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The Role of Habitat Conservation Plans in Facilitating Transportation Infrastructure: A  
Preliminary Investigation and Proposal for Further Research

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**THE ROLE OF HABITAT CONSERVATION PLANS IN  
FACILITATING TRANSPORTATION INFRASTRUCTURE**

**A Preliminary Investigation and Proposal for Further Research**

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**by**

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## **Abstract**

Habitat Conservation Plans (HCPs) are federally approved mechanisms for allowing incidental harm of endangered species resulting from otherwise lawful activities, such as highway construction, in exchange for agreed upon conservation or mitigation measures. Large transportation projects may be delayed or terminated if they impinge upon endangered species. HCPs represent one method by which non-federal entities may proceed with infrastructure or development projects even if endangered species are present. This paper explores the historical background of HCPs, and investigates their potential for expediting infrastructure project delivery. Our analysis of literature regarding HCPs, as well as an overview of current HCPs that contain both infrastructure projects and off-site mitigation, provides a framework for further, more detailed, empirical exploration of whether and under what circumstances HCPs reduce time and costs for environmental review of large infrastructure projects.

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## **Habitat Conservation Plans**

Over the past 40 years, the federal government has adopted an extensive legal framework for protecting endangered and threatened species, including criminalizing the harm or killing of endangered plants or animals. In some circumstances, otherwise lawful activities, such as construction of transportation infrastructure, result in the accidental harm or killing of federally listed endangered species. To allow needed and sensible development projects to go forward, Congress authorized the establishment of Incidental Take Permits, also known as Section 10 Permits, which allow incidental harm of endangered species in exchange for appropriate mitigation and conservation measures. Habitat Conservation Plans (HCPs) serve as the basis for a non-federal entity to receive a Section 10 permit. There are currently 670 HCPs that have been approved by the U.S. Fish and Wildlife Service across the country. Each is unique in both its acreage and the scope of species impacted and activities permitted.

Although the U.S. Fish and Wildlife Service approves most HCPs to facilitate residential and commercial development, a few dozen HCPs authorize transportation infrastructure activities, including maintenance, operations, and construction. Some planning practitioners believe the presence of an HCP may offer time and cost benefits for the environmental review of large infrastructure projects. To date, there has not been a comprehensive review of whether HCPs may afford such benefits. An undertaking of this magnitude requires resources beyond those available for the current study. We embarked on an initial, exploratory research project to better understand the relationship between HCPs and transportation infrastructure, particularly the institutional background.

Our report is divided into three main sections. First, we investigate the historical development of HCPs. This includes a detailed description of the restrictions that federal and non-federal land developers face under endangered species laws, and the procedures they must go through to gain approvals to develop or use land when endangered or threatened species are present, such as the development of a Habitat Conservation Plan. Second, we review current literature regarding HCPs. Lastly, we inventory and describe HCPs across the country to determine which HCPs include transportation infrastructure or significant land development, involve public agencies, and cover sufficiently large areas to be relevant to our research question.

## **History of Establishing HCPs through ESA amendment**

The U.S. Endangered Species Act (ESA), enacted in 1973 during a period of heightened environmental awareness and action, aims to conserve threatened and endangered plants and animals and the habitats in which they are found. The ESA identifies two types of species that need regulatory protections: endangered and threatened. Endangered species are those nearing extinction, while threatened species are likely to become endangered. The Secretary of the Interior may designate a species as threatened or endangered following a public petition or a biological assessment. The process for designating a species as threatened or endangered involves extensive analysis by the U.S. Fish and Wildlife Agency, as well as public comment.

Section 9 of the ESA prohibits any action – by a federal or non-federal entity – that causes a "taking" of any listed species of endangered fish or wildlife. The statute defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Likewise, import, export, and interstate and foreign commerce of listed species are all generally prohibited.

Although the Section 9 prohibition limits the number of infrastructure and development projects that can proceed, there are currently two ways that the ESA allows projects that might affect listed species to move forward: Section 7 consultations and Section 10 (or HCP) permits. Section 7 consultations allow federal agencies to proceed with activities that result in incidental take, whereas Section 10 permits allow non-federal entities to proceed.

Both methods rely on the idea of “incidental take,” and it is important to understand the concept before detailing the Section 7 and Section 10 methods. Incidental take means that the harming of endangered species is not the planned or primary purpose of lawful land development activities. If such activities are undertaken, there is necessarily, or likely to be, some degree of take or harm to the species and its habitat. The take or harm is, thus, *incidental* to the primary purposes of land development, whether for home construction, road widening, installation of wind turbines, clearing of hiking trails, etc.

## **Section 7 Consultations**

The ESA specifically requires federal agencies to make sure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of designated critical habitat<sup>1</sup> of such species. If a federal agency proposes engaging in or funding an activity that may result in the “take” of one or more listed species, it must consult with the U.S. Fish and Wildlife Service (FWS) and/or the National Oceanic and Atmospheric Administration Fisheries Service to either figure out a way to proceed or determine that no action may be taken.

A Section 7 consultation is a process conducted by the FWS to assess whether a proposed action will reduce the survival or recovery chances of an endangered or threatened species. Permission for an incidental take *may* result if the FWS determines that terms, conditions or appropriate mitigation measures which would reduce the impact to the species are established and agreed to by the consultee. The consultation is required for actions that federal agencies propose to undertake, authorize, permit or fund that will harm endangered species. For example, the U.S. Department of Transportation must enter into a Section 7 consultation with the FWS if a federally funded road project passes through land containing endangered habitat. And the FWS must conduct a Section 7 self-consultation with itself when it decides to issue a Section 10 permit (see information on Section 10 beginning on page 6).

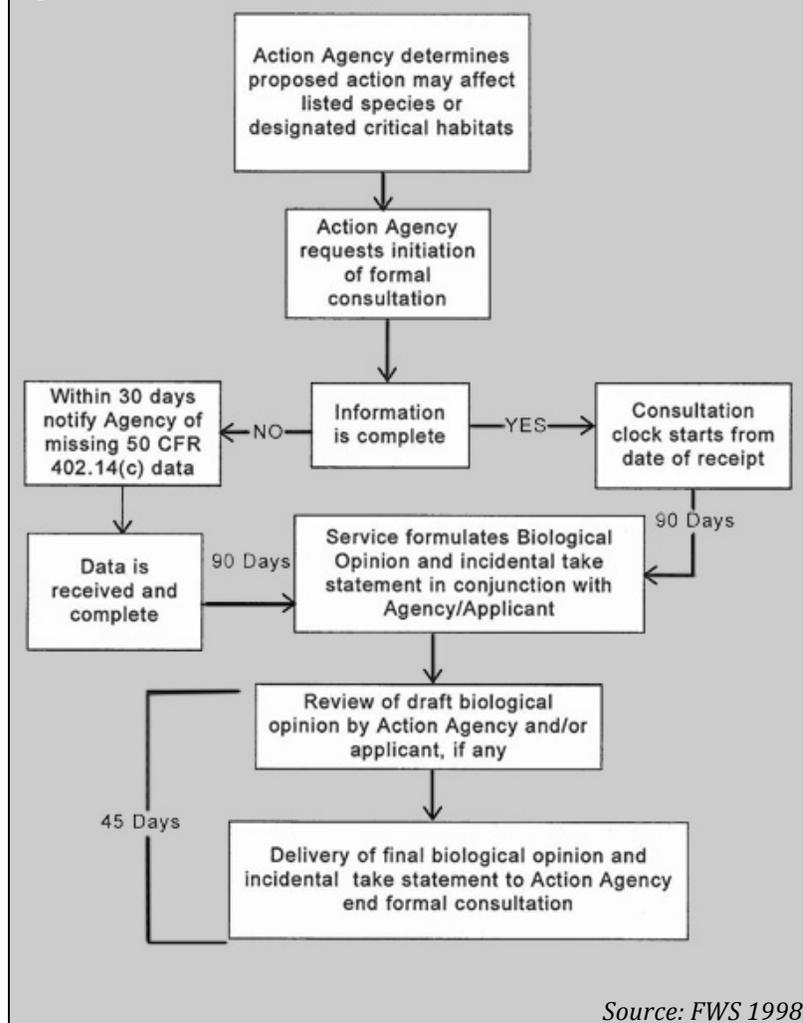
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<sup>1</sup> “Critical habitat” includes geographic areas that contain the physical or biological features that are essential to the conservation of the species and may need special management or protection. Critical habitat may include areas that are not occupied by the species at the time of listing, but are essential to its conservation (FWS 2009).

Under general ESA requirements, the federal agency proposing an activity must first determine whether any threatened or endangered species might be present in the area of the proposed activity. If the agency finds that such species might exist, it must prepare a biological assessment to determine their quantity and distribution, and whether the proposed activity is likely to affect those species. If the biological assessment concludes that the proposed activity will affect the species, the agency must initiate a formal Section 7 consultation with the FWS.

The consultation process begins with the agency providing the FWS with information about the nature of the proposed activity and its anticipated effects on the species. The FWS analyzes the likely accumulated effects on the species from past, current and proposed human activities and issues a "biological opinion." The biological opinion's main thrust is to answer the question: Will the proposed activity "reduce appreciably the likelihood of both the survival and [the] recovery of a listed species in the wild"?

**Figure 1. Section 7 Formal Consultation Process Flowchart**



There are three types of biological opinion outcomes:

1. No Jeopardy Opinion: The project may go ahead as proposed.
2. Naked Jeopardy Opinion: The project will jeopardize species and there are no alternatives; thus, the project may not go ahead.
3. Jeopardy Opinion with Reasonable and Prudent Alternatives (RPAs): The project as presented will jeopardize the species in question, but alternatives (outlined within the biological opinion) that minimize impact and prevent jeopardy can go ahead.

### **Important Terms for ESA Section 7**

<b>Jeopardy</b>	The result of an action that is reasonably expected, directly or indirectly, to diminish a species' numbers, reproduction or distribution so that the likelihood of its survival and recovery in the wild is appreciably reduced.
<b>Recovery</b>	Improvement in the status of listed species to the point at which listing is no longer appropriate under the ESA's criteria.
<b>Survival</b>	The condition in which a listed species continues to exist into the future while retaining the potential for recovery. This condition is characterized by a sufficient population, represented by all necessary age classes, genetic heterogeneity and a sufficient number of sexually mature individuals producing viable offspring. It exists in an environment providing all requirements for reproduction, sustenance and shelter.

*Sources: FWS 1998, FWS 2011b*

The FWS defines RPAs as alternative actions that are consistent with the intended purpose of the action, consistent with the scope of the federal agency's legal authority and jurisdiction, economically and technologically feasible, and that the FWS believes would avoid the likelihood of jeopardizing the continued existence of listed species through excessive take or habitat modification/destruction.

If the FWS issues either a No Jeopardy Opinion or a Jeopardy Opinion with RPAs, it may include an incidental take authorization statement. The statement contains terms and conditions designed to reduce the impact of the anticipated take to the species involved. The authorization of incidental take is contingent upon the federal agency carrying out these terms and conditions.

There is variation in the time it takes for a federal agency that is proposing to carry out, fund or permit an activity to assess the biological conditions and species present, depending on the agency involved and the complexity of the habitat. However, Section 7 specifies that the formal consultation, once initiated, must be completed within 90 days. It also allows the FWS an additional 45 days to prepare its biological opinion.

A significant majority of federal actions that are required to go through a formal Section 7 consultation result in a No Jeopardy Opinion, meaning the project can proceed without modification. Of those that find jeopardy, a large majority are able to identify RPAs that allow the proposed activity to go ahead. Some scholars and analysts believe there is too much politics or "negotiating" in the consultation process, to the detriment of the ideal – and Congressional intent – that biological opinions are to be made only on the basis of biological and scientific considerations (Gosnell 2001).

### **The Section 10, or HCP, Process**

The second method of ESA compliance for projects that may result in the take of endangered species is to obtain a Section 10 permit through the Habitat Conservation Plan (HCP) process.

Non-federal entities, such as states, counties, or private landowners, are ineligible to

undergo Section 7 consultations.<sup>2</sup> Prior to 1982, no provision existed for the incidental take of endangered species by non-federal entities. This meant that non-federal landowners could not, because of Section 9, make economic use of land if it harbored any listed species. In 1982, Congress gave these landowners a way to comply with Section 9 but still proceed with development by amending the ESA to include Section 10(a). The new Section 10 allows the FWS to issue permits for the incidental take of listed species and applies to the activities of *non*-federal landowners, developers and/or their funders or permitting authorities.

To be considered for a Section 10 permit, applicants must prepare and submit a habitat conservation plan. The HCP must discuss the project’s effect on the threatened or endangered species, based on a biological assessment of the listed species in the project area, and specify the impacts likely to result to each species and/or habitat type. In addition to identifying the expected impact on the species, the HCP must outline the steps the applicant will take to minimize and mitigate the impacts, identify the funding that will be available to implement such steps, and detail alternative actions to the taking the applicant has considered and the reason the applicant is not adopting them.” Examples of mitigation and funding strategies for HCPs are listed in Table 1, below. HCPs by default address listed species, but applicants may choose to also incorporate non-listed species in their plans, including those that are likely to become endangered.

The ESA *requires* the FWS approve the HCP and issue the Section 10 incidental take permit once it determines that:

1. The applicant’s take of species will be “incidental to, and not the purpose of, carrying out an otherwise lawful activity,”
2. The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild, and
3. The applicant has the intent and funding to carry out mitigation of impacts and any other measures the FWS may require as being necessary or appropriate.

**Table 1. Examples of HCP mitigation and funding strategies**

Mitigation	Funding
<ul style="list-style-type: none"> <li>• Conservation easement</li> <li>• Direct land purchases</li> <li>• Conservation banks</li> <li>• Transferable development rights</li> <li>• Land donations</li> <li>• Best practices</li> <li>• Educational Campaigns</li> <li>• Habitat restoration</li> <li>• Fee payment</li> </ul>	<ul style="list-style-type: none"> <li>• Development impact/in-lieu fees</li> <li>• Bond sales</li> <li>• Tax increments</li> <li>• Grants</li> <li>• Endowment/Trust funds</li> <li>• Forest (or other resource) harvest fees</li> <li>• Landfill tipping fees</li> </ul>

Due to the explicit directive that the FWS may require additional elements of an HCP as necessary or appropriate, there is usually some negotiating between the FWS and the applicant regarding what the applicant is expected to incorporate into its HCP and implement as part of its mitigation activities. According to the FWS’s HCP Handbook, these “other measures” usually comprise an Implementing Agreement (a legally binding agreement between the USFWS and the applicant) or those that would ensure adequate and sustained funding for mitigation of species and habitat impacts. However, according to at least one observer (Moser 2000), this language gives the FWS too much discretion to

<sup>2</sup> Unless they can find some way to involve a federal agency (e.g., through funding), known as identifying a “federal nexus” In which case the project would go through a Section 7 consultation proceeding.

demand commitments it “desires as a matter of policy but which it is not legally entitled to require” under Section 10. For example, while Section 10 stipulates that an HCP must not appreciably reduce the likelihood of species to survive or recover in the wild (i.e., actions to *avoid* extinction), the FWS has required some HCP permittees to affirmatively contribute to species recovery (i.e., actions to *bolster* the species population).

The Section 10 amendment was prompted by a proposed development project on San Bruno Mountain, near San Francisco. Several species of endemic butterfly, including one species that had been listed as endangered, lived on land targeted for housing development by the Visitacion Company on San Bruno Mountain. As a private developer, Visitacion at the time lacked legal mechanisms providing for the incidental take of endangered species. Their petitioning, with the support of conservationist groups and wildlife enthusiasts concerned about destruction of butterflies and their habitat resulted in Congressional action to amend the ESA. Following legislation authorizing HCPs and the Section 10 amendments, the San Bruno Mountain HCP became, in 1983, the first to receive a Section 10 incidental take permit.

In 1996, the ESA was amended to include Section 10 (a)(1)(B) – known as the “No Surprises” policy. At the time, the Department of the Interior (which houses the FWS) was revising the criteria and timetables by which it would decide how a species went from “proposed for listing” to “listed.” If, under the potentially changed listing criteria, a species were to become listed after an applicant received HCP approval, they would have faced the prospect of needing to redo the HCP and reapply for the Section 10 permit so as to accommodate the newly listed species. The shifting rules and timetables, thus, decreased the degree of certainty around land development activities and therefore discouraged landowners from pursuing the HCP process. In some cases, this uncertainty gave landowners who were considering developing on their land the perverse incentive to preemptively develop or degrade their land before biological consultants had determined whether or not there were any species that could become listed.

The “No Surprises” policy was an attempt to inject some predictability into the HCP process and stability into the benefits promised by HCPs. No Surprises essentially assures non-federal landowners that if “unforeseen circumstances” arise, including the listing of additional endangered species, the FWS will not require the commitment of additional land, water, or financial compensation, or place additional restrictions on the use of land, water, or other natural resources, beyond the level otherwise agreed to in the HCP without the consent of the permitholder. In short, an HCP permit holder would not be punished if additional endangered species become listed within the area covered by the HCP. To gain No Surprises assurances, the applicant must collaborate with the FWS while preparing the HCP to identify “foreseeable changed circumstances” – such as fires or floods in areas prone to such events – and what measures the applicant and/or the FWS will take in response to those events to benefit the species covered by the HCP.

Whereas the FWS approved just 15 HCPs between 1982 and 1994, since 1994 (when No Surprises assurances began) more than 600 HCPS have been approved, pointing to the importance of No Surprises assurances to HCP applicants.

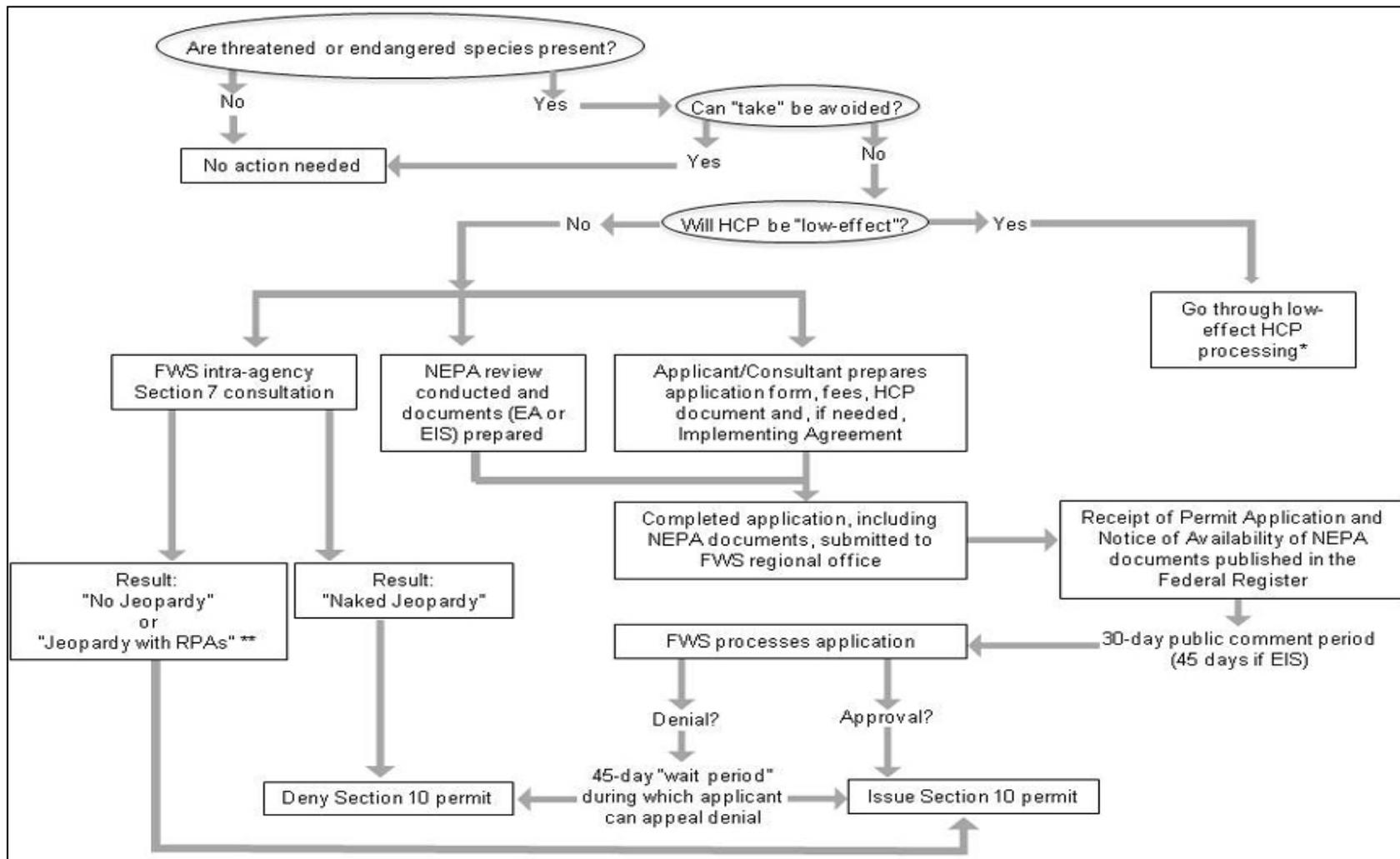
An HCP process can take significantly more time than a Section 7 consultation. Because the FWS effectively becomes a federal agency that is authorizing activity that would affect species, the requirement for the FWS to do both a NEPA review (see page 11) and the Section 7 consultation is triggered. This does mean the FWS must review its own activities,

but in some cases the HCP applicant volunteers to conduct, or hire third parties to carry out, the biological assessment tasks, alternatives formulation or environmental document drafting work.

The planning for and laying out of the actual habitat conservation plan can take from less than a year to several years, depending on the scale and complexity of the spatial area in question, the number of animal and plant species addressed, and the number of stakeholder parties involved. Some applicants involve the FWS in their HCP drafting process, others do it themselves and engage the FWS only once their HCP is ready for submittal.

The diagram on the next page illustrates the steps for a Section 10 permit application.

**Figure 2. Section 10 Permit Application and Processing Steps**



\* The FWS has developed a streamlined processing procedure for "low-effect HCPs," which usually involve a small parcel of land or limited acres of habitat. We do not elaborate on the process for low-effect HCPs here, since our research focuses on more complex HCPs involving large tracts of land and habitat

## HCPs, NEPA and Infrastructure Development

The same wave of environmental activism that ushered in the ESA's passage in 1973 also contributed to the adoption of the National Environmental Policy Act (NEPA) in 1970. Based on notions of environmental stewardship, NEPA establishes a national environmental policy and outlines a systematic approach to ensuring that environmental effects are formally considered as part of the federal government's decision-making process.

NEPA requires a statement, known as the Environmental Impact Statement (EIS), for every major federal action, including transportation infrastructure projects, that significantly affects the quality of the human environment. The EIS must include (i) the environmental impact of the proposed action; (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented; (iii) alternatives to the proposed action; (iv) the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. Although each federal agency has separate NEPA requirements, the box on the right lists some of the environmental impacts commonly addressed in EIS documents for transportation projects.

In addition to NEPA, transportation infrastructure projects are subject to a number of other laws, including the ESA, intended to protect air quality, minimize noise pollution, and monitor and preserve land and water usage. For example, to prevent and monitor water pollution, the Clean Water Act requires a permit from the U.S. Army Corps of Engineers for dredge or fill activities on U.S. waterways. Similarly, the Clean Air Act requires that transportation projects conform to federal air quality attainment standards. In addition to federal requirements, infrastructure projects must also be consistent with state environmental laws, which vary by state.

Together, these environmental requirements for large infrastructure projects can add significant time and expense to infrastructure project delivery. By some anecdotal estimates, preparing appropriate environmental documentation and dealing with litigation can add as much as 10 to 15 years to an infrastructure project. In a recent hearing before the U.S. House of Representatives Transportation and Infrastructure Committee, for example, Thomas Margro, CEO of Transportation Corridor Agencies, in Orange County, California, testified that the federal environmental review process added 15 years to development of State Road 241 in California (U.S. House of Representatives Committee on Transportation and Infrastructure, Hearing on February 15, 2011). However, the exact length of delay due to environmental review is not well understood. Moreover, a 2000 Federal Highway Administration study found that projects for which an environmental impact statement had been in preparation 5 years or longer are held up by a lack of funding, lack of political support, controversy, or complexity.

Officials in Riverside County, California recognized the delay for transportation infrastructure

### **Environmental Impacts Commonly Addressed in an EIS for Infrastructure Projects**

- Air quality
- Water quality
- Noise and vibration
- Wetlands
- Floodplains and coastal zones
- Endangered species
- Natural resource use, including energy
- Changes in natural landscape and built environment
- Public health and safety
- Historical landmarks

projects associated with environmental requirements. Faced with rapidly increasing population and growing demand for transportation infrastructure, Riverside County developed an HCP in conjunction with new general and transportation plans. The Riverside HCP, approved in 2004, included planned transportation projects in the County as activities covered by the plan.

Under Riverside's multi-species HCP, transportation projects, such as road construction or expansion, are subject to unique endangered species review requirements that include species surveys and evaluation for compliance with the MSHCP's siting, design, construction, and wildlife movement guidelines. Transportation projects outside critical areas are not subject to the same environmental requirements. With an Incidental Take Permit approved by the FWS, Riverside County can substitute its HCP for the endangered species component of federal and state environmental laws, rather than complete endangered species surveys on a per-project basis. Officials believe that the multi-species HCP has accelerated project delivery within Riverside County, but no empirical evidence exists documenting whether HCPs shorten the time and lower the costs for large transportation infrastructure projects in jurisdictions outside of the county.

## **Research Question**

The motivation for this project was to begin to evaluate the potential benefits of HCPs for infrastructure capital projects, and then suggest a methodology for investigating the presence and strength of these benefits. Assuming the HCP does not result in further harm to endangered or threatened species, does the HCP mechanism facilitate non-federal jurisdictions' ability to move infrastructure projects forward more efficiently than without HCPs?

The first step in addressing the research question was to conduct a search of the literature; our review of the literature follows in the next section. After that, we assessed the universe of HCPs that currently exists in the United States, and organized them into categories to inform research method avenues that would be less daunting than analyzing all 600+ HCPs. This is represented in the section inventorying the HCPs, following our discussion of the literature, as well as in a catalog of selected HCPs in the Appendix. All of this leads into the final chapter of this report, in which we suggest a framework for methodologies to continue HCP assessment and analysis work that will be needed to provide empirical answers to our research question.

## **Literature on Biological Effectiveness of HCPs**

The FWS commissioned an independent report from Management Systems International (MSI), completed in 2009, evaluating its HCP program. The report contains a chapter dealing with the effectiveness of the program in meeting biological goals and objectives, using 12 case study HCPs. MSI reviewed the planning documents of the HCPs and made site visits; additionally it utilized survey data, interviews with permit holders, FWS staff and other interested parties, and reviews or visits of additional non-case study HCPs. MSI also noted the difficulty of assessing biological impacts for all HCPs because of the overwhelming number and scope of HCPs and significant differences between HCP documents.

MSI found that, in general, HCPs are indeed an effective mechanism for "avoiding, minimizing and mitigating take" of listed species and in some cases are contributing to species recovery. The following are observations the MSI report presented that are most pertinent to our first research question:

- It is difficult to determine specifically whether each HCP is fully meeting its biological goals and objectives as these are not always explicitly stated, targets are not always set and many of the HCPs are relatively new. Some HCPs, however, are specifically designed to *increase* the populations of listed species.
- It is also difficult to determine the quantity and quality of land being affected by development in relation to land being conserved. However, when habitat is lost to development, it is usually being replaced at a ratio of at least 2:1, higher in some cases to compensate for concerns about habitat quality.
- The HCP program has increased the visibility and importance of ecological issues among land use planners, helping to create significant new reserves that otherwise would not have been created.
- Significant amounts of scientific data are being generated through HCP monitoring programs about the biology of at-risk species and the habitats on which they depend. All this information, if analyzed and synthesized in a standardized and collaborative manner, can be used to understand species ecology better and to develop and adjust species recovery strategies.

There is some literature addressing the biological effectiveness of specific HCPs or similar conservation plans on specific species in a specific range, but no others evaluating the overall biological effectiveness of the HCP program.

## **Literature on the Effect of HCPs on Infrastructure Project Facilitation**

The use of an HCP to satisfy the endangered species segment of the environmental review process suggests that HCPs may facilitate infrastructure project delivery by reducing time and cost. Although little research has been conducted to quantify these time and cost benefits for infrastructure projects in HCPs, two studies suggest benefits do indeed exist.

In a survey of individuals familiar with the permitting process in Riverside County, Dixon et al. (2008) found that Riverside's multi-species HCP generally was perceived to have accelerated delivery of infrastructure projects that affected federally listed endangered species. Respondents suggested that the multispecies HCP addresses identification and survey requirements for endangered species and satisfies NEPA mitigation requirements, thereby reducing the time needed to complete the endangered species portion of the permitting process. Respondents also indicated that the multispecies HCP provides organizational benefits, such as clear and certain mitigation measures and interagency coordination, which decrease project delivery time. Another advantage of the multispecies HCP identified by respondents is its ability to reduce litigation intended to halt project delivery, traditionally a time consuming and costly element of project review. The reduction in litigation likely results from the collaborative effort that contributed to HCP formation and implementation, as well identified mitigation measures, the lack of which previously motivated lawsuits.

Additionally, a study of the Balcones Canyonlands Conservation Plan suggests that there are economic benefits such as decreased monetary costs and time savings for compliance with environmental regulations from using an HCP as the mechanism of compliance with endangered species requirements. Gau and Jarrett (1992) compared costs for endangered species compliance for four projects in Travis County, Texas. Using estimated compliance costs for private development projects that would affect endangered species, they calculated that a Section 7 consultation or individual Section 10 permit would cost approximately \$9,000 per acre

(1992 dollars). This is significantly higher than an estimated \$600 per acre mitigation fee for projects that conformed to area-wide HCP requirements. The HCP, therefore, appears to be a more cost-effective method for private developers to comply with endangered species requirements. Importantly, Gau and Jarrett believed that expenses associated with delayed permitting would go down as developers became more familiar with the HCP process, so they did not include it in their calculation. The authors also estimated that compliance cost for a public sector project, the RM 620 highway improvement, would be 2.45 percent of total project expenditures, which is slightly higher than the 2 percent fee assessed under the HCP. Because of the varying nature of public sector projects, however, they hesitated to conclude that compliance costs for public projects under the Balcones Canyonlands HCP would be significantly different than without it.

## **Related Literature**

Hundreds of research articles have been published in the United States about habitat conservation planning since the implementation of the ESA's Section 10 incidental take permit mechanism. In the course of searching for scholarly literature addressing our second research question, several main themes among related literature came to light.

Some scholars have focused on describing and evaluating the processes that go into conceptualizing, organizing stakeholders around, planning for and implementing individual HCPs. McKinney & Murphy (1996) found that in planning for the Balcones Canyonlands preserve, it was important for planners to recognize that issues around resource use are sociological in nature – i.e., how to ration scarce water when there are both urban users and agricultural users clamoring for their maximum share – even though they may manifest as conflicts over biological or engineering questions. The task is, therefore, to resolve such issues through processes that emphasize interaction, trust-building and risk management between biologists and engineers – the two groups that have the most direct stake in an HCP planning outcome.

Greer (2004) explores lessons learned from implementation of the San Diego County Multiple Species Conservation Program (MSCP). In this particular case, Greer identifies key successes, including: strong political support and leadership that ensured the planning and implementation of the MSCP remained on course over a prolonged period; cooperation between the local, state and federal governments that facilitated large amounts of land conservation; flexibility for local jurisdictions that allowed different “subareas” to tailor their own implementation plans to meet their specific needs; computer-based modeling and plan review from independent scientists that increased the scientific objectivity of the HCP; and the integration of the MSCP's preserve boundaries into the City of San Diego's General Plan Open Space elements and into regional land use and transportation plans. Among the challenges – or lessons learned – Greer identifies are: using strong scientific analysis to mitigate inevitable policy changes in and legal challenges to the HCP's regulations; actively pursuing secure, long-term funding; utilizing unambiguous language that ensures all involved parties understand resources which fall under other conservation and permitting regimes (e.g. wetlands and vernal pools vis-à-vis the Clean Water Act and U.S. Army Corp of Engineers' jurisdiction); clearly identifying compliance methodologies, the procedures for their review and modification; and working toward a single repository for monitoring data that allows easy analysis and public dissemination.

Peterson et al. (2004) focus on the inherent tension in habitat conservation planning between liberty (i.e., private property rights) and equality (i.e., public stewardship of species habitats), calling it the “democratic paradox.” The authors point out that where the democratic paradox

operates, no single optimum solution exists for HCPs. After reviewing the planning histories of separate HCPs for the Houston toad and Florida key deer, the authors suggest a process that allows participants to define problems, define conditions for changing plans, engage in vigorous debate, and come to a positive, rather than ideal, outcome – all the while with full acknowledgement of the schism between liberty and equality.

Another thread of the literature looks at the issue of politics-driven versus biology-driven methods for establishing the acreage targets of preserve lands and/or mitigation strategies under HCPs. Harding et. al. (2001) found that a majority of plan preparers did not neglect any scientific information deemed “starkly necessary” in the biological assessment phase, but acknowledged that information was missing or inadequate for some species. Pressey (2004) argues that incomplete species data or nascent technologies for measuring ecological processes should not be justification to delay taking action on conservation planning, which is acknowledged as an inherently subjective undertaking. Svancara et al. (2005) reviewed a set of articles proposing conservation targets in different areas and found that, on average, those conservation areas that were the result of a policy-driven approach that set conservation objectives as a politically favorable percentage of a region, before the requirements of particular species and vegetation types had been identified, were nearly a third smaller in size than those that were the subject of proposals based on biological conservation information. Relatedly, Margules and Pressey (2000) argue that conservation goals will suffer significantly if lands are selected for preservation simply by virtue of being unsuitable or too remote for urban development or commercial activities, and that instead there should be a systematic approach to land selection that also favors the habitat and range needs of covered species.

There has also been quite some interest among researchers in the effectiveness – from both preservation goals and economic standpoints – of various habitat conservation incentive programs for private landowners. Focusing on conservation easements and, in particular, a set of easement contracts and transactions in the state of Florida, Boyd et al. (1999) find that such conservation policies' interactions with property markets, land management practices and bureaucratic incentives can complicate their success. Wilcove and Lee (2004) studied three incentive-based programs for restoring endangered species on private lands and found that technical guidance was more important than either regulatory relief or financial assistance in securing the cooperation of some landowners. Stern (2006) applied theories about influencing human behavior through psychological and economic incentives (rewards and punishments) to the question of habitat conservation. She concluded that landowners have intrinsic motivations to preserve natural resources and recommended more marketing and education to reach a larger pool of potential landowner participants, as well as a restructuring of the incentive programs to safeguard and reinforce intrinsic motivations. Fernandez (2007) analyzed the financial incentives for landowners, conservation bank managers and land developers under habitat regulations for land use and found that the regulations appear capable of attaining conservation goals and providing and/or encouraging a market for mitigation lands that adequately compensates for the removal of land from the development market.

Several other themes and issues taken up in the literature are worth mentioning briefly:

- Pre-existing development restrictions can affect the cost of assembling habitat for protection. For example, Lovell and Sunding (2001) developed a conceptual framework as well as an econometric model of the value of undeveloped land to show, using vernal pool habitat in California's Sacramento County as a case study, how pre-existing development restrictions affect the cost of protecting habitat. In this case the restriction was a program of voluntary differential assessments, and the results showed that

ignoring the presence of the program results in a large overestimate of the cost of habitat protection. This is due to at least two factors: (i) some land is already encumbered by development restrictions, a fact that lowers the cost to the landowner of further restrictions; and (ii) if the government temporarily or permanently prohibits the conversion of agricultural land for environmental conservation reasons, then the possibility of reduced property tax liability for those landholders lowers the cost of the restriction.

- Several factors influence the creation or success of ballot measures that seek to establish or raise public funding for habitat conservation. Kline (2006) found that increases in population density, income and level of educational attainment correlated positively with increased support for open space referenda and possibly an increase in the marginal value people place on open space as it becomes more and more scarce. Kotchen and Powers (2006), using national data as well as focused case observations from New Jersey and Massachusetts, investigated how funding mechanisms and funding rates affected voter support for public acquisition of open space. Voters tended to favor bond measures over taxes, but results regarding the funding rate (i.e. bond amount or tax rate) were more mixed, with responses dependent upon a mix of factors such as type of jurisdiction, size of the jurisdiction and other variables.
- The region-wide economic benefits or costs of managing certain natural resources with or without HCPs in place can vary significantly. As an example, Gillig et al. (2004) explored the economic and environmental implications of proposed groundwater management and water development strategies in the Edwards Aquifer region of Texas, including under a proposed regional HCP. Their results show that enhancing habitat by augmenting water flow would cost \$109–1,427 per acre-foot, depending on the program or strategy. An HCP option, with the strictest limit on aquifer pumping, induces water scarcity for urban users and thus leads, ironically, to increased development of regional water facilities for such users. They also found that a water market, as proposed in a piece of state legislation, would improve regional welfare and lower water development, but worsen environmental attributes.
- Expertise, data and tools can help transportation and environmental practitioners achieve their goals and meet requirements. Howie, Majerus and Schafflein (2007) describe the proceedings and outcomes from a series of workshops – co-sponsored by federal agencies and national NGOs – that brought together transportation and environmental practitioners to discuss ways to link conservation and transportation planning. While expertise, data and tools generally were readily available, they argued that better coordination is needed for accessing and updating information, as well as more promotion of interdisciplinary and collaborative methods for planning that integrates transportation and conservation concerns. Thorne, Girvetz and McCoy (2009) presented a GIS-based database framework used to assess aggregate terrestrial habitat impacts from multiple highway construction projects in California. The data architecture they present allows easy incorporation of new data and useful query reports in a tool that biologists and planners can use without needing to be experts in GIS.
- The costs of managing preserves and refuges, including but not limited to those that are part of an HCP, can vary widely. In 2004, the Center for Natural Lands Management published a report on the long-term conservation management strategies and costs of 28 preserves around the country. They found that not only was there great variation in the types of number of management measures each preserve utilized, but that per-acre costs also varied widely – from \$6 to more than \$2,100. They noted that there were

economies of scale in terms of management costs, but suggested performing individual cost analyses for each preserve to determine the factors driving the costs in each case.

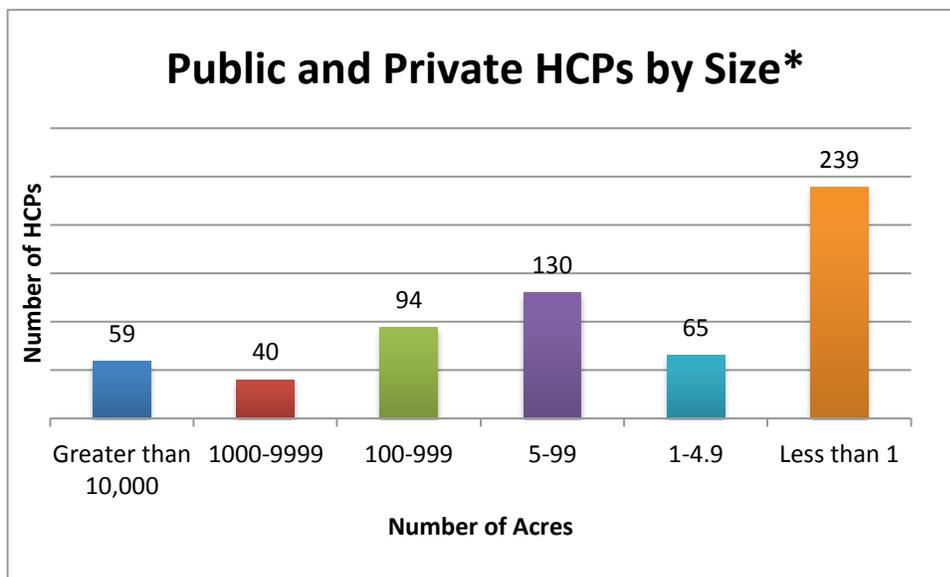
- The methods for assessing the biological effectiveness of individual HCPs should be tailored to the type of HCP at hand and continually evaluated for improvement. There are numerous studies on the biological and ecological effectiveness of HCPs and similar conservation methods relating to specific species or types of landcover. For a more regional conservation assessment, Barrows et al. (2005) started with the premise that single-species monitoring and management strategies are inadequate and inappropriate for multiple-species conservation plans. They suggest a hybrid approach that employs iterative field data collection to uncover links between species occurrences and environmental parameters over multiple scales (e.g., vegetation or soil types over a few acres, or rainfall pattern over several square miles). Using a specified computer modeling program, the researchers produce “niche models” for targeted species that explain the temporal and spatial niche each species occupies over a study area. Multiple niche models representing multiple species can then be analyzed side-by-side to inform the appropriate monitoring and management plan for the given HCP. Using the Coachella Valley MSHCP as a test case, the authors suggested their approach can help managers determine how, when and where to employ adaptive management strategies and, ultimately, help make the management of regional conservation plans involving many species and habitat types less daunting.

In sum, there is not a large amount or variety of scholarly research that has been published that directly address our specific research question about whether HCPs are, in general, effective at stabilizing or improving the biological condition of at-risk species, or advantageous from the point of view of facilitating infrastructure capital projects. Thus, further research that builds upon earlier findings and this preliminary investigation would be a meaningful contribution to the field.

## An Inventory of HCPs

HCPs come in a variety of shapes and sizes. As of April 2011, the FWS had issued 670 incidental take permits for HCPs (FWS 2011a). Some HCPs are entered into by individual, private landowning entities that are issued and have sole usage rights of their Section 10 permits. These HCPs are typically small (less than five acres) and cover a single species or specific activity. Approximately half the 670 HCPs consist of less than five acres and fall within this category. Private companies or utilities with business interests that are limited by the presence of endangered species also develop HCPs. Still others involve coalitions of several local jurisdictions and span wide areas. This last group is the focus of our analysis.

The relatively few large-area HCPs represent a significant majority of acres governed by HCPs. These area-wide HCPs may cover multiple species and activities, and may be governed by an implementing body that has the power to delegate its authority to landowners or developers that meet HCP requirements. The following chart illustrates the breakdown of all 670 HCPs by size.



\* The FWS did not have size data for 43 HCPs. They are not included in this chart, but are all individual lots so it can be assumed they are less than five acres.

### Land Swap/Infrastructure-Focused HCPs

In order to answer our research question, we narrowed the universe of HCPs to those which were most relevant. Small, individual HCPs, which generally permit residential or commercial development, were excluded. By definition, these HCPs do not mitigate the effects of large infrastructure projects. We also excluded HCPs developed by private companies or utilities because they are unlikely to develop large public infrastructure projects.

We assumed that public HCPs over 1,000 acres that included infrastructure projects as activities permitted by the plan were most relevant to our research question. Further, public infrastructure projects typically fall under the jurisdictions of public agencies and those agencies may be motivated to act to expedite environmental review. We also hypothesized that the time and cost benefits afforded by HCPs result from a comprehensive off-site mitigation strategy

developed as part of the HCP, as opposed to a project-by-project approach to mitigation without the HCP. For example, an HCP may include specific transportation projects as approved activities under the plan. Rather than mitigate for each project, the HCP outlines the mitigation measures that must occur to adequately address endangered species. Off-site mitigation refers to land that is used for mitigation and that is separate from the area in which the project or development takes place – typically, a preserve or land bank on which uses are highly regulated and development is limited or disallowed. The primary purpose of this land is generally conservation or preservation of endangered habitat.

A small number of public HCPs use off-site mitigation as a mechanism for facilitating infrastructure development. We identified 99 HCPs consisting of more than 1,000 acres, of which 49 involve public entities as the sole permittee or one of the permittees, and the remainder of which involve private companies. These HCPs generally span multiple local, regional, and even state jurisdictions. Although not mandatory, these HCPs may cover multiple endangered or threatened species and permit a variety of activities. Half of the public HCPs over 1,000 acres are located in California and Nevada; the rest are distributed throughout the country.

We investigated each of the 49 public HCPs over 1,000 acres to determine whether infrastructure construction is a permitted activity under the plan and the approved mitigation measures for incidental take. We found 14 HCPs with a specific focus on infrastructure projects and off-site mitigation. These are similar to the Western Riverside County MSHCP in that transportation infrastructure is a component of the plan, although the extent to which transportation is a central element varies. It is important to note that in all HCPs, including Western Riverside's, transportation infrastructure is one of many elements in the plan. These HCPs often seek approval for a wide range of activities, so as to coordinate different activities that all require environmental compliance. Twenty-one HCPs include off-site mitigation, but not a specific infrastructure component. These are typically HCPs intended for residential and commercial development. Although all HCPs within this category contain off-site mitigation, the extent to which it is used as a mitigation tool varies. Some use off-site mitigation as a primary mitigation tool, whereas some are more programmatic in nature and use off-site mitigation as one of many mitigation and conservation strategies. Thirteen public HCPs over 1,000 acres are not relevant to our research question. These are HCPs in which the take permit is not extendable to second- or third-party applicants, or covered activities are or relate to withdrawal or harvesting of a rechargeable/renewable resource, or occur on water. The 49 public HCPs are individually described in detail in the Appendix.

## **Suggested Methods for Continued Research**

In this section we propose a method for a more in-depth research project that would seek to answer our research question (see page 12).

Addressing our research question – whether HCPs facilitate the delivery of infrastructure capital projects undertaken by non-federal agencies or developers – will likely require a heavily case-based research approach rather than a quantitative comparison. This is largely because there is so much variation between individual HCPs, and also between state and local environmental regulations. For example, it would be meaningless to compare the time and cost delays with or without an HCP for a project to install a septic sewage system on a five-acre ranchette with a project to construct a system of canals, dams and reservoirs. Even if the comparison was made between HCPs for two identical types of infrastructure project, the comparison would still be

rendered at least problematic if one is located in a state with stringent environmental regulations – such as California which has its own version of NEPA – and the other is located in a state with a less stringent environmental regulations – such as Nevada, which has no state-level NEPA-like environmental impact reporting requirement.

Additionally, the circumstances surrounding each infrastructure project – even within a single state – are extremely complex. Comparing an infrastructure project completed within an area governed by an HCP to a project outside an HCP oversimplifies the conditions leading to project delivery and makes it difficult to attribute any benefits specifically to the HCP. Infrastructure projects do not lend themselves to simple comparisons. Any number of other factors, such as friendlier political environments, better funding availability, and more comprehensive planning, may facilitate infrastructure project delivery but are not included by simply comparing time and cost for projects with and without HCPs. Moreover, it is extremely difficult to quantify delay. No systematic records documenting delay for individual projects exist, and would likely require extensive analysis of public documents. It would be almost impossible to calculate delay specifically due to mitigation and litigation over endangered species. Calculating the cost of delay is similarly difficult.

Therefore, we suggest a case study approach to a subgroup of 6 to 12 HCPs that exhibit similar qualities from the list of large, public HCPs we identified. These would likely draw from the 14 HCPs that include both infrastructure projects and off-site mitigation measures (see Appendix). A case study approach allows in-depth understanding of related HCPs and potential insights into their benefits. In addition to more detailed analysis of documents establishing the HCP and monitoring its implementation, we recommend interviewing representatives from public agencies familiar with both the HCP and infrastructure project implementation that are best suited to recognize and explain any benefits from HCPs. These individuals typically have a vast amount of institutional knowledge that enables them to describe whether project delay existed and how – or if – the HCP facilitated project delivery. For each HCP, we also recommend a more detailed analysis of the plan itself as well as subsequent reports in order to better understand the intended goals of the HCP whether the plan is meeting its objectives.

## **Conclusion**

Since the ESA prohibits any action that causes harm to endangered species or destruction of their habitat, prior to the authorization of HCPs in 1982, non-federal entities were limited in their ability to proceed with otherwise lawful activities, including transportation infrastructure projects, which might incidentally harm endangered species. As federally approved mechanisms for allowing incidental take of threatened and endangered species in exchange for agreed upon mitigation and conservation measures, HCPs provide a way to move forward on development and infrastructure projects without fear of criminal or civil endangered species violations. Use of HCPs to facilitate development was somewhat limited until the adoption of the “No Surprises Policy,” which limits HCP permit holders’ liability for mitigating the take or harm of species that become threatened or endangered subsequent to HCP approval. The number of approved HCPs has grown exponentially since the No Surprises policy was adopted.

In light of the expanding use of HCPs to address endangered species compliance, we developed a question to guide our research: do HCPs facilitate large infrastructure projects for non-federal entities in a more expedient manner than without HCPs? To help inform our understanding of this question, we reviewed literature on HCPs. Although we found limited

scholarship directly addressing our research question, a couple of studies indicate that HCPs may be an effective tool for biological conservation while providing time and cost benefits for large infrastructure projects.

In addition to reviewing literature, we also inventoried current approved HCPs to determine how many are relevant to our research question. While almost half of current HCPs are smaller than five acres and are unrelated, approximately 7 percent of current HCPs are over 1,000 acres and involve non-federal public government jurisdiction. We divided these HCPs into three categories: (1) those with infrastructure as a primary or prominent approved activity and off-site mitigation; (2) those with off-site mitigation but no, or minor, infrastructure activities; and (3) those unrelated to our research question. We believe the HCPs in the first category are most pertinent to our research question. Lastly, we suggested quantitative and qualitative approaches to addressing the two research question we proposed, and identified up to 14 HCPs that could serve as ideal case studies for a future analysis.

With the limited amount of research that has been published dealing directly and precisely with our research question, research that continues the inquiry we have begun would comprise an important contribution to the fields of conservation and land use and infrastructure planning. The background information we provided and the methodological framework we suggested clears a path forward for just such an endeavor.

## APPENDIX

### *Catalog of HCPs Involving Public Permittees with Plan Areas of 1,000 Acres or More*

We divided the HCPs into three categories. We first listed the HCPs with off-site mitigation and a specific focus on infrastructure projects. The second category includes HCPs with off-site mitigation but without an infrastructure component. The third category is HCPs not relevant to our research question.

The HCPs are grouped, to the extent possible, by geography.

#### **HCPs with off-site mitigation and a specific focus on infrastructure projects:**

- **Western Riverside County Multiple Species HCP (CA)**

The Western Riverside County Multiple-Species Habitat Conservation Plan (MSHCP) is a regional plan that involves several jurisdictions authorized to extend its Section 10 permit rights to different types and sizes of landowners within the study area. Planning for the Western Riverside County MSHCP was motivated by a rapid increase in population growth and development in the County in the last three decades, and the plan was approved in 2004. It aims to protect 146 species (25 of which are endangered) within a 500,000-acre reserve system of core habitat – making it one of the largest and most ambitious MSHCPs to have been approved. The HCP was entered into by Riverside County, 16 cities, several county-level public agencies, and California's Department of Transportation (Caltrans). Because of the size and scope of the MSHCP, the planning entities, including transportation agencies, concurrently updated the County's transportation and general plans to provide a comprehensive and unified approach to growth within in the County. One of their intentions was to create an institutional structure through which necessary and planned infrastructure projects could proceed without being bogged down in environmental review.<sup>3</sup>

About 77 percent of the core habitat reserve was already public or quasi-public when the plan was approved in 2004. Responsibility for assembling parcels for, managing and reporting on the reserve rests with the Regional Conservation Authority (RCA) of Riverside County, of which the County and the 16 cities are members. The assembly of the remaining acreage will occur through direct acquisition on the part of local, state and federal governments, as well as dedications and funding from mitigation activities and fees associated with development.

- **Coachella Valley Multi-Species HCP (CA)**

Coachella Valley has been one of fastest-growing areas of Riverside County. The Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP) provides a regional vision for growth that also meets the requirements of federal and state endangered species laws. Approved in 2008, the CVMSHCP aims to conserve over 240,000 acres of open space and protect 27 plant and animal species. The CVMSHCP ensures the continuation of the fringe-toed lizard permit (see Coachella Valley Fringe-toed Lizard HCP, below) and provides long-term conservation for this endangered species. It also expedites construction of all currently planned road projects in the Coachella Valley for the next 25 years, as well as construction and widening of regional roads and freeways and freeway interchanges. The plan's lead agency is the Coachella

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<sup>3</sup> Interview with Tom Mullen and Laurie Dobson Correa of the Riverside Conservation Authority on April 7, 2011.

Valley Association of Governments (CVAG). Permittees include Riverside County, eight cities within the valley, a water district, and an irrigation district.

- **Orange County Southern Subregion HCP (CA)**

Roughly two-thirds of the permanent habitat reserve that has been set aside as part of this HCP are lands within the privately owned Rancho Mission Viejo (RMV), one of three permittees for this HCP. The elder generations of the RMV landowning families decided to enter into habitat conservation planning with the County in order both to clarify development privileges for younger generations of the family and contribute to the County's efforts to address preservation of coastal sage scrub habitats and their associated species of wildlife.<sup>4</sup> As part of the agreement, RMV will have set aside approximately 20,000 acres – or roughly 75 percent – of its remaining undeveloped land, while being allowed to develop housing, commercial and industrial land uses, and supporting infrastructure (the Ranch Plan) on the other 25 percent. The second permittee under this HCP is the County of Orange, which owns the remaining third of the total permanent habitat reserve in the form of existing regional and wilderness parks, and will be permitted to make improvements to habitats and roads within the reserve areas, as well as operate and expand a landfill facility. The third permittee is the Santa Margarita Water District, which under the permit will be allowed to construct and maintain infrastructure and facilities relating to water storage and conveyance. The only off-site mitigation allowed under the HCP is for County-owned lands and activities, including mitigating within the permanent habitat reserve for landfill facility activities and an opt-in in-lieu fee generated by development on remaining residential lots in one portion of the plan area.

- **Shell Oil Company/ Metropolitan Water District of Southern California HCP (CA)**

This plan, approved in 1996 and resulting in a 50-year incidental take permit, deals with just two species of small bird – one listed and the other threatened. The proposed project area is in northern Orange County. Shell Oil's proposed project comprised the remediation of a depleting oil field and subsequent conversion of 875 acres into a residential/commercial development, including an elementary school, a public golf course and public parklands. Additionally, the project called for the construction of an arterial road required to serve the community. Shell Oil agreed to set aside and permanently preserve certain habitat areas, as well as fund management and monitoring biological staff positions with the California Department of Parks and Recreation (CDPR). It also agreed to transfer to CDPR, through a below-market value sale, ownership of a 979-acre parcel of land adjacent to Chino Hills State Park for habitat protection and passive recreational purposes. Shell Oil also agreed to reserve an additional 228-acre mitigation bank for potential future public acquisition. The Metropolitan Water District of Southern California (MWD) sought HCP coverage for ongoing maintenance and facility modifications a water treatment plant adjacent to the Shell oil field. Under the HCP, MWD agreed to co-fund one of the CDCR biologist positions, preserve walnut woodland habitat in a conservation easement, mitigate the spread of non-native vegetation, and purchase additional acreage for dedication to the Chino Hills State Park.

- **Fieldstone/La Costa & City of Carlsbad HCP (CA)**

This HCP was motivated in large part by a master plan by Fieldstone/La Costa, a

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<sup>4</sup> Phone interview with Laura Coley Eisenberg, VP of Open Space and Resource Management at Rancho Mission Viejo, on May 18, 2011.

developer, for ranchette-style residential development on lands with significant habitat value. Approved in 1995 and valid for 30 years, it covers 54 species – 10 of them listed – on a plan area of 1,955 acres. Mitigation measures are both onsite and off-site, with start-up and short-term funding provided by the developer. The City of Carlsbad was a permittee because of its plans to re-align two roads as part of the urban development.

- **Kern County Waste Facilities HCP (CA)**

The Kern County Waste Management Department (KCWMD) is responsible for 14 sanitary landfills in Kern County outside the Metropolitan Bakersfield Habitat Conservation Plan area (see MBHCP, above). The HCP covers all 14 landfills, a planned pit-and-drainage facility, and two planned transfer station facilities – all of which combine for a total of 2,063 acres under the permit. The landfill operation activities covered under the HCP include routine waste acceptance and management, facility maintenance, transfer station operation, and eventual facility closure. The landfill sites that still contain undisturbed habitat will preserve those habitats or mitigate for them off-site. Off-site mitigation measures include the acquisition and management of a significant buffer area around one of the sites as well as the purchase of credits from specified mitigation banks. The permit was issued in 1997 and is valid for 50 years.

- **Eastern Contra Costa County HCP/NCCP (CA)**

By the mid-1990s, by forming a task force to study the area's biodiversity, local governments and citizens in Eastern Contra Costa County (East County) recognized that the region's rapid urban development would impact endangered and special status species, and make the development permitting process more and more time-consuming and costly. In 1998, the U.S. FWS and California's Department of Fish & Game sent a letter to local government agencies urging that a regional HCP be developed for Eastern Contra Costa County, and in fact, during the planning process it became clear that the East County's water deliveries would be conditioned on the successful creation of the HCP. Covering an inventory area of roughly 175,000 acres, the East County HCP was approved in 2007, allowing the incidental take of 26 species (eight of them listed) for 30 years. It will set aside between 23,800 and 30,300 acres in a preserve system, to be assembled by the plan operator using land dedications or easements, or fee revenue to purchase off-site mitigation acreage. The plan will streamline approvals for the future growth of the cities of Clayton, Pittsburg, Brentwood and Oakley, and unincorporated communities in the County such as Bay Point and Byron. Up to 11,853 acres of new urban development projects can obtain their endangered species permits under the HCP. A variety of public infrastructure projects would also be facilitated by the plan. Specific rural transportation projects that the HCP permits include the Buchanan Bypass, widening of Byron Highway and Vasco Road widening.

- **Natomas Basin/Metro Air Park HCP (CA)**

The purpose of the Natomas Basin HCP (NBHCP) is to promote biological conservation in conjunction with economic and urban development within certain levee-protected areas of the Natomas Basin, a low-lying area covering portions of Sacramento and Sutter counties north and east of the confluence of the Sacramento and American Rivers, that has historically been used for agricultural purposes, especially the cultivation of rice. The NBHCP establishes a multi-species conservation program to minimize and mitigate the expected loss of habitat values and incidental take of species – listed and special status – that could result from urban development, operation and maintenance of irrigation and drainage systems, and certain activities associated with the management of the system of reserves established under the NBHCP. The permit, approved in 2003

and valid for 50 years, has been issued to three public entities (City of Sacramento, County of Sutter and Calif. Reclamation District No. 1000), a private non-profit water company, and the non-profit Natomas Basin Conservancy (which is also the plan operator). An additional permittee, which obtained some of its original incidental take permits based on conservation strategies in a 1997 approved HCP (encompassing some of the same area but issued only to the City of Sacramento), is the Metro Air Park urban development adjacent to Sacramento International Airport, which is located within the Basin. Land developers are required to provide land and/or fees to establish one-half acre of reserve land for each acre of development (a 0.5:1 ratio), as well as provide funding for enhancement and management of, as well as monitoring on, the habitat reserves. Although the plan anticipates that the mitigation lands will be conserved or managed as either wetland/rice fields with maintained habitat values, marshland or upland, it does not stipulate that any minimum or maximum acres be located within or without the Basin area.

- **Benton County HCP (OR)**

Benton County established a 19,000 HCP in January 2011 that covers five endangered species. It was established to facilitate routine County activities including road maintenance and construction, as well as reduce the burden for individual landowners of mitigating endangered habitat. The area on which incidental take can occur includes approximately 12,000 acres of prairie habitat owned and/or managed by non-federal public agencies and conservation organizations and about 7000 privately owned acres of endangered Fender Blue Butterfly habitat. Specific activities covered by the HCP include home, farm, and forest construction; issuance of building, land-use, and septic system permits; and utility installation, maintenance, and repair on County property. The plan also covers transportation maintenance on county, state, and federal roads as well as specific road construction projects outlined in the County's transportation system plan as well as the HCP. To accommodate incidental take by these activities, the plan contains a series of conservation and mitigation measures such as acquisition of existing endangered habitat from willing sellers, designation of Prairie Conservation Areas for species maintenance and enhancement, and public education campaigns. A variety of funding sources are being considered to fund the HCP, including County funds, general bonds, and local property taxes. Benton County is currently in the process of acquiring 50 acres of prime habitat to be used as the primary mitigation cite for public activities, although future transportation projects may require additional mitigation<sup>5</sup>.

- **Clark County Multiple Species HCP (NV)**

Clark County is home to the City of Las Vegas, which has seen a rate of growth in the past few decades that some have described as "explosive," especially considering its setting in a desert landscape with very limited water resources. The Clark County MSHCP, approved in 2001 and valid for 30 years, is a direct outgrowth of the 1995 Desert Tortoise Desert Conservation Plan, which this MSHCP supersedes. The incidental take of the tortoise plus one other listed species, as well as habitat mitigation for 77 non-listed species, is planned under this MSHCP in conjunction with the urban development of up to 145,000 acres of non-federal lands in the county (out of a study area of 5 million acres). The mitigation measures include collection of a \$550-per-acre development fee and implementation of an endowment fund for the purchase, monitoring and management of conservation lands primarily on existing public lands, but

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<sup>5</sup>Phone Interview with Jeff Powers, Director of Benton County Natural Areas and Parks Director and HCP Coordinator on May 6, 2011

with some purchases or acceptance of fee title or easements, grazing allotments, water rights. Translocation of tortoises is also a significant mitigation measure under this MSHCP. There were several planned transportation improvements involving lands in Clark and other counties at the time of MSHCP approval, including road, high-speed rail and airport facility projects. Transportation facilities occur on both non-federal and federal lands, with most major highways crossing federal lands and involving federal highway funds (and, therefore, requiring Section 7 consultation rather than an HCP permit for ESA compliance). Some transportation projects were already getting coverage under a Clark County Long-term Desert Tortoise HCP, which this MSHCP superseded. Other than closing off some areas with higher habitat sensitivity to state roadway development, the MSHCP is not anticipated to alter the environmental review requirements for state road development. Nonetheless, the Nevada Department of Transportation has agreed to 35 mitigation measures as a one of the MSHCP's permittees.

- **Southeastern Lincoln County HCP (NV)**

This HCP, approved in 2010 and valid for 30 years, covers just two species: the desert tortoise and the southwestern willow flycatcher. The plan's coverage area comprises roughly 1.7 million acres of both federal and non-federal lands, with incidental take (to be) allowed on approximately 31,000 acres. The permittees are/would be Lincoln County, City of Caliente and Union Pacific (UPRR). The (proposed) covered activities include planned land development/conversion and maintenance, utility and infrastructure development and maintenance, flood control activities within the City of Caliente, Lincoln County roadway construction and maintenance, and UPRR activities. The primary mitigation mechanism is a set of per-acre fees on development, which differ depending on whether the proposed development will be on flycatcher and/or tortoise habitat (and in the case of tortoise habitat, where exactly that habitat is located within the planning area). The funds will be used for study, monitoring and translocation of desert tortoises, as well as off-site creation and enhancement mitigation of flycatcher habitat at ratios of either 1:1 or 2:1, depending on the type of habitat that will be removed or damaged.

- **Balcones Canyonlands Conservation Plan (BCCP) (TX)**

The BCCP was among the first regional multi-species HCP incidental take permit ever issued by the FWS (in May 1996 and valid for 30 years). The plan covers 35 species in Travis County and the City of Austin, eight of which are endangered. Several development and public improvement projects were delayed because of endangered species listings, so Travis County and the City of Austin sought a more comprehensive approach to development. The plan covers incidental take from residential, commercial, and industrial construction as well as infrastructure projects. The permit covers almost all of Travis County and the City of Austin (about 600,000 acres) including 100,000 acres of already developed land. The plan expects an additional 30,000 to 60,000 acres of development. To minimize and mitigate take, 30,428 acres of habitat are slated for conservation in a land preserve system. Currently, 29,160 acres have been acquired for the preserve. Funding for land acquisition as well as operation and maintenance on the preserve is provided by a variety of sources including Travis County, the City of Austin, and fees from private landowners for development.

- **Six Points Road Interchange HCP (IN)**

This Six Points Road Interchange HCP developed in 2002 in response to concerns that development of the I-70 highway interchange and road improvements related to an airport expansion project would harm the endangered Indiana bat. The HCP covers a

3600 acre area within Hendricks and Marion Counties. To mitigate for the proposed impacts of the infrastructure projects, the Six Points Road Interchange HCP calls for both preservation of 375 acres of existing habitat within the HCP area as well as the creation of 345 acres of suitable bat habitat. Previously unprotected land was purchased to accommodate the new habitat. The Indiana Department of Transportation, the Indianapolis Airport Authority, Indianapolis Department of Public Works, the Indianapolis Department of Metropolitan Development, and the Hendricks County Board of County Commissioners formed a Task Force to implement the proposed roadway improvements and each agency contributed a portion of the cost for the development and operation of this HCP. In addition to habitat preservation and recreation, the plan also includes public education programs and requirements for activities conducted on the land.

- **State-Wide Karner Blue/Wisconsin DNR (WI)**

Although the Wisconsin HCP covers the entire state, the endangered Karner Blue Butterfly mainly resides in central Wisconsin and a pocket in the northwest corner of the state. This HCP, which was approved in 1999 for a ten-year period and updated in May 2010, targets this central habitat area, known as the High Potential Range. Under this HCP, partner groups, which include forest industry companies, county forest agencies, the state Department of Natural Resources, utilities, and state, county and local transportation agencies, must abide by a set of prescribed requirements designed to protect butterfly habitat. The blue butterfly depends on temporary short-term take for survival, so these requirements regulate management activities that do not result in permanent habitat destruction. For example, the HCP covers mowing grass on highway right-of-way that results in beneficial short-term take. Mitigation, however, is required for all activities in the High Potential Range that will result in permanent long-term take of the Karner Blue Butterfly. The HCP does not prescribe specific mitigation measures. Instead, a partner group consults with the state Department of Natural Resources and the federal FWS to develop a set of appropriate mitigation measures that might include mitigation on site, an alternate site, creation of a recovery property, or cash compensation to be used for recovery purposes.

#### **HCPs with off-site mitigation but without a focus on infrastructure**

- **Multiple Species Conservation Program (MSCP) for southwestern San Diego County (CA)**

The MSCP addresses multiple species and types of native vegetation communities for a 900-square-mile area in southwestern San Diego County. It identifies priority areas for conservation – a “preserve” – and other areas for future development, with the aim of improving certainty of development outside the preserve area. The MSCP was developed cooperatively by local jurisdictions and special districts with the goal of conserving native vegetation communities and associated species, rather than focusing preservation efforts on one species at a time. It presumes there will be direct economic benefits through the reduction of constraints on future development outside the preserve and the decrease in the costs of compliance with federal and state laws protecting biological resources.

The MSCP Plan does not impose major new restrictions on land use. Local jurisdictions and special districts will implement their respective portions of the MSCP Plan through subarea plans, which describe specific implementing mechanisms for the MSCP. The MSCP subarea plans contribute collectively to the conservation of vegetation communities and species in the MSCP study area. The combination of the MSCP Plan

and the local subarea plans serve as an HCP pursuant to Section 10 of the ESA. The subarea plans that met our criteria of having at least 1,000 acres are as follows:

- **County of San Diego Subarea Plan**
- **City of San Diego Subarea Plan**
- **City of Chula Vista Subarea Plan**
- **City of La Mesa Subarea Plan**
- **City of Poway Subarea Plan**

All five subarea plans allow off-site mitigation in the form of preserve acquisition, purchase of mitigation bank lands or credits, land trades (e.g., with BLM), transferable development rights, and/or payment of mitigation or similar in-lieu fees.

- **City of Carlsbad Habitat Management Plan (CA)**  
Approved in 2004 for 50 years, the Carlsbad HMP is a program to conserve 43 species of plants and animals while also reducing conflicts with and allowing reasonable land uses that are included in the city's growth management plans, including two golf courses. The preserve system is expected to be 6,786 acres and assembled through conservation of lands already in public ownership, contributions from private development projects, and public acquisition of private lands with habitat value from willing sellers. The HMP also includes a 206-acre mitigation bank for City capital improvement projects within Carlsbad, consisting of the City's Lake Calavera property. (Note: As Carlsbad is located in San Diego County, the HMP also serves as the City's MSCP Subarea implementation plan [see above for MSCP description].)
- **Coachella Valley Fringe-toed Lizard HCP (CA)**  
The Coachella Valley Fringe-toed Lizard HCP was approved in 1986 (the second ever) and comes with a 30-year permit. The HCP was entered into by Riverside County and five cities within the county, making it the first to incorporate several parties as official signatories. Out of a study area of almost 200,000 acres, it established approximately 20,000 acres of refuge and preserve land for the lizard. The HCP's funding has come from mitigation fees levied on development activity in the lizard's historical range. By the 1994, there was recognition that the lizard reserves did not fully capture the Coachella Valley's biological diversity, and a coalition of interests began working on a Coachella Valley Multiple-species HCP (see above). That multiple-species HCP – covering 10 listed and 17 non-listed species – was approved and granted its 75-year permit in 2008 (resulting in one of the longest HCP coordination and planning efforts to date) and incorporates and subsumes the fringe-toed lizard HCP and mitigation fees.
- **Riverside County Stephens' Kangaroo Rat HCP (CA)**  
The Stephens' Kangaroo Rat (SKR) HCP was approved in 1993 for a permit duration of 30 years, and establishes a regional reserve system. An SKR mitigation fee funds the plan, and there is also a program to acquire and expand the reserve by private-public exchanges of land. Since compliance with the HCP for purposes of SKR protection and mitigation does not preclude complying with the requirements for other species in the region, the RCHCA has recognized that such a single-species HCP is inefficient for both ecological and development purposes and is in the process of planning a multi-species conservation strategy for the County. The multi-species plan would incorporate coverage for the Stephens' Kangaroo Rat, and subsume most if not all provisions of the SKR HCP.

- **Lake Mathews Multi-species HCP (CA)**  
 Approved in 1995 and valid for 50 years, the Lake Mathews MSHCP creates a 5,110 acre multi-species reserve by adding 2,545 acres to the existing State Ecological Reserve around Lake Mathews. The HCP covers several types of Metropolitan Water District (MWD) planned capital projects. It establishes a mitigation bank for use by the MWD and RCHCA (the preserves two largest land owners), based upon the conservation value of the 2,545 acres to be added to the existing reserve, and allows RCHCA to trade land with BLM so that BLM assumes preserve lands and the management responsibilities that they require.
- **Orange County Central/Coastal HCP/NCCP (CA)**  
 The Orange County Central/Coastal subregion HCP was approved and issued a 75-year incidental take permit for 29 listed and non-listed species in 1996. It creates a habitat reserve system of nearly 37,400 total acres of various vegetative cover types and stipulates the establishment of a non-profit management entity to take the lead on long-range reserve assembly, management and monitoring responsibilities. Local governments within the roughly 208,000-acre subregion that signed onto the HCP's memorandum of understanding are responsible for collecting mitigation fees on development within the subregion but outside the reserve system. The plan authorizes urban development – including at least two golf courses – outside of the reserve system. It also recognizes that some new non-habitat uses (e.g. roads, flood control, sanitary landfill, utilities, water storage facilities) will need to be sited within the reserve and accommodates these. Mitigation for impacts can be onsite or off-site. Participating landowners include the county, cities, state and federal wildlife and resources agencies, transportation agencies, water and sanitation agencies and corporations, conservation and open space management institutions, and utility companies.
- **Metropolitan Bakersfield HCP (CA)**  
 The goal of the Metropolitan Bakersfield HCP (MBHCP) is to acquire, preserve and enhance native habitats which support endangered and sensitive species while allowing urban development to proceed as set forth in the Metropolitan Bakersfield 2010 General Plan. The study area covered by the MBHCP contains both City of Bakersfield and County of Kern jurisdictions, in California's central valley, and comprises 262,000 acres. The permit was approved in 1994 and is valid for 20 years. The MBHCP utilizes a mitigation fee paid by applicants for grading or building permits to fund the purchase and maintenance of habitat land to compensate for the effects of urban development on endangered species habitat. The ultimate goal of the MBHCP is to create and enhance habitat preserves comprising 10,000 acres or more, depending on the amount of urbanization for which there will need to be compensation. The lands to be acquired for the program are generally located outside the Metropolitan Bakersfield area.
- **San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (CA)**  
 The San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) provides a strategy for balancing the need to conserve open space and the need to convert open space to other land uses. Approved in 2001, it covers 42 species that are listed or of concern with respect to both federal and California endangered species statutes. The types of open space conversion activities which the SJMSCP provides compensation for include the following: urban development, mining, non-agricultural activities occurring outside of urban boundaries, levee maintenance,

transportation projects, school expansions, non-federal flood control and irrigation projects, and utility installation. The plan aims to preserve roughly 100,200 acres permanently. Project applicants have four options to receive coverage of the incidental take permit: (a) pay the appropriate in-lieu mitigation fee, (b) dedicate habitat lands as conservation easement or fee title, (c) purchase mitigation bank credits from a mitigation bank approved by the SJMSCP, or (d) propose an alternative mitigation plan, consistent with the goals of the SJMSCP and equivalent in biological value.

- **San Bruno Mountain HCP (CA)**

This is the HCP that started it all. San Bruno Mountain, located near San Francisco, provides a uniquely high-quality habitat for three species of federally listed butterfly. In the mid-1970s, plans for subdivision residential development catalyzed a movement to preserve as much of the mountain's open space and wildlife habitat as possible, ultimately leading to the 1983 approval of the country's first HCP. The primary implementation methods are conservation – or set-asides – of existing open space habitat, impact minimization with allowed development and maintenance activities, monitoring of the listed as well as threatened species present on the mountain, and measure to enhance the ecological value of butterfly habitat. The San Mateo County Department of Parks and Recreation operates the plan.

- **Washington County HCP (UT)**

Washington County is a fast growing county in southwest Utah that created an HCP to preserve and protect the Mojave Desert tortoise while allowing development to proceed in the County. The HCP calls for the establishment of a 60,000 acres wildlife preserve, within which uses will be carefully controlled as mitigation for incidental take. The preserve will be funded by collection of county-wide fees for building permits and land clearing. Under the HCP, incidental take is permitted for, among many uses, new roads, power and telephone, and cable lines, and water, sewer, and natural gas pipelines. However, Bob Sandberg, the Preserve Coordinator, thinks that road development outside the preserve but within the HCP area is unlikely.

- **Iron County HCP (UT)**

Endangered Utah Prairie Dogs primarily live on privately-owned lands in rapidly developing Iron County, Utah. The Iron County HCP intends to facilitate private development within Iron County while conserving and protecting the Utah Prairie Dog population. This HCP covers approximately one-third of the land in Iron County – all of which is privately owned; the remaining two-thirds are federally and state-owned and fall under the Section 7 consultation process. This HCP mainly authorizes the issuance of building permits, but incidental take protection is also offered to activities such as local roads and Christmas tree farms for which other permits are required. Developers seeking a building permit must pay fees to accommodate take, which is directed to the County's mitigation program. The HCP establishes a maximum annual take amount, and permits are issued in accordance to that amount. Additional take can occur through mitigation bank process, but this is not a main component of the HCP. The plan also identifies public lands suitable for prairie dog management, which receive translocated prairie dogs disturbed by development.

- **Bastrop Utilities (TX)**

Established in 2005, the Bastrop Utilities HCP covers approximately 142,526 acres within central, eastern, and northern Bastrop County and western Lee County. The four

entities that participate in this HCP are the Lower Colorado River Authority, Austin Energy, Bluebonnet Electric Cooperative, and Aqua Water. Covered activities, which include construction and maintenance of transmission, distribution, and water lines, may occur on approximately 4.8 percent of the permit area. Just under half the permit area is designated as critical habitat for the endangered Houston Toad. The HCP establishes best practices for avoiding and minimizing impacts to the Houston Toad such as selecting sites for construction and installation and guidelines for activities in permitted areas. Installation of new linear facilities (ex. pipelines, overhead wires) and fixed-foundation facilities, and routine and emergency repair and maintenance of linear and fixed-foundation facilities, that result in take are mitigated through fees paid by the utilities. The money collected from mitigation fees is used to fund conservation efforts for the Houston Toad. Although mitigation funds can be used to purchase Houston Toad land, the first and only use of mitigation funds to date is a study of the effects of fire and prescribed burns and other brush/understory management activities on Houston Toads and their habitat<sup>6</sup>.

- **Forty-Six Subdivisions in Bastrop County (TX)**

Whereas the Bastrop Utilities covers construction and maintenance activities for utilities within Bastrop County, this HCP focuses on residential development by facilitating conservation efforts for private landowners and subdivision development. The Bastrop Utilities plan describes that, "Individual lot-owners within the 46 subdivisions can participate by paying money into a fund, which thereby authorizes incidental take of Houston toads during construction and occupation of single-family residences." This 13,000 acre HCP was initially approved in 2000, but was recently incorporated into the larger Lost Pines Habitat Conservation Plan which covers 125,000 acres in Bastrop County. Infrastructure and maintenance are covered activities under the Lost Pines HCP, but according to the Roxanne Hernandez, the HCP coordinator, this mainly refers to maintenance of roadways and the expansion of dirt roads to city standard width<sup>7</sup>.

- **Indian River/Sebastian Areawide, Florida Scrub-jay Umbrella, City of Palm Bay (FL)**

These three independent HCPs cover land in southeastern Florida on which the endangered Florida scrub-jay resides. The City of Palm Bay HCP (46,000 acres) covers areas under City jurisdiction, and gives incidental take authority for small-lot residential and commercial development. Payments from individual lot-owners wishing to build on their property are used to purchase or and contribute to the cost of managing land scrub-jay habitat. The Indian River/Sebastian Areawide HCP (2500 acres) is similar. David Dell, the FWS Region 4 Coordinator explains that, "the Indian River/Sebastian plan covers more public works [than the City of Palm Bay HCP], namely maintenance of buffer areas around an airport, but also provides incidental take coverage for residential developments in the city limits."<sup>8</sup> This HCP does involve some on-site mitigation, but generally individual permittees pay into a third-party conservation fund that purchases viable land and maintains scrub-jay habitat. The Florida Scrub-Jay Umbrella HCP (15,000 acres) is available to lot-owners with one acre or less, for residential or

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<sup>6</sup>Email correspondence with Jennifer Leeper, Senior Environmental Coordinator, Lower Colorado River Authority - Transmission Services, May 2011

<sup>7</sup> Phone Interview with Roxanne Hernandez, Administrator of Bastrop County Lost Pines HCP on April 26, 2011

<sup>8</sup>Email correspondence with David Dell, U.S. FWS Region 4 HCP coordinator, May 2011

commercial development. As of April 2011, only one incidental take permit has been issued under this HCP<sup>9</sup>. The Umbrella HCP encompasses the area of other two HCPs, but individual lot owners in the covered areas of Palm Bay and Sebastian are not eligible to participate in the Umbrella plan. To mitigate incidental take under the Umbrella plan, landowners can either pay into the Scrub-Jay Conservation Fund or purchase credits from an approved mitigation or conservation bank.

- **Big Pine Key Deer HCP (FL)**

The Big Pine Key Deer HCP (7000 acres) covers incidental take of three endangered species from residential and commercial development and some transportation improvements in Big Pine Key and No Name Key. The specific transportation projects included in the HCP are local road paving and widening to accommodate bike paths and addition of a third lane on US-1. To mitigate incidental take, native habitat areas within the HCP are acquired and managed using development fees from individual landowners.

### **Public HCPs not related to our research question**

- **California Department of Corrections and Rehabilitation Statewide Electrified Fence Project HCP**

Placed between two parallel, chain-link, razor wire-topped security fences within the secured perimeter of each prison facility, the lethal electrified fences are meant to replace a much more labor-intensive – and therefore costly – system whereby 24-hour staffed guard towers surrounded each of 29 medium- and maximum-security prison facilities at regular spatial intervals around their secured perimeters. Since the perimeter areas containing the chain link fences were already disturbed habitat, and their construction covered under earlier California environmental reporting requirements, the installation of the electrified fences did not require a brand new environmental review process.<sup>10</sup> However, because some wildlife electrocutions were observed after the first prototype electrified fence was installed in 1993, CDCR decided to pursue a Section 10 permit. That permit was issued in 2002, is valid for 50 years and covers 46 species that are listed, threatened or of “special concern” under the federal ESA and/or California’s ESA (CESA), as well as bird species listed in a multi-national Migratory Bird Treaty Act. Although the HCP, as part of its mitigation strategies, utilizes a habitat compensation package that involves CDCR acquiring or funding the acquisition of off-site habitat acreage in habitat mitigation sites across California, the take permit was for a one-time project and is inappropriate for extension to non-CDCR applicants.

- **Hyundai Motor America Test Track HCP (CA)**

The Hyundai Test Track HCP permit was issued in 2004 and allows Hyundai Motor America and the City of California City to incidentally take desert tortoise habitat in an area of Kern County, Calif., as part of construction and operation of Hyundai’s automotive test course facility, a City water pipeline extension to service that facility, and three access/emergency paved roads totaling 5.5 miles in length. The proposed project was projected to result in impacts to or loss of approximately 4,368.5 acres of desert tortoise habitat. A portion – roughly one-quarter – of that habitat required no further mitigation or land acquisition compensation, as it was included in a private party land exchange with BLM. For the remaining habitat, Hyundai and the City have compensated

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<sup>9</sup>Email correspondence with David Dell, U.S. FWS Region 4 HCP coordinator, May 2011

<sup>10</sup> Phone interview with Nancy Mackenzie, Linda Leeman and Roxanne Henriquez of the CDCR on May 13, 2011.

by acquiring, and transferring fee title to the CDFG of, desert tortoise habitat of a higher conservation quality at a ratio of 1 acre to 1 acre, located in or adjacent to the Desert Tortoise Research and Natural Area preserve northeast of the City.

The purpose of Hyundai's automotive test course facility – dominated by a 6.4-mile paved oval track – is to test and evaluate the safety, performance and handling of prototypical and final-production automobiles manufactured at its Birmingham, Ala., plant, which was under construction at the same time that HCP planning and review was occurring for the test track. According to the HCP document, the expected usable life of the test track facility is 30 years, and that is the duration for which the Section 10 permit is valid.

- **Kern County Water Bank Authority HCP (CA)**

This HCP is unique in that it seeks not only to fulfill its own habitat and species conservation goals, but also to assist the mitigation goals of third parties in Kern, Tulare and King counties. The Kern Water Bank Authority (KWBA) received its 75-year Section 10 permit in 1997. KWBA is using and intends to use most of its 19,900-acre property to (1) bank water when available for later use in dry years and for overdraft correction, and (2) as re-created wetland/rangeland habitat that includes portions that have been pre-approved as conservation banks. For KWBA itself, the plan allows for the development of water recharge and recovery facilities, activities toward the re-creation of intermittent wetland/rangeland habitat (on portions that were historically under intense agricultural use), and continued agricultural uses on roughly 3,000 acres of the property. It also reserves to KWBA the right to use a small portion of the lands designated for the conservation bank for commercial development, if it chooses not to sell the corresponding mitigation credits. The plan covers 50 listed and non-listed species of wildlife.

- **City of the Dalles Municipal Watershed HCP (OR), Tacoma Water HCP (WA), Washington Department of Natural Resources Low-effect HCP for Commercial Geoduck Fishery (WA), Cedar River Watershed HCP (WA)**

These four HCPs in the Pacific Northwest are programmatic HCPs that cover water withdraw, maintenance activities, fish habitat restoration, and watershed management in their respective watershed areas. With the exception of the Geoduck Fishery HCP, each HCP protects a primary water source for a nearby city. For example, the Tacoma Water HCP (15,000 acres) covers incidental take from water utility operations in the Green River, the primary water source for Tacoma, Washington. The plan contains specific considerations for 32 species within the Green River watershed and covers operations including logging on upper watershed, operations of hydroplant, and flow in lower river. Enactment of the plan is intended to minimize incidental take and is therefore considered mitigation. Similarly, the Cedar River supplies Seattle with two-thirds of its drinking water so the Seattle Public Utilities developed an HCP to ensure water withdraw activities aligned with the ESA. The Cedar River Watershed HCP covers activities such as forest restoration, implementing and managing river flow regimes, providing for the safe passage of endangered fish in 90,000 acres of Cedar River watershed. In addition to water supply and watershed management activities, the HCP includes a set of mitigation and conservation commitments related to hydroelectric power supply on the River. The 90,000 acres is the upper two-thirds of the Cedar River Watershed and is closed to public activity; the HCP is designed to ensure Seattle complies with ESA requirements. Unlike the Dalles, Tacoma, and Cedar River HCPs, the Geoduck Fishery HCP does not protect a primary drinking source. Instead, it ensures geoduck harvest activities comply

with the ESA through rules on when and how geoducks are extracted from the Puget Sound. The area within these four HCPs is established when the incidental take permit is approved; none of these HCPs involve land acquisition as a mitigation tool.

- **Lower Colorado River MSHCP (AZ, CA, NV)**

The Colorado River, which is divided into Upper and Lower divisions, traverses 1,400 miles over seven states. The Lower Colorado Division (Arizona, California, and Nevada) extends from the Hoover Dam to the Mexico border and contains six endangered species. The Lower Colorado River MSHCP was established in 2005 to balance water uses for drinking and hydroelectric power with conservation of endangered species and their habitats over 700,000 watershed acres. There are 23 permittees under the plan, almost entirely consisting of public water agencies. The covered activities include water diversions and returns from existing facilities, present and future flow-related projects, and certain hydroelectric projects. Conservation measures include maintaining existing habitat, augmenting fish populations with recovery programs, and the creation of 8100 acres of riparian, marsh, and backwater habitat.

- **Montana Department of Natural Resources and Conservation Lands (MT), Washington Dept. Natural Resources Forest Lands HCP (WA), Washington Dept. Natural Resources Forest Practices HCP (WA), Elliott State Forest (OR)**

These four HCPs facilitate timber and logging activities within their respective areas. Each regulates activities on an established land area to protect endangered habitat. Although road construction and maintenance are typically covered activities under the plan, they are solely intended for timber clearance activities and are not public access roads. Often, the entire area within the plan is limited to commercial and state-management activities. For example, the Elliott State Forest HCP covers 93,000 acres in Coos and Douglas Counties, Oregon. Mitigation measures on this land include habitat management and enhancement through management basins, reserve areas, habitat conservancy areas, and riparian reserves and reforestation. Secondary forest transportation roads permitted as part of the HCP, but these are one-two lane gravel roads that allow truck traffic to pass for harvesting timber. The Washington Department of Natural Resources Forest Lands HCP covers activities on 1.5 million acres of state trust lands and state forest lands managed by the Department of Natural Resources. This HCP protects habitat for five endangered species while allowing the state to continue forest management and logging activities. The Washington Department of Natural Resources Forest Practices HCP and Montana Department of Natural Resources and Conservation Lands HCP are similar to the previous two HCPs in size and function.

- **State of Georgia (GA)**

A statewide HCP was approved for the endangered red cockaded woodpecker in 2000. Intending to relieve burdens on individual landowners, this HCP allows projects to proceed once replacement woodpecker groups have been created or equivalent habitat has been created in another location. However, according to Will McDearman, Red Cockaded Woodpecker Recovery Coordinator in the U.S. Fish and Wildlife Service, no landowners have enrolled in the HCP to date. Instead, landowners voluntarily manage woodpecker populations under a Safe Harbor Agreement, which provide incentives for private landowners to restore habitat without threats of additional regulatory restrictions.

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