Conservation Plan (HCP): (1) Safe Harbor is voluntary and (2) Safe Harbor is proactive.

Fig. 49.6. Attwater's prairie-chicken is listed as endangered by the US Fish and Wildlife Service due to habitat loss.

The Safe Harbor encourages private landowners to restore and/or enhance degraded habitat and conserve existing habitat to promote the recovery of the 3 listed species. Once a private landowner has agreed to enter the Safe Harbor, USFWS will establish baseline habitat improvements (e.g., brush clearing, prescribed burning, and native vegetation reestablishment) or responsibilities. Earmarked funds for habitat improvements and responsibilities were made available for enrolled landowners to encourage participation and offset costs associated with voluntary conservation measures. Landowners may continue to conduct any lawful action at the enrolled property so long as they do not go below the baseline established in conjunction with USFWS (USFWS 1995).

At present, a total of 12 landowners have entered into the Gulf Coast Prairies of Texas Safe Harbor with total land enrolled at >89 km^2. Should participating landowners decide to opt out of the Safe Harbor Agreement, they are required to notify USFWS and allow USFWS to relocate any endangered species from the property. Landowners also may sell land enrolled in the Safe Harbor, with the buyer given the option to continue or decline further participation (USFWS 1995).

permit (ESA § 10[a][1][A]) will be issued by USFWS, providing that no additional conservation measures will be required if the species becomes listed in the future, even if take is involved (64 CFR § 32726–32736). This permit also allows permit holders to take wildlife species and modify habitat conditions to those agreed upon and specified in the CCA (64 CFR § 32726–32736).

SUMMARY

The environmental movement of the 1960s and early 1970s established key environmental statutes (e.g., NEPA and ESA) on which EIAs and HCPs are based. Under NEPA, federal agencies are required to assess potential affects a proposed project or action may have on the environment. Several types of EIAs are prepared in the United States, including EIS (40 CFR § 1502, NEPA § 102[2][c]), EA (40 CFR § 1508.9), Categorical Exclusions (40 CFR § 1508.4), and Findings of No Significant Impacts (40 CFR § 1504). The most commonly prepared EIA in the NEPA is the EA.

Preparation time of individual EIAs is related to the complexity of the proposed project or action and the number of potential environmental affects resulting for each component of the proposed project or action. SEPA documents closely parallel the format, structure, and development time of NEPA documents.

Section 10 of ESA, as amended in 1982, allowed for the issuance of incidental take permits for private projects, potentially resulting in take, as defined in Section 9 of the ESA, through otherwise lawful activities. In order for USFWS or NOAA Fisheries Services to issue an incidental take under Section 10, project proponents must prepare an HCP for review. HCPs must include (1) a purpose statement, (2) assessment of potential take, (3) listed and nonlisted species considered for coverage, (4) likely impacts, (5) delineation of the HCP boundary and time the HCP will be in effect, (6) mitigation of take, (7) available funding, (8) alternative actions considered, and (9) coordination and planning.

USFWS offers voluntary alternatives to HCPs for individuals, including Safe Harbor Agreements (63 CFR § 32,180) and Candidate Conservation Agreements (50 CFR § 17.22[d], 50 CFR § 17.32[d]). Safe Harbor Agreements allow private landowners to enter agreements with USFWS to conduct voluntary conservation measures assisting in the conservation and recovery of listed species on private lands. Private landowners participating in Safe Harbor Agreements allow individuals to continue lawful activities on their land as long as the baseline habitat remains intact. Candidate Conservation Agreements are proactive agreements with USFWS to enhance existing habitat for candidate species to reduce the likelihood of a candidate species receiving a higher listing under the ESA (e.g., federally listed as threatened or endangered).

Both EIAs and HCPs are environmental documents designed to evaluate and remediate the potential effect of a proposed policy or action to the environment or listed species, respectively. The development of EIAs and HCPs has similar processes where a project proponent discloses the potential effects of the proposed project or action on the environment and how those potential impacts will be avoided, reduced, or mitigated to below the level of significance.