UNDERSTANDING THE SPECIES MITIGATION MARKET IN THE UNITED STATES

PREPARED FOR THE NATURE CONSERVANCY

COLUMBIA UNIVERSITY INTEGRATIVE CAPSTONE WORKSHOP IN SUSTAINABILITY MANAGEMENT

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EXECUTIVE SUMMARY

As the United States transitions to a clean energy future, a commonly overlooked challenge is the large scale footprint that accompanies renewable energy development. The infrastructure of renewable energy, or "energy sprawl," is often developed on land with critical wildlife habitat.[1] In order for the United States to meet its ambitious renewable energy targets, it is important to accelerate renewable energy without negatively impacting threatened species and their habitats.

Habitat Conservation Plans (HCPs) approved by the Federal Government under the Endangered Species Act allow project developers to plan ahead in order to avoid, minimize and mitigate for the harm of their projects on threatened wildlife and habitats. The HCP program has been in place for more than 30 years, providing substantial levels of mitigation funding for conservation. However, as a mitigation market for species, the program is not well understood. Little is widely known about the national program's direction over time, the total amount of compensatory mitigation being delivered, and whether or not mitigation dollars are being directed to maximize conservation outcomes.

In this study, we sought to identify trends in the program, and to study the design and delivery of compensatory mitigation under a set of 30 HCPs. Since the first Plan was approved in 1983, 946 HCPs covering over 97 million acres of land nationwide have been implemented across the United States.[2] The most common type of permittee has been private individuals, comprising almost half of all the HCPs. Of these HCPs, one third involved a single permittee requesting to cover multiple development activities. The largest area of coverage of HCPs is in the Northeast region of the United States while the highest number of individual HCPs have been approved to date in the Southwest region. The average term of HCPs is 20 years, but terms range from one-year plans to 100 years in duration.

In the 30 plans we studied in detail, the planned compensatory mitigation totaled $6.3 billion dollars. The total area of habitat was to be preserved or restored under these plans amounted to over half a million acres. Given the large sums that are to be spent on critical habitat, it is essential that the delivery of the HCP program is able to be easily understood by all stakeholders- the US Fish and Wildlife Service (USFWS), which manages the program; communities; advocates, and developers.

Throughout our study, we encountered obstacles in accessing accurate, complete, and consistent information about HCPs. We, therefore, recommend improvements to the accessibility, accuracy, and consistency of this information. A first step in making these improvements would be to update and expand the national ECOS database of HCPs. The database, which is available online, is incomplete and inaccurate. The HCP program offers no easy way for stakeholders to track the implementation of the plans. We recommend that the ECOS database include both the permits that the USFWS issues

[1] McDonald, R. I., Fargione, J., Kiesecker, J., Miller, W. M., & Powell, J. (2009). Energy Sprawl or Energy Efficiency: Climate Policy Impacts on Natural Habitat for the United States of America. *PLoS ONE, 4*(8).doi:10.1371/journal.pone.0006802

[2] Our calculated total of 946 HCPs in the history of the program differs from the total (over 1000) stated in the USFWS's draft HCP Handbook (2016). In calculating the total number of HCPs nationwide, we omitted incomplete records found in ECOS and duplicate records due to amendments, which may explain the discrepancy.

to developers, as well as the annual progress reports that permittees produce, as there is no single repository for this information.

Moreover, we recommend the development of standardized metrics for the implementation of HCPs, and we propose a framework for reporting these metrics, which would allow stakeholders to more easily find and understand whether permittees were delivering on the commitments in their HCPs. This framework would outline commitments; the total funding spent to date; and a breakdown of cumulative spending by acres of land acquired and restored, and where applicable, total conservation bank credits purchased and withdrawn. Additionally, the framework would allow for the tracking of non-habitat based compensatory mitigation based on the following categories: Administration & Operations, Monitoring, Education, Research, Species Management and Other mitigation projects.

In order to understand the species mitigation markets under HCPs in the United States, it is important that cumulative compensation delivered to date is tracked. The integration of a high-level framework to track spending on mitigation projects under HCPs in the national database will provide a single location to input and monitor the progress of all plans in the history of the program, enabling all stakeholders to have a better understanding whether permittees were meeting their compensatory mitigation obligations, and delivering conservation outcomes across the country.

PROJECT BACKGROUND

The United States has established an ambitious goal to reach an 80% reduction in greenhouse gas emissions by 2050.[3] This will require the United States to maximize its renewable energy potential to meet its goal. However, a primary challenge to renewable energy is the large scale impact of development. Renewable energy, specifically wind, solar, hydropower, and biomass projects are anticipated to affect more than 50 million acres over the next twenty years-- an area equivalent to the size of the state of Minnesota.

The federal government, specifically the United States Fish and Wildlife Service (USFWS) is responsible for protecting species when they are at risk from development, particularly species that are listed as endangered under the Endangered Species Act (ESA). When development is anticipated to directly or indirectly impact listed species, developers are required under Section 10 of the ESA to prepare a Habitat Conservation Plan, outlining how they intend to mitigate the impacts to species and their habitats through avoidance, minimization, or compensation as part of their application for an Incidental Take Permit (ITP). In order to meet the greenhouse gas emissions reduction target, and protect habitats and species, Habitat Conservation Plans (HCPs) must be implemented and monitored to mitigate the impacts of development on species. Species mitigation policies and implementation strategies will help to protect habitats and species while continuing to drive renewable energy development in the United States.

Mitigation policy is now undergoing a transformation that seeks to ensure that when mitigation dollars are spent, it is strategically directed to support a landscape-level approach to conservation. The purpose of this project is to assess the characteristics, requirements, major trends and implementation methods of Habitat Conservation Plans under the ESA. We hope that our findings are able to advance more effective species mitigation markets that support both clean energy and nature conservation.

In order to understand the major trends in the evolution of Habitat Conservation Plans (HCPs) since the program's inception in 1983, we conducted a quantitative and qualitative analysis of all available and complete HCP records entered in the US Fish and Wildlife Service (USFWS) database, known as ECOS (Environmental Conservation Online System), totaling 946 Plans. The results of this Phase 1 analysis indicates several key trends and characteristics of HCPs categorized by type and number of permittees, activities, areal coverage, number of listed and non-listed species, geographic region, year of approval, and average duration.

Phase 2 of our assessment was to understand compensatory mitigation obligations and how they were designed by examining a smaller subset of 30 HCPs out of the 946 Plans. Analysis of the HCPs included understanding the amount of planned compensation; identifying the mechanisms for implementing compensatory mitigation obligations (i.e. permittee-responsible, third-party conservation bank, single-user bank sponsored by HCP permittee, in-lieu fee model, or other); understanding the anticipated impacts and planned offsets, as well as the timing of required compensation; and determining if compensatory mitigation was guided by landscape-level conservation approach.[4]

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[3] *FACT SHEET: U.S. Reports its 2025 Emissions Target to the UNFCCC*. (2016). *whitehouse.gov*. Retrieved 30 November 2016, from https://www.whitehouse.gov/the-press-office/2015/03/31/fact-sheet-us-reports-its-2025-emissions-target-unfccc

[4] Landscape conservation is an adaptive science-based framework that includes biological planning, conservation design, conservation delivery, outcome-based monitoring, and assumption-driven research.

In Phase 3 of the project, we analyzed the extent to which compensatory mitigation obligations for the subset of 30 HCPs were being delivered, and where mitigation funding was being directed including both habitat-based and non-habitat based mitigation projects. We did this by comparing the obligations set out under the Plans by obtaining a copy (where available) of HCP Progress Reports containing data on compensatory mitigation delivered to date.

METHODOLOGY

PHASE 1

To begin understanding the species mitigation markets, we first reviewed the USFWS national database ECOS (Environmental Conservation Online System) which contains a full history of HCP records. The goal was to analyze key HCP trends and characteristics across the program since 1983 including the number of Plans approved per year; geographical distribution; number of species covered; the area covered; the types of applicants and impacts; and the duration of the HCPs.

When comparing the ECOS database received from USFWS national headquarters[5] to the version available publicly online, we noticed discrepancies and inaccuracies in data recorded for the Plans, specifically inaccurate numbers of species covered and incomplete information. Therefore, to ensure we were working with the most accurate and complete history of HCP data for our analysis of general trends, we filtered out incomplete records in the original ECOS database and supplemented missing information with more complete species data contained in the ECOS database found online to create a more complete and accurate set of HCP records and data.[6]

The ECOS database was filtered and reduced from a total of 1,795 records to 946, based on the following criteria:

- Only Plans with status I and E were included to capture all Plans that had been either approved, or that had completed their established term. Plans for which the application was withdrawn were not included.
- Plans with no permit issued date were excluded, except for a few Plans that did have a permit but the information was entered incorrectly. The correct information was added from the online ECOS database.
- HCP records without duration information were excluded. For some HCPs the duration was added from the online ECOS database.
- HCP records without location information were excluded.
- HCPs with amendments were updated in our database to include in our analysis as a single HCP rather than considering individual amendments as duplicate HCP data.

The major discrepancy between the original ECOS database and the online version was incomplete species data. The original ECOS database only listed a maximum of a single listed and non-listed species.[7] However, the online version of ECOS recorded additional covered species for many HCPs. In order to capture species information and species counts in our analysis, the species data from the online version of ECOS was cross-referenced by plan title, allowing species data to be amalgamated into our aggregated HCP dataset. It is important to note that by conducting checks of several individual HCPs, it was found that the number of species listed in the online ECOS database did not exactly match the number of species listed in the final HCP documents.[8] There were also some HCP records that did not contain duration or permit issued data in the original ECOS database, but did list

[5] This was an excel download from the national ECOS database provided by USFWS to the TNC (referred to throughout the paper as “original ECOS database”).

[6] The methodology used to filter the ECOS database for analysis was based on Galik & Bowman’s 2014 Working Paper.

[7] It is unclear if the national database contains complete species data, with species data limited to a single data point only during the download process.

[8] This may be due to the HCP being a proposal to inform the Incidental Take Permit, which when approved, may contain less covered species than the HCP had outlined.

this information online. These records were also combined to create the final aggregated database for analysis.[9]

PHASE 2

From our complete ECOS database, we selected a subset of 30 HCPs to analyze how compensatory mitigation obligations have been designed, and to understand whether or not they are taking a landscape-level approach in their delivery of compensatory mitigation projects. Our methodology for selecting the 30 HCPs included a combination of filtering the ECOS database and consulting with The Nature Conservancy and USFWS representatives (Figure 1). To select the 30 HCPs for analysis, we:

- Filtered the ECOS database according USFWS Regions to ensure representation of HCPs from each geographic area.
- Excluded HCPs with no information on size (areal coverage).
- Applied selection criteria of: Large areal coverage, recently approved (year 2000 onwards), and containing multiple species.

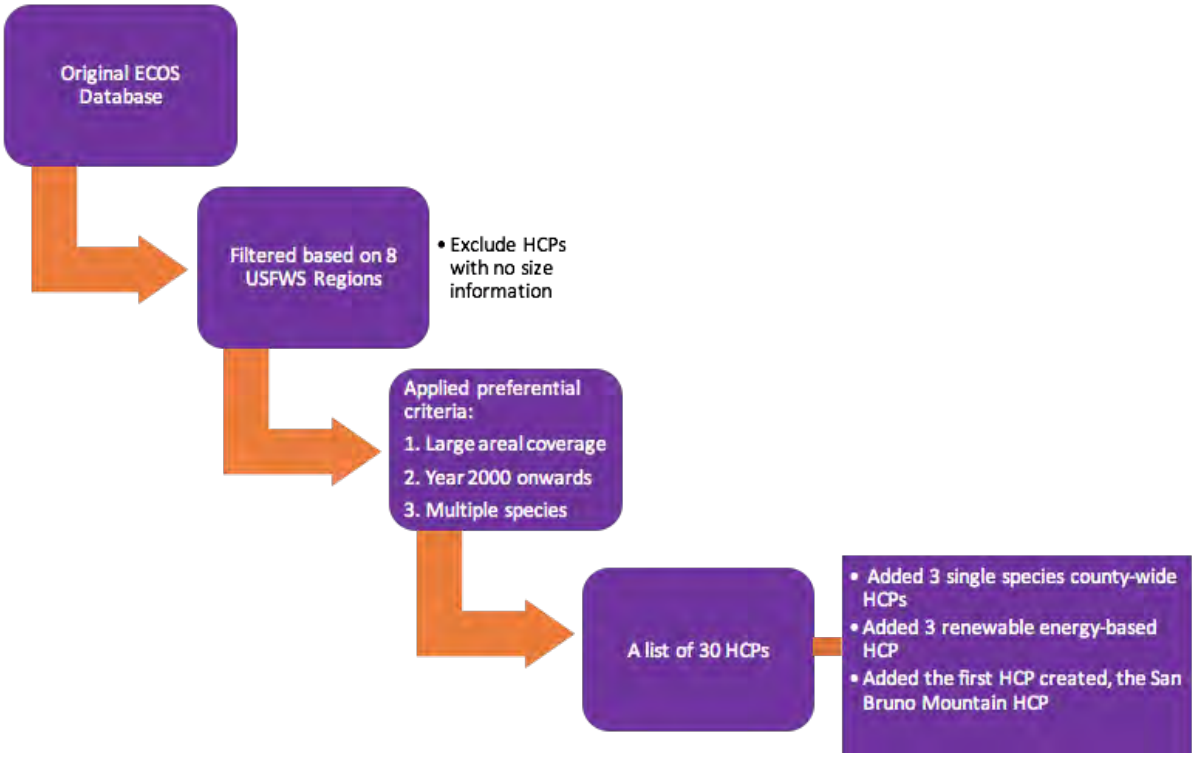


Figure 1: Methodology for selecting the subset of 30 HCPs for detailed analysis.

In applying this set of criteria, we faced challenges ensuring that the HCPs targeted for analysis were designed to deliver compensation via a landscape-level approach. In discussing the selection of HCPs with the USFWS, we learned that HCPs with single species and smaller in size could also model

[9] This database is available as part of the deliverables accompanying this report. Refer to excel spreadsheet "Task 1 - ECOS HCP Nationwide Data Analysis.xls", to locate the aggregated dataset in the first tab.

landscape-level plans if they were adopted at the county or statewide level. Hence, we revised the list to include the following Plans based on our consultation with TNC and USFWS:

- Included interesting examples of single species county-wide HCPs such as Wisconsin Statewide Blue Karner Butterfly and Washington County.
- Added three recent renewable energy project HCPs that were not found in the ECOS database: Midwest Wind Energy MSHCP, Buckeye Wind Project HCP, and Wright Solar Park HCP to ensure that our analysis would be inclusive of newly developed renewable energy development related HCPs.
- Included the San Bruno Mountain HCP as it was the first HCP created in 1983 and would provide a useful comparison to the more recent HCPs. [10]

This resulted in a selection of 30 HCPs as depicted in Figure 2 below. One-page summaries for each HCP are also included in Appendix A.

[10] Donner, A. (2016). *Endangered Species Bulletin*. Retrieved 30 November 2016, from https://www.fws.gov/pollinators/pdfs/fall2010-p26.pdf

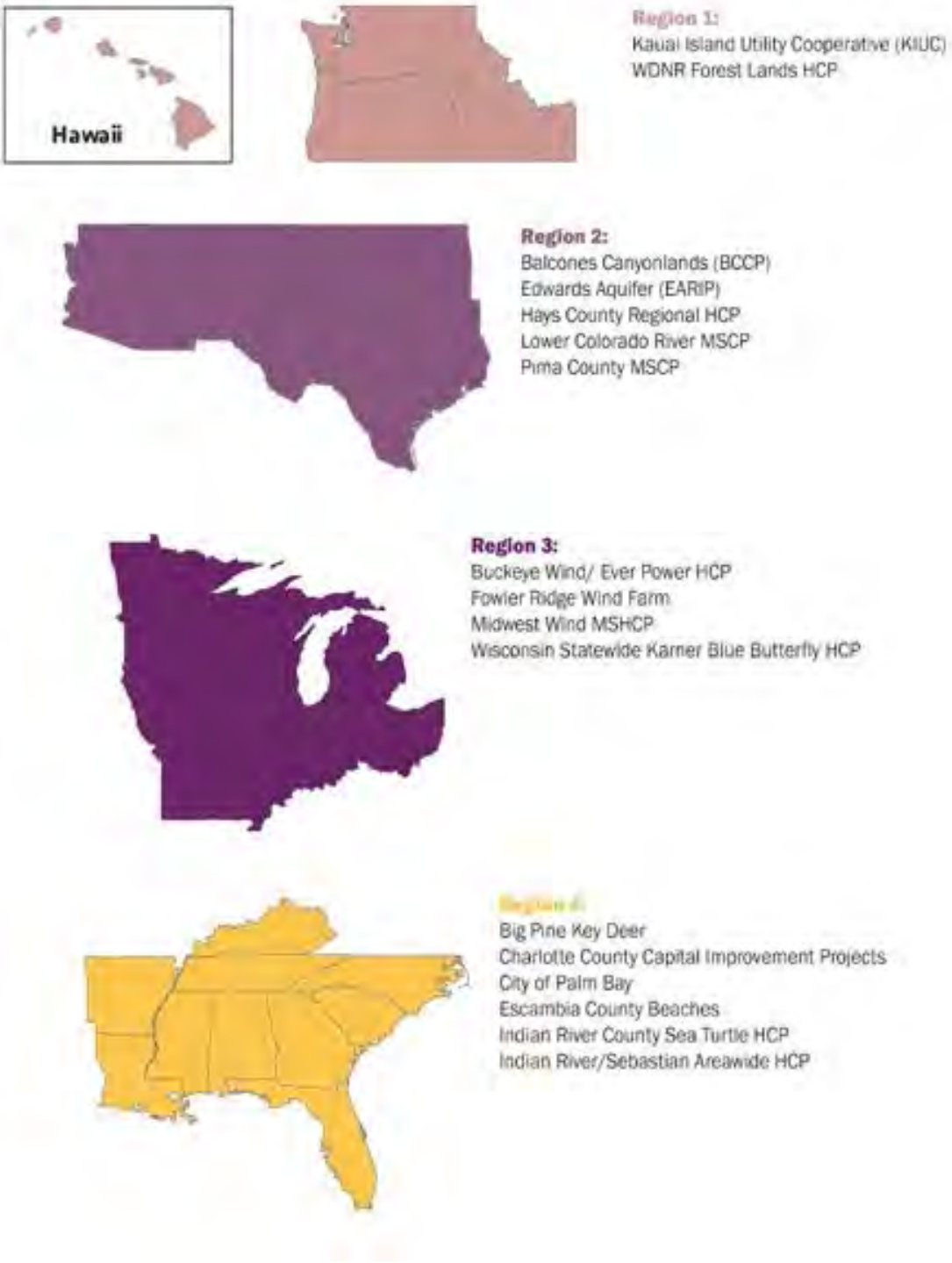


Figure 2: Selection of the 30 HCPs and their Corresponding Regions.

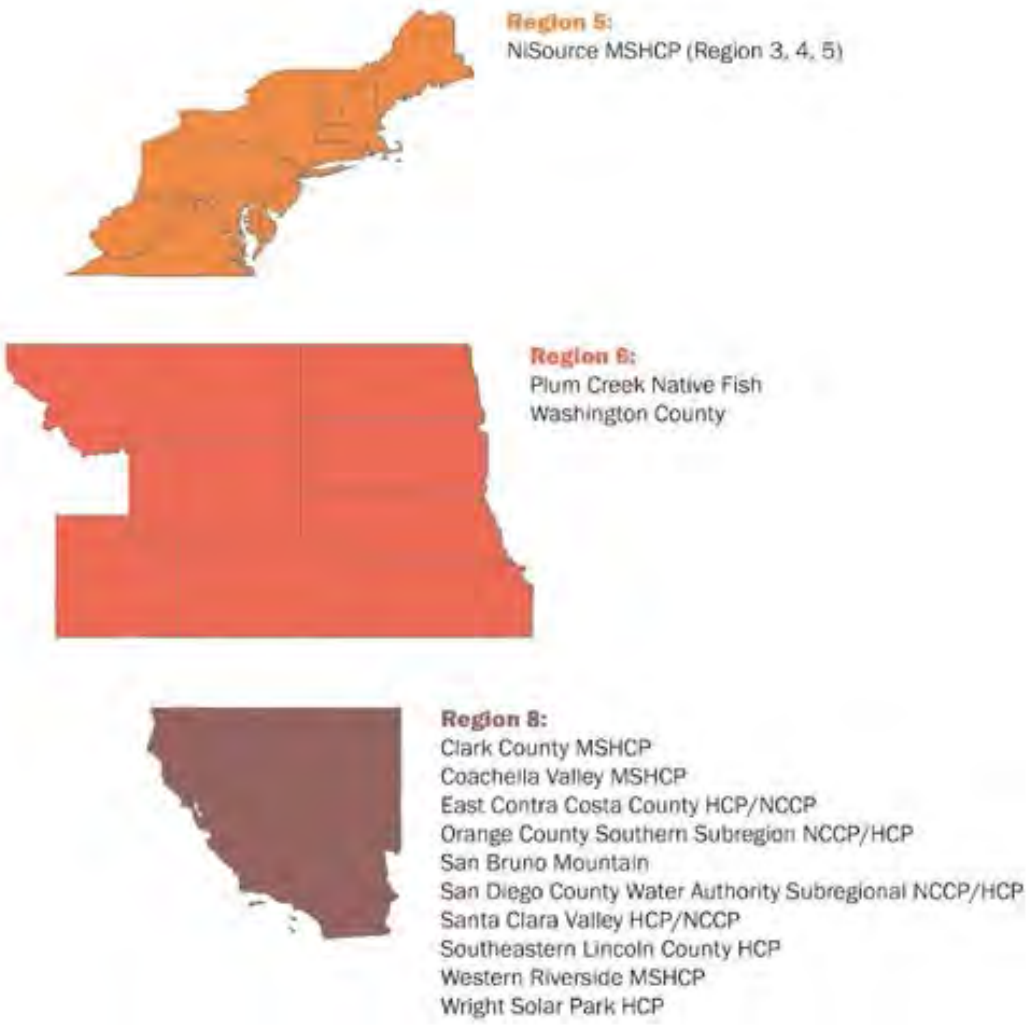


Figure 2 (continued): Selection of the 30 HCPs and their Corresponding Regions.

To address the gap in understanding the amount of compensation that has actually been delivered, we collected data on compensatory mitigation delivered to date for the 30 selected HCPs. We hoped to gain insight from the regional USFWS coordinators through interviews, but given their limited availability, we instead consulted publicly available information including progress reports, dedicated HCP websites, city, county, and state websites. Where information was not available online, we conducted outreach to project managers, consultants and county biologists, who had been a part of the process to draft the original HCP or were currently involved in the implementation and/or monitoring of the Plans. For the set of 30 HCPs, progress data was collected including information on:

- Total compensation permittees delivered to date, in dollars
- Total mitigation funding permittees spent to acquire or restore habitat
- Total area of acquired or restored land (in acres)
- Total mitigation funding permittees spent on non-habitat based mitigation activities or functions (these include administration/operations, monitoring, education, research, species management and other).
- Timing of the delivery of compensation
- Whether or not compensation is being delivered to priority areas under a landscape-level plan. [11]

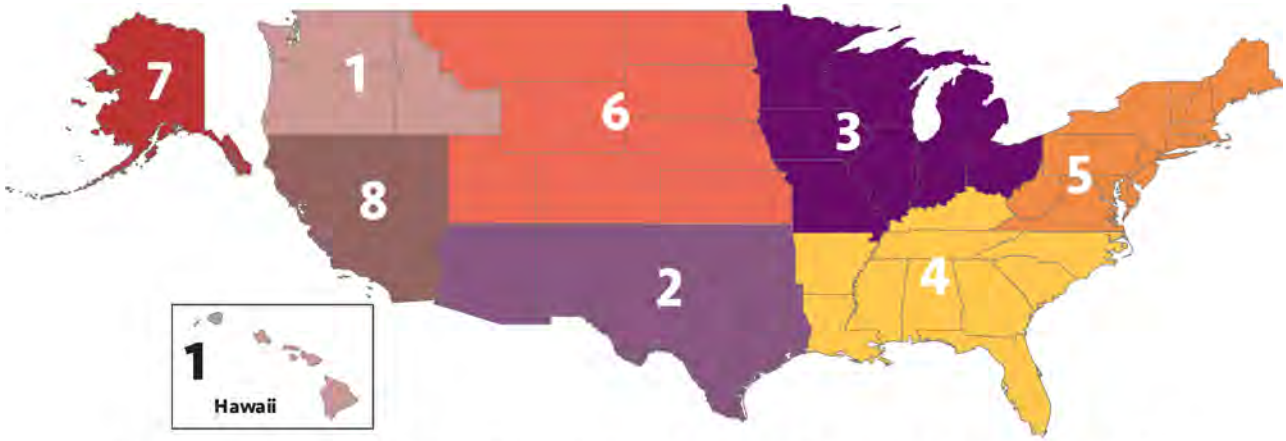
[11] Priority areas are sections of the protected land that are vital habitat for endangered species.

FINDINGS

The following sections detail the analysis and key findings. Phase 1 identifies major trends in HCP development; phase 2 presents an analysis on how compensatory mitigation obligations are designed; and phase 3 aims to quantify the amount and classify the type of compensatory mitigation delivered.

PHASE 1: UNDERSTANDING BROAD HCP TRENDS

We reviewed the summary dataset from the ECOS database in order to analyze key trends in the number of HCPs approved per year and by geographical distribution, the duration of HCPs, the applicant types and impacts, the number of species covered in the HCPs, and the total area covered by the HCPs. The following sections contain a breakdown of our findings.



Region	Total Area (Acres)	Areal Coverage	Average Number of Listed Species	Average Number of Non-Listed Species	Average Duration (Years)
1	13,701,590	14%	3.63	8.13	36.17
2	14,434,765	15%	1.26	0.34	10.57
3	16,959,264	17%	1.57	0.21	22.18
4	11,480,981	12%	1.03	0.05	27.15
5	22,652,909	23%	0.67	0.42	20.33
7	N/A	N/A	N/A	N/A	N/A
6	2,239,002	2.3%	1.13	0.84	16.95
8	15,793,619	16%	3.36	5.89	21.54

Figure 3: Summary of Key Findings of HCP Trends. This figure represents a summary of the broad findings from the analysis of all 946 HCPs within the aggregated ECOS Dataset, which will be explained in further detail throughout the document. The table summarizes by Region the total area of approved HCPs, the percentage of areal coverage, the average number of listed species, the average number of non-listed species, and the average annual duration of HCPs.

APPROVED HCPS AND DURATION

The HCP program started slowly, gradually building momentum in terms of HCPs approved per year, with the largest number approved in 2001 (128 plans). The number of HCPs approved annually has now decreased, with only two plans approved in 2015. During the span of the HCP program, we identified 1995 and 2001 as peak-approval years, with 87 and 128 HCPs approved respectively. There is a trend of increasing average duration of HCPs, with the average term of 24 years for plans approved in the past 5 years. Although only one plan for 2016 is currently recorded in ECOS, this plan is for a term of 30 years (Figure 4). The majority of HCPs (530) have a duration of up to ten years, and the average duration of HCPs across the lifetime of the program is 20 years.

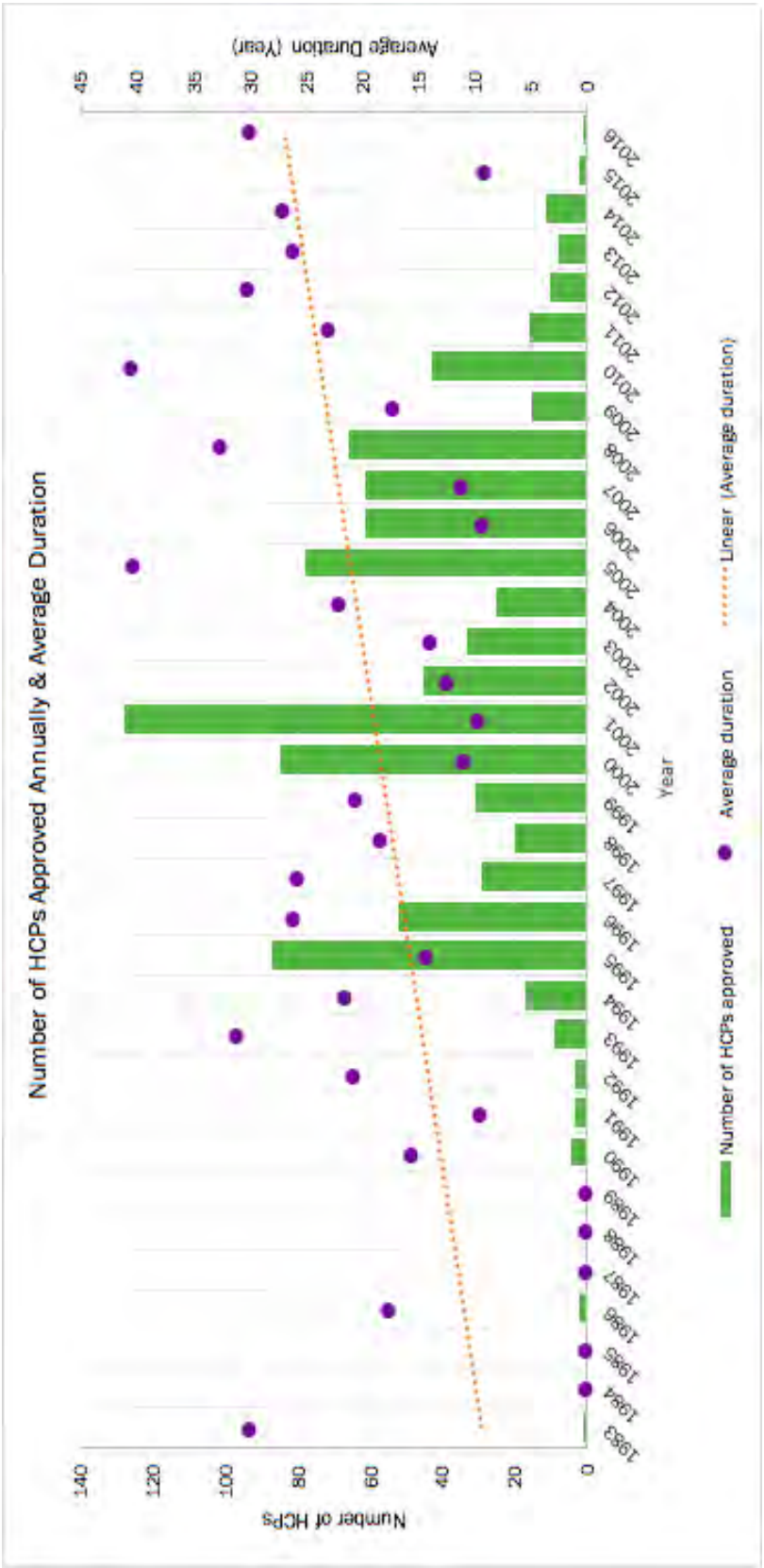


Figure 4: Number of HCPs Approved Annually and Average Duration.

ACTIVITIES AND PERMITTEES

Approximately 33% of HCPs (308 HCPs) were requested by a single permittee to cover multiple development activities. We observed an increase in multiple permittees for both one activity and multiple activities between 1995 and 2010. However, the first ten years of the program were slow with only a handful of new HCPs approved each year.

The results of the analysis do not indicate that HCPs with multiple activities and/or permittees are more common in recent years relative to previous years, which could have been indicative of a move towards a landscape-level approach. The major type of permittee driving the development of HCPs across the history of the program has been private individuals, comprising almost half (43%) of all the permittees, followed by corporations as the second most common applicant type, constituting approximately 29% of all HCP permittees. There is no trend for specific types of activities and applicants.

Figure 5 shows the number of activities covered and permittees involved for all HCPs. The major findings with analysis over time include:

- Most of the HCPs with one permittee for a single activity were approved in 2005 (58 HCPs).
- Most of the HCPs with one permittee for multiple activities were approved in 2000 (53 HCPs).
- Most of the HCPs with multiple permittees for a single activity were approved in 2005 (11 HCPs).
- Most of the HCPs with multiple permittees for multiple activities were approved in 2001 (63 HCPs).
- The majority of HCPs approved between 1983-2016 were for single permittee requesting approval for one activity.

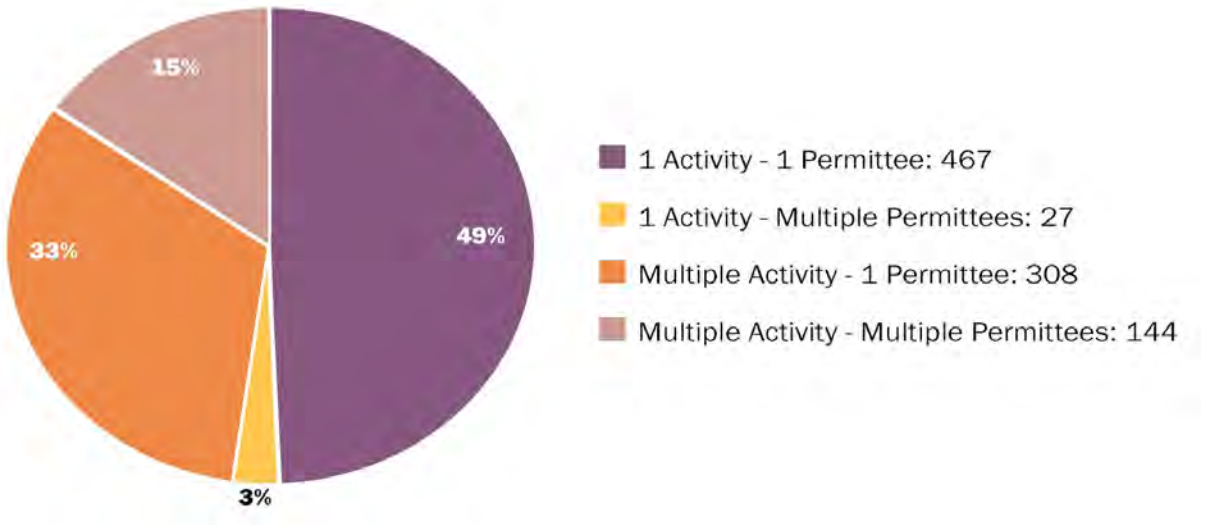


Figure 5: HCPs Characterized by Number of Activities and Permittees.

SPECIES

Across the 946 HCPs, approximately one quarter (24%) covered multiple species. Region 4 had the highest number of HCPs covering non-listed species (314 HCPs). The overall average number of listed species per Plan was 1.8, while the overall average number of non-listed species per Plan was 2.24.

Region 1 in the Pacific Northwest has the highest average number of non-listed species and the highest number of listed species covered (Figure 6). The single 2016 Plan listed 11 species in total, which is a significantly high species count compared to the average number of species covered throughout the history of the program. Comparatively, in 2004, the highest average number of non-listed species per plan was approximately seven (Figure 7).
This may indicate an increasing trend in the number of listed and non-listed species on average for HCPs, but due to the inaccurate species data contained in the ECOS database, it is difficult to make concrete conclusions.

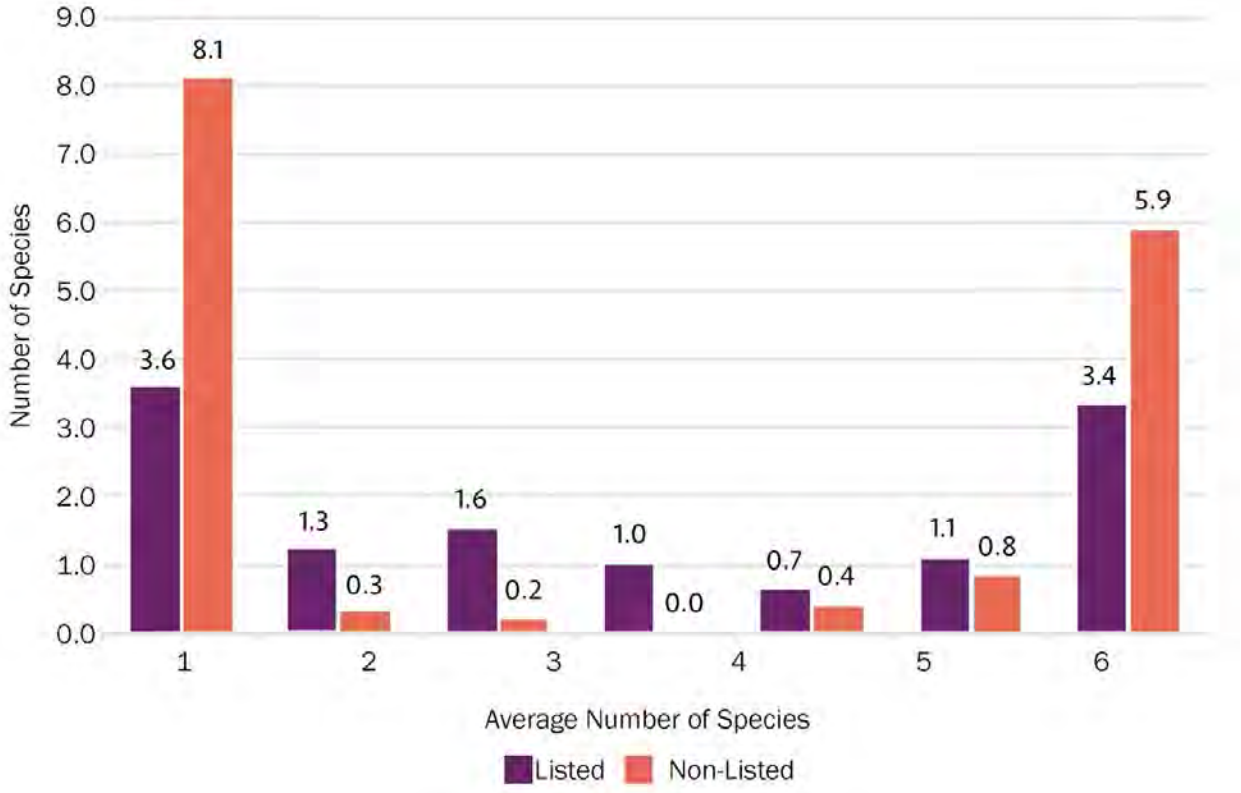


Figure 6: Average Number of Listed and Non-Listed Species Covered per HCP by Region.

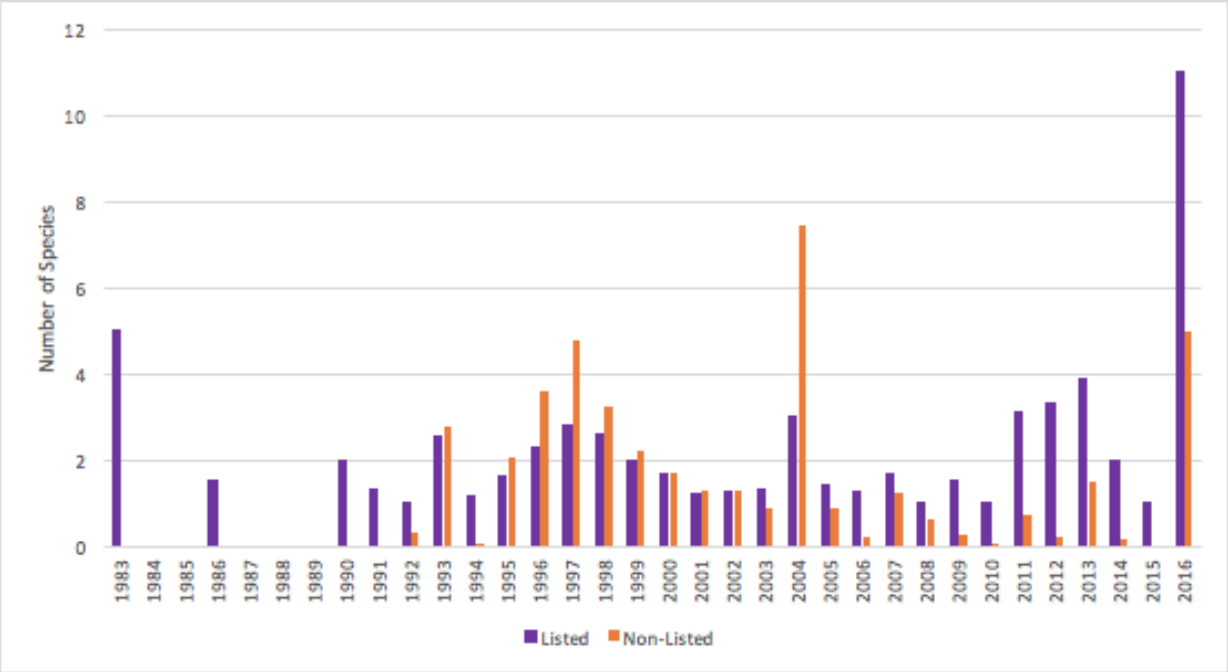


Figure 7: Average Number of Listed and Non-Listed Species per Year.

AREAL COVERAGE

Across the history of the HCP program, the 946 HCPs analyzed in our study covered an area of over 97 million acres nationwide. Calculating the aggregate area covered by all HCPs for each region, Region 5 (the Northeast) had the highest areal coverage, representing 23% of the total geographic area covered by all HCPs across the United States (Figure 8), while Region 2 had the highest number of individual HCPs approved to date (351 Plans). Between 1983 and 1992, only 13 HCPs were approved, which resulted in low additional areal coverage during these years (609,582 acres). HCPs that had permits issued in 2014 cover the largest area: 23 million acres (23,095,449 acres) in total. In 2001, although a high number of Plans were approved (128 in total for the year), these Plans only covered a relatively small area of six million acres (6,061,282 acres). The average number of acres approved per year is just over three million acres (3,353,556 acres), while the average number of acres approved by Region is just under 14 million acres (13,893,304 acres). Due to incomplete data records in ECOS, the total areal coverage of HCPs nationally may be higher as only HCPs with areas quantified in acres were included in our analysis. This excluded HCPs that had coverage defined in linear miles (for example Plans that ranged along a river or stream), and HCPs missing acreage data in ECOS (listed as 'No info').

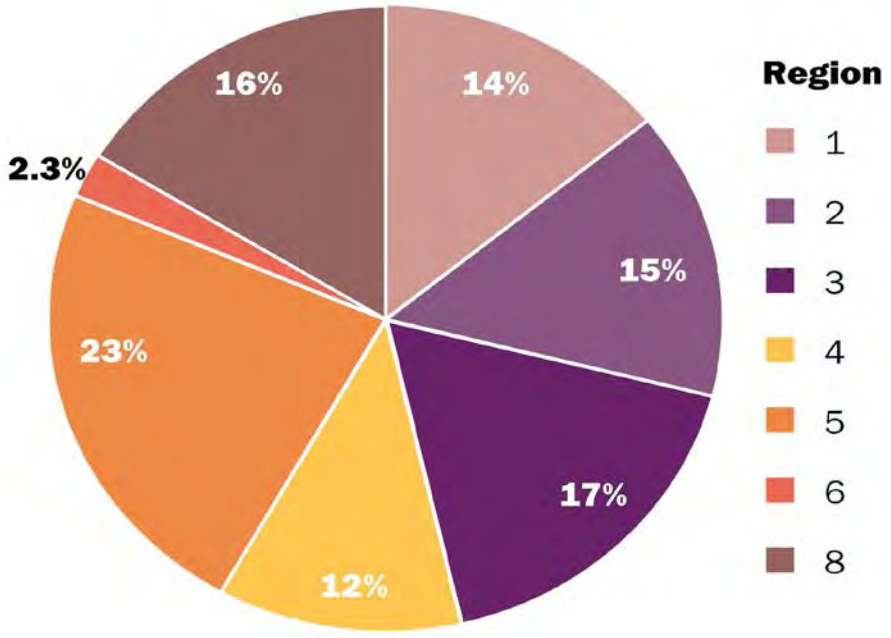


Figure 8: Percent Areal Coverage by Region.

PHASE 2: ANALYZING THE DESIGN OF COMPENSATORY MITIGATION OBLIGATIONS UNDER HCPS

We reviewed a set of 30 HCPs in order to understand how compensatory mitigation obligations were structured. We analyzed the total amount of compensation the HCPs outlined; the mechanisms used to carry out the compensation (such as permittee-responsible, conservation banks, in lieu-fee models and others); how impacts and offsets were being quantified; the timing of compensation; and if HCPs were directing the delivery of compensation at a landscape-level (with model examples of a landscape-level approach).

AMOUNT OF COMPENSATION

Our analysis indicated that 25 plans included a total projected budget across the term of the HCP for compensatory mitigation (in dollar terms). There were 22 plans with a target for the number acres of land the permittee(s) would acquire, preserve, or restore for species and habitat conservation. 73% of the plans (22 out of the 30 plans) had both a projected total budget and a land acquisition goal (in acres). There were four plans that did not include any compensatory mitigation obligations. The total amount of compensation for the 30 plans reviewed was $6.3 billion and 574,379 acres of protected land (Figure 9).

Figure 9: Compensatory Mitigation Planned in Dollars and Acres for the Subset of 30 HCPs.

The two Plans with the largest planned compensatory mitigation were Western Riverside HCP and Coachella Valley HCP. Coachella Valley had a total budget of $2.04 billion with the goal to create a Reserve System consisting of approximately 723,480 acres out of which permittees have an obligation to conserve approximately 115,140 acres in the Conservation Areas.[12] The extensive budget covered costs for land acquisition, land improvement, monitoring, management, adaptive management and the management of a contingency fund.[13] The Western Riverside MSHCP had a total budget of $1.5394 billion, of which $733.6 million is earmarked for the purchase of land for creation of a reserve system of over 500,000 acres to mitigate development impacts on 146 species.[14] The rest of the funds will be used to finance the acquisition of additional reserve lands and will cover management, monitoring, adaptive management and administrative costs.[14]

Both Coachella Valley and Western Riverside County have the largest budgets for compensatory mitigation, which could be attributed in part to the extensive length of the 75-year Plans. Land acquisition costs account for the largest portions of the budgets, making up over 45% of expenditures for both HCPs. In addition, both Plans cover multiple species with multiple permittees and multiple habitats types. The funding for these Plans are sourced from local development mitigation fees, mitigation trust fund, mitigation for infrastructure projects and other sources including landfill tipping fees.[14] Funding for the long term is secured in perpetuity for both Plans by the establishment of an Endowment Fund. The Coachella Valley HCP's Endowment Fund was seeded with $3.2 million and will be fully funded with an additional $82 million. Interest earned on the endowment capital, projected to be approximately $950 million across the 75-year term, will be used to fund the ongoing monitoring and maintenance of the reserve system. In the case of Western Riverside MSHCP, the endowment fund will reach approximately $100 million by the first 25 years of

[12] CVAG MSHCP Plan Section 1.0 & Section 4.0 (2007) (pg. 1-2, 4-13), *Final Recirculated Coachella Valley Multiple Species Habitat Conservation Plan*. pg. 4-13 Retrieved from http://www.cvmshcp.org/Plan_Documents_old.htm

[13] CVAG MSHCP Plan Section 5.0 Costs of and Funding for Plan Implementation (2007) (pg. 5-5). *Final Recirculated Coachella Valley Multiple Species Habitat Conservation Plan*. Retrieved from http://www.cvmshcp.org/Plan%20Documents/12.%20CVAG%20MSHCP%20Plan%20Section%205.0.pdf

[14] Section 8.0 MSHCP Funding/Financing of Reserve Assembly and Management (2003). *Western Riverside County MSHCP*. Retrieved from http://wrc-rca.org/Permit_Docs/MSHCP_Docs/volume1/Vol1-Sec8.pdf

the Plan. Proceeds from the Western Riverside endowment are anticipated to cover approximately one half of the ongoing management costs for the conserved lands after the MSHCP Conservation Area has been completely assembled.[15] In both cases, the endowment fund ensures that in the absence of development and associated permit revenue, funding will remain available beyond the duration of the HCP for ongoing preserve management.

The HCP with the smallest compensatory mitigation budget was San Bruno Mountain, with a funding commitment of $1.8 million over the 30-year permit period. The San Bruno Plan was the first HCP to be approved in 1983 when the mountain, the last remaining known habitat for the endangered Mission blue butterfly, was at risk from housing development. The Plan aimed to preserve the butterfly habitat by protecting most of the mountain area (2,800 acres) while allowing landowners to develop about 300 acres. With development on the mountain now essentially completed, as highlighted in the 2015 Annual Progress Report for the Plan, without a revenue stream from development permits, the Plan now faces ongoing funding constraints to carry out essential habitat management activities such as invasive plant removal. This threatens the long-term viability of the protected land as habitat for the endangered butterflies.

Indian River County Sea Turtle HCP had the smallest land acquisition target. The Plan did not account for any future compensatory mitigation, but allowed the permittees to purchase several beachfront properties covering 110 acres at a cost of $13.2 million before receiving its permit. The properties referred to as the Jungle Trail Conservation Area (JTCA) served as partial mitigation for unavoidable impacts to sea turtle resulting from shoreline protection measures.[16]

Four Plans that did not outline financial budgets for compensatory mitigation measures were Wisconsin Statewide Karner Blue Butterfly (1999), Midwest Wind MSHCP (2017), Plum Creek Native HCP (2000) and WDNR Forest Land (1997). Plum Creek Native HCP and WDNR Forest Lands differ in their design and structure from other HCPs in our 30 Plan sample. Both of these Plans are forestry focused, with management based on avoidance and minimization measures such as best management practices for new logging roads, grazing and riparian management zones. Midwest Wind HCP was still in the draft phase and had yet to specify a detailed breakdown of monetary compensation other than the estimated implementation cost of the Plan totaling $11.7 million over 45 years. The Wisconsin Statewide Karner Blue Butterfly is a unique HCP as it was developed by over 40 partners, a voluntary group of public and private land managers which has contributed to its success with the continued existence of the butterfly on more than 260,000 acres in Wisconsin to date.[17] A compensatory mitigation Plan is decided between permit holders, the DNR and FWS when permanent take is anticipated.[18]

There were three Plans that specify a total compensatory mitigation amount in dollars but did not set the acres of mitigation land upfront: Clark County HCP, City of Palm Bay, and Edwards Aquifer. City of Palm Bay established an Environmental Fee Fund through which funds will be channeled to the National Fish and Wildlife Foundation for the purpose of land acquisition and maintenance of suitable habitat for the scrub-jays but did not calculate the total acres of land that would be required

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[15] Ibid, pg. 8-24.

[16] *Habitat Conservation Plan: A Plan for The Protection of Sea Turtles On Eroding Beaches in Indian River County, Florida.* (2003) (2nd ed.). Jensen Beach, Florida. Retrieved from http://www.ircgov.com/Departments/Public_Works/Coastal_Engineering_Section/HCP.pdf

[17] *Draft Habitat Conservation Planning Handbook*. (2016) (2nd ed., pp. 1-5). Retrieved from https://www.fws.gov/endangered/esa-library/pdf/HCP_Handbook-Draft.pdf

[18] Wisconsin Department of Natural Resources. (2015). *Karner Blue Butterfly - Frequently asked questions - Wisconsin DNR*. [online] Available at: http://dnr.wi.gov/topic/ForestPlanning/karner/hcpFAQs.html [Accessed 30 Nov. 2016].

to compensate for take of the species.[19] Conversely, the Indian River/Sebastian Area-wide HCP was the only Plan that had specified acres of Florida scrub-jay habitat conservation without any associated funding.

We found that many of the larger and/or newer HCPs (13 out of the 30 Plans) had more comprehensive compensatory mitigation obligations, with a solid financial base to fund land acquisition, habitat restoration, monitoring, administration, and adaptive management costs over the lifetime of the Plans. HCPs that had clearly-defined budgets and funding mechanisms include Buckeye Wind Project (2013), Charlotte County (2008), Coachella Valley MSHCP (2008), East Contra Costa County HCP/NCCP (2007), Fowler Ridge Farm (2014), Hays County (2012), Lower Colorado River HCP (2005), NiSource (2013), Pima County (2016), Santa Clara (2013), Southeastern Lincoln County (2010), Western Riverside MSHCP (2004), and Wright Solar Park (2015). Some far-sighted HCPs such as Coachella Valley, Orange County, Clark County and Western Riverside MSHCP included the creation of an Endowment Fund to secure financing in the long-term for monitoring and adaptive management purposes.[20]

For Plans that did not have absolute funding/mitigation amounts such as Clark County, Escambia County Beaches, and San Bruno Mountain, we calculated the estimated total compensation based on its per acre mitigation or development fee and multiplied this with the expected number of acres that would be affected.

There were six Plans that had non-habitat based compensatory mitigation in dollar values. Some examples of non-habitat based compensatory mitigation are education for Washington County and Clark County, deer population counts for Big Pine Key Deer, and research related to the Indiana bat species for Buckeye Wind Project.

IMPLEMENTATION METHOD

Permittees are responsible for ensuring development impacts are offset through mitigation activities or obligations. The primary implementation methods are: Permittee-implemented or permittee-responsible mitigation, third-party conservation banks, single-user bank sponsored by HCP permittees, in-lieu fee model, and others. Six of the thirty HCPs reviewed used a combination of three of the four main implementation methods, ten Plans used two implementation methods, 12 Plans used a single implementation method, and two Plans have non-standard implementation methods that are categorized as "other" (Table 1).

East Contra Costa County HCP/NCCP is a Plan that employs several types of implementation methods including permittee-responsible and use of mitigation banks. For this Plan, an organization was created to oversee assembly and operation of the HCP/NCCP preserve system. The implementing entity is called the "East Contra Costa County Habitat Conservancy" (Conservancy) and is run by a consortium of groups, including representatives from the cities and the County. The Conservancy ensures the costs to future development are in proportion to the impacts caused by that development (permittee-responsible implementation). In addition, the Plan specifies use of conservation or mitigation banks where the bank operator sells habitat credits to developers to

[19] *Habitat Conservation Plan of the City of Palm Bay*. (2005) (1st ed., p. 41). Jacksonville. Retrieved from http://www.palmbayflorida.org/government/departments/growth-management-bldg-permits-hands-p-z-/building-permits-inspections/habitat-conservation-plan

[20] *Multiple Species Habitat Conservation Plan (MSHCP) - Volume 1 - Section 8.0*. (2003). *Western Riverside County Multi Species Habitat Conservation Plan*. Retrieved from http://www.rctlma.org/Portals/0/mshcp/volume1/sec8.html#8.8

compensate for environmental impacts of their development projects. The Plan also specifies conservation mitigation measures in the form of conservation easements, accepting land as a gift or charitable donation with conservation benefits, and land dedication in lieu of a development fee.

Edwards Aquifer Authority Recovery Implementation Program is another Plan with a unique implementation method that utilizes "aquifer management fees" and third-party contributions to fund implementation of the HCP. The Edwards Aquifer Authority issues municipal and industrial permits to those who wish to withdraw groundwater from the aquifer and the cost of mitigation measures will be borne by the holders of the permits and be paid as aquifer management fees. Third-party contributions are paid to the Edwards Aquifer Authority by entities who are not withdrawing groundwater from the aquifer and therefore, are not paying aquifer management fees.

Additional Plans with "other" implementation methods include measures like cooperative agreements with private landowners (Balcones Canyonlands, Wisconsin Karner Blue Butterfly), and implementation by third-party appointed "experts" (City of Palm Bay, NiSource, Kauai Islands).

Table 1: Implementation Methods of the 30 HCPs

Habitat Conservation Plans	Permittee-Responsible	Third-party conservation bank	Single-user bank	In-lieu fee model	Other
Hays County Regional HCP	✓		✓	✓	
Midwest Wind Multi-Species HCP	✓	✓		✓	
Western Riverside MSHCP	✓	✓		✓	
Pima County County Multi-Species Conservation Plan	✓	✓		✓	
Balcones Canyonlands (BCCP)	✓	✓		✓	
Coachella Valley Multiple Species HCP	✓	✓		✓	
Clark County Multiple Species HCP	✓			✓	
NiSource MSHCP	✓	✓			
Charlotte County Capital Improvement Projects	✓		✓		
San Diego County Water Authority Subregional NCCP/HCP	✓		✓		
Orange County Southern Subregion NCCP/HCP	✓			✓	
Buckeye Wind/Ever Power HCP	✓	✓			
Fowler Ridge Wind Farm	✓	✓			
Santa Clara Valley	✓			✓	

Southeastern Lincoln County HCP	✓	✓			
East Contra Costa County HCP/NCCP	✓	✓			✓
Wisconsin Statewide Karner Blue Butterfly HCP	✓				
WDNR Forest Lands HCP	✓				
Lower Colorado River MSCP	✓				
City of Palm Bay	✓				
Big Pine Key Deer	✓				
Escambia County Beaches				✓	
Indian River/Sebastian Area-wide	✓				
Indian River County Sea Turtle	✓				
Plum Creek Native Fish	✓				
Washington County	✓				
San Bruno Mountain	✓				
Wright Solar Park HCP	✓				
Edwards Aquifer Authority Recovery Implementation Program					✓
Kauai Island Utility Cooperative (KIUC)					✓

IMPACT AND OFFSET QUANTIFICATION

Under Section 10 of the ESA, Habitat Conservation Plans are required to specify the level of take of threatened and endangered species and "the impact which will likely result from such taking."[21] Of the 30 HCPs in our study, the vast majority (28 Plans) quantified anticipated impacts and corresponding offsets.

There were two general approaches across the HCPs studied: Preserve Systems and Species Offset quantification of impacts, or a combination of both. Several Plans used unique models or quantification methods which are also briefly explained.

[21] 16 USC §1539(a)(2)(A)(i).

PRESERVE SYSTEMS

The overarching goal of Preserve System HCP is the establishment of a reserve as habitat for covered species to offset projected impacts due to development. Preserve system HCPs quantify the total acres to be acquired across the term of the HCP to create an "offset" reserve. In addition, many of the preserve systems also include species-specific quantitative goals. 12 of the 30 HCPs in our study aimed to establish a preserve in order to mitigate the impacts of development.

The San Bruno HCP protects most of the mountain area (2,800 of 3600 acres) while allowing landowners to develop about 300 acres. The HCP also required donation by developers of 800 acres to be added to the parkland. As this was the first HCP in the history of the program, it is not surprising that many HCPs that followed used a similar model, setting aside a preserve as habitat for the endangered species they covered.

Another example is the Balcones Canyonlands (BCCP) in Travis County, Texas. This was the first "landscape-level" regional HCP in the history of the program, approved in 1996. This Plan's goal is to assemble a minimum of 30,428 acres of habitat known as the Balcones Canyonlands Preserve (BCP) across 30 years. In this Plan, quantification of the estimated take of habitat is measured using satellite imagery. The BCP protects 8 listed species and 27 other species believed to be at risk.

PRESERVE AND SPECIES OFFSET QUANTIFICATION

In addition to acquiring a target number of acres for a preserve, several preserve system HCPs also included quantitative species conservation targets or maximum take thresholds. The HCPs in our study that aimed to both create a preserve while setting a quantitative species conservation goal were The Charlotte County Capital Improvement Projects HCP, Coachella Valley HCP, the Indian River Scrub-Jay HCP and the Santa Clara Valley HCP.

For example, the Charlotte County Capital Improvement Projects HCP aims to establish a proposed reserve for the Florida scrub-jay as compensatory mitigation while setting a target to increase the baseline population of scrub-jays within the reserve to at least 30 groups by year 15 of implementation, and at least 60 groups by year 30 of the HCP. The Indian River Scrub-Jay HCP establishes a Scrub-Jay Habitat Conservation Area to compensate for the incidental take of up to seven scrub-jay families.

The Coachella Valley HCP aims to create a Reserve System consisting of approximately 723,480 acres (within which Permittees are obliged to conserve approximately 115,140 acres), incorporating habitat modeling for each species, with take assessed quantitatively by comparing the amount of habitat conserved relative to the amount of habitat permitted to be developed. Take tables for each species are included in the HCP which list: total acres of habitat in Plan area, acres authorized for take outside and within conservation areas, acres to be conserved, the percentage of core habitat to be preserved for each species and percentage of potential habitat to be conserved.

The Washington County HCP quantitatively estimates the worst-case take scenario of the endangered desert tortoise based on development of the entire habitat area in addition to establishing a wildlife reserve of 61,022 acres (including 38,787 acres of Mojave Desert tortoise habitat). The Plan acknowledges the uncertainty of predicting the effectiveness of the reserve in terms of tortoise conservation.

The NiSource HCP used statistical habitat models to estimate the number of individuals of each covered species occupying each type of habitat, and then quantified estimated impact in terms of either acres of take or individual species counts.

HABITAT-BASED (NON-PRESERVE)

Several Plans including NiSource, Pima County HCP, Lower Colorado River MSCP, the Clark County MSHCP and the Big Pine Key Deer HCP allow their respective permittees to acquire land as a mitigation offset, but this land is not required to connect to an existing reserve or conservation area. Generally, this is due to the large areal coverage of the HCP, with land acquired in differing locations across the entire HCP coverage area encompassing a single county, entire state or multiple states.

The Big Pine Key Deer HCP has a goal to acquire 500 acres of land but does not direct land parcels to be located close to each other (although it does direct development away from high priority habitat areas). A patchwork approach to land acquisition results in the preservation of fragmented habitat which is arguably not as effective for species conservation as wildlife corridors and connected areas.

The Pima County multi-species HCP is the most recently approved HCP in our study. The Plan aims to mitigate the loss of approximately 36,000 acres of habitat for the 44 covered species. The Plan quantifies impacts by using habitat modelling in consultation with species experts to identify Priority Conservation Areas (PCAs). Habitat suitability for each species was mapped using GIS and represented as "high," "medium," or "low" in terms of habitat suitability for Priority Vulnerable Species. Because modeled habitat is not equally distributed across the County for each species, mitigation will be "appropriately located with respect to habitat such that a minimum equivalency conservation ration of 1:1 (acres of habitat loss: acres of mitigation)" will be achieved.[22]

SPECIES OFFSET QUANTIFICATION ONLY

Another general approach to quantifying anticipated impacts and corresponding offsets focus only on the covered species in terms of total population or maximum take thresholds. For our study, this included the Edwards Aquifer HCP, City of Palm Bay HCP, Indian River County Sea Turtle HCP, and several Plans focused on the endangered Florida Scrub-jay.

For example, the Edwards Aquifer HCP, given the habitat in this case is a watershed and river, quantifies impacts in terms of species take, specifically total numbers of projected individual fish species take authorized by the ITP. Worst-case scenarios are calculated based on modelling pollution events and the effects of invasive species and flooding.

OTHERS

Several Plans used unique models or quantification methods. For example, the Big Pine Key Deer HCP uses a unique method of quantification called the Harvest ratio (H) which is a formula that takes into account both direct habitat loss (acres developed) and human-related deer take (road mortalities and pet kills) to calculate the Harvest value. The total H value for development over 20 years must be limited to a ratio of one to one, while the H-mitigation-to-impact ratio must not be less than a ratio of three to one. Essentially, the HCP allows for limited human development in return for mitigation in the form of conservation land purchases at a rate of three to one. The HCP also includes a land acquisition restoration target of more than 500 acres of high quality habitat to maintain the key deer population and benefit the eastern indigo snake.

The Buckeye Wind/Ever Power HCP in Champaign County, Ohio, calculated acres of mitigation using bat swarming studies data and wind turbine collision models to determine the land area size that

[22] *Pima County Multi Species Conservation Plan*. (2016) (1st ed., p. 49). Tucson. Retrieved from http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Office%20of%20Sustainability%20and%20Conservation/Conservation%20Sciece/Multi-species%20Conservation%20Plan/MSCP_Final_MainDoc_w_Cover.pdf

would need to be protected and enhanced to mitigate for the impact of the take of 130 Indiana bats over the ITP Term.

NO IMPACT AND OFFSET QUANTIFICATION

Of the 30 HCPs studied in our analysis, two did not quantify impacts and offsets: The Kauai Island Utility HCP and the Plum Creek Native Fish HCP. For the Plum Creek Native Fish HCP project, the take analysis was provided in the EIS.[23] In the case of the Kauai Island Utility Cooperative HCP, the Plan acknowledges the difficulty of quantifying the impacts of the numerous threats to any given endangered seabird colony and the success of efforts to mitigate these threats.[24]

TIMING OF REQUIRED COMPENSATION

The timing of the delivery of compensatory mitigation varied across the set of Plans, with some HCPs requiring fees to be paid upfront prior to development impacts, or at least concurrent with the start of development. Other more recent Plans included "stay ahead" provisions requiring upfront mitigation funding to be available, or land to be acquired in advance. Stay ahead provisions generally work best for Plans with discrete and quantifiable conservation actions (e.g. land acquisition and restoration).[25] Several Plans required the establishment of an upfront endowment fund as surety that a pool of mitigation funding would be available in the long-term. In total, exactly half of the Plans in our study (14 Plans) required mitigation in advance of development.

The Orange County Southern Sub-regional HCP requires the up-front establishment of a $10.665 million "non-wasting" endowment fund to pay for the ongoing adaptive management program within the reserve. The Wright Solar Park HCP, currently in draft, also outlines the use of an endowment fund to be used after the construction of the solar energy project for the long-term management (year six and beyond) of the mitigation lands. Assuming a 2.5% capitalization rate. this will need to be $365,200 to provide sufficient capital return on investment to fund management activities.[26]

A successful example of a Plan with "jumpstart" funding to deliver mitigation ahead of impacts was the San Diego Water Authority HCP and its use of conservation banks. The San Diego region has more rare, threatened, and endangered species than any comparable land area in the continental United States, and has been identified as a major hotspot for biodiversity and consequential species endangerment from development.[27] This combination of high biodiversity, large numbers of rare and unique species, and rapid growth and urbanization has led to conflicts between development and conservation. To resolve this conflict and offset its impacts, the Water Authority assembled a Preserve Area system well in advance of the occurrence of impacts. This was through the Plan's use of mitigation banks called Habitat Management Areas (HMAs). A number of the HMAs include habitat acreage credits in excess of current and foreseeable mitigation needs.

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[23] *Final Habitat Conservation Plan Review*. (2006) (1st ed.). Bellevue. Retrieved from http://wdfw.wa.gov/publications/00725/wdfw00725.pdf

[24] *Short-term Seabird HCP Kaua'i Island Utility Cooperative*. (2011) (1st ed., pp. Section 5-3.). Retrieved from http://hawaii.gov/dlnr/chair/meeting/submittals/110225/C-FW-Submittals-C2a.pdf

[25] *Draft Habitat Conservation Planning Handbook*. (2016) (2nd ed., pp. Section 11.3.2.1.). Retrieved from https://www.fws.gov/endangered/esa-library/pdf/HCP_Handbook-Draft.pdf

[26] *Wright Solar Park HCP*. (2014) (1st ed., pp. Section 6-4 and 6-5). Sacramento. Retrieved from https://www.fws.gov/sacramento/outreach/2015/01-13/docs/2014-10-7-Wright%20Solar%20HCP.pdf

[27] Dobson, A. P., Rodriguez, J. P., Roberts, W. M., & Wilcove, D. S. (1997). Geographic distribution of endangered species in the United States. *Science*, *275*(5299), 550-553.; Myers, N., Mittermeier, R. A., Mittermeier, C. G., Da Fonseca, G. A., & Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*, *403*(6772), 853-858.

The Pima County multi-species HCP approved in 2016 for a term of 30 years focused on buying land upfront (before approval of the HCP) to mitigate future costs as land prices were expected to rise. Land and property rights acquired by Pima County since 1999 (as previously agreed by the USFWS), will be credited for use as mitigation lands. The HCP noted the financial incentive for the County to acquire land at a lower value. Additionally, the purchase of large, contiguous blocks of undeveloped land would otherwise have potentially been unavailable in the future because of the projected pace of development in the area.[28]
Several Plans set phased goals for land acquisition. In the case of Pima County, the implementation of land acquisition defined milestones across the term of the project: protection of 49,863 acres of land during Permit Phase I (years 1-10); 53,920 acres during Permit Phase II (years 11-20); and 12,538 acres during Permit Phase III (years 21-30). Three other Plans in our study that defined mitigation land acquisition targets in phases included the Coachella Valley, Lower Colorado, and Western Riverside HCPs.

Several Plans in our study did not set specific land acquisition targets. Rather, the total amount of offsets would be decided based on permit applications and actual development. These are termed "pay as you go" Plans. Examples of these were: WDNR Forest Lands, Charlotte County, Plum Creek, Orange County HCP and the NiSource HCP. In the case of the East Contra Costa HCP. it set a minimum and maximum reserve acquisition target in acres based on high and low development scenarios.

The new Draft HCP Handbook discusses timing of mitigation and the importance of implementing on-the-ground and functional mitigation in advance of impacts. It also notes that if this is not possible, then mitigation should occur concurrently with impacts. If not, "a time lag between the taking and the occurrence of the mitigation often results in additional temporal effects, which may increase the impact of taking and may warrant additional mitigation."[29]

GUIDANCE BY LANDSCAPE-LEVEL PLAN

The USFWS definition of landscape-level conservation defines it as a science-based framework for conserving fish and wildlife that includes "biological planning, conservation design, conservation delivery, outcome-based monitoring, and assumption-driven research."[30] A landscape-level approach is adaptive and should include science-based approaches to solving conservation problems which are implemented incrementally, reviewed regularly, and insights used to determine the steps moving forward.[31]

The draft HCP Handbook, updated in 2016, notes that the program has evolved towards a landscape-level approach for some HCPs because the approach "can provide more opportunities for strategically placing appropriate conservation in an ecosystem context". Further, It continues by

[28] *Pima County MSHCP*. (2016) (1st ed., p. 46). Pima County. Retrieved from http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Office%20of%20Sustainability%20and%20Conservation/Conservation%20Sciece/Multi-species%20Conservation%20Plan/MSCP_Final_MainDoc_w_Cover.pdf

[29] *Draft Habitat Conservation Planning Handbook*. (2016) (2nd ed., pp. Section 9.1.7, pg 9-14.). Retrieved from https://www.fws.gov/endangered/esa-library/pdf/HCP_Handbook-Draft.pdf

[30] *Strategic Landscape Conservation The Right Conservation in the Right Places for America's Fish and Wildlife*. (2008) (1st ed.). Retrieved from https://www.fws.gov/southeast/shc/pdf/landscapeconservationqa-10232008.pdf

[31] Ibid.

noting that landscape-scale or regional- scale plans are encouraged in order to "maximize the conservation value of the HCP."[32]

The Draft HCP Handbook encourages planning to take a landscape-level approach where feasible, although there are tradeoffs to consider. The major advantage of landscape-level plans is that they allow for more proactive and advanced planning of development that is balanced with conservation of threatened species and their habitats. Landscape-level planning tends to be more efficient to develop and manage on a per acre basis, reduces the need to develop, approve, and implement multiple smaller HCPs, and minimizes the workload of the USFWS associated with multiple plan reviews and compliance checks.[33] However, landscape-level plans also have disadvantages. Firstly, they can take many years and millions of dollars to develop. Given the larger size and complexity, landscape-level plans may include multiple covered activities, multiple permittees, and multiple species each with differing habitat and conservation requirements, thus requiring more robust monitoring to account for increased uncertainty over a larger plan area.[33]

The East Contra Costa County HCP delivers compensatory mitigation obligations while being guided by a landscape-level approach. It took seven years to plan at a total cost of $1.8 million. It is 2,125 pages long and its development required over 255 meetings to finalize. It clearly maps out its land acquisition priorities, focused on preserving linkages between existing public lands and wildlife corridors.

As shown in Figure 10, the East Contra Costa County HCP covers 175,000 acres, and aims to create a 30,000-acre Preserve System by acquiring land from private landowners. Land purchases are guided by a map which clearly defines low, medium and high priority acquisition areas, and key restoration priorities. Additionally, proposed development sites are identified in advance, in consideration of existing green space and other land uses.

[32] *Draft Habitat Conservation Planning Handbook*. (2016) (2nd ed., pp. Section 6.1.7, pg 6-2.). Retrieved from https://www.fws.gov/endangered/esa-library/pdf/HCP_Handbook-Draft.pdf

[33] Ibid., (Section 6.1.2, pg 133-134).

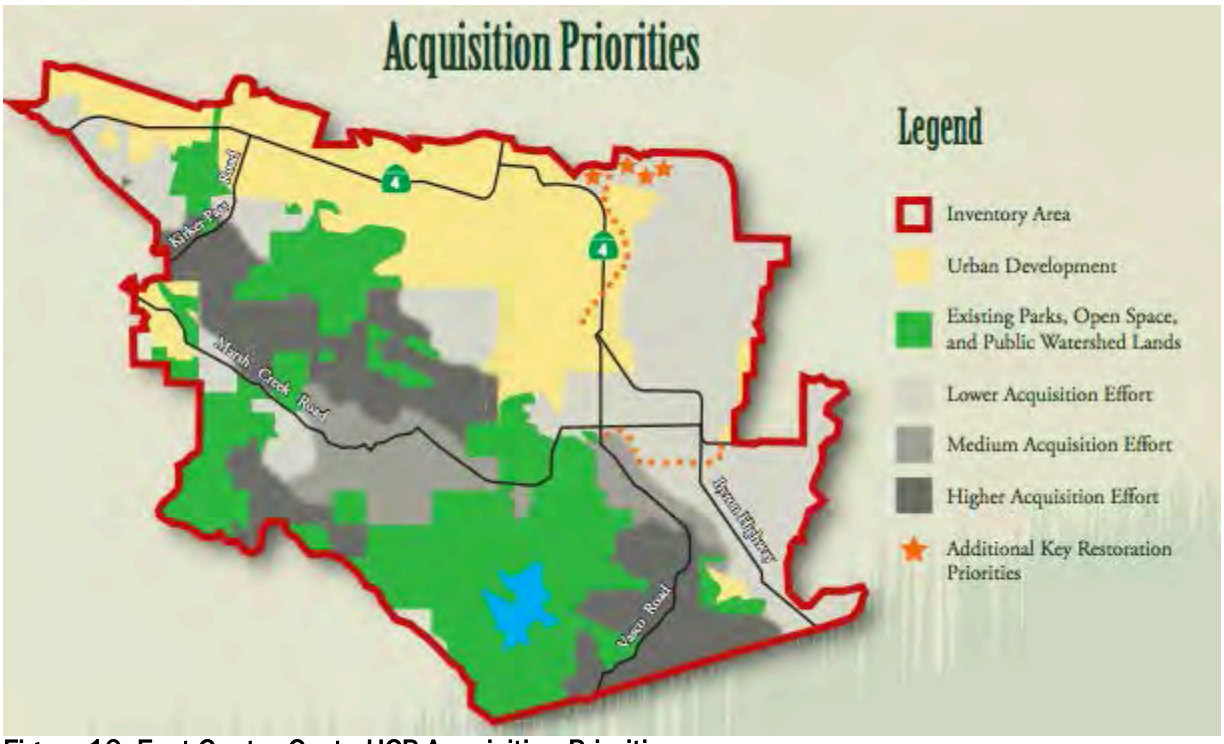


Figure 10: East Contra Costa HCP Acquisition Priorities

Of the 30 Plans in our subset for analysis, 12 plans explicitly stated that the permittees would adopt a landscape-level approach in their conservation efforts. We have also identified 11 Plans that were structured to deliver mitigation at a landscape-level based on the USFWS definition. We identified seven HCPs that did not seem to be guided by a landscape-level approach. These are listed in Table 2 below:

Table 2: Guidance by Landscape-Level Approach for the 30 HCPs

Habitat Conservation Plans that Adopt Landscape-Level Approach		No Evidence of Landscape-Level Approach
Explicitly Stated in Plans	Based on Definition from USWFS	
Coachella Valley Multiple Species HCP	WDNR Forest Lands HCP	City of Palm Bay HCP
East Contra Costa County HCP	Edwards Aquifer Authority Recovery Implementation Program / EARIP	Big Pine Key Deer HCP
NiSource HCP	Lower Colorado River MSCP	Washington County HCP
Wisconsin Statewide Karner Blue Butterfly HCP	Charlotte County Capital Improvement Projects	Fowler Ridge Wind Facility HCP
Balcones Canyonlands Conservation Plan	Indian River County Sea Turtle	Wright Solar Park HCP
Pima County MSHCP	Plum Creek Native Fish	Kauai Island Utility Cooperative HCP*
Escambia County Beaches	Hays County HCP	Clark County Multiple Species HCP**

HCP		
Indian River County Sebastian Statewide HCP	Santa Clara Valley Habitat Plan	
Western Riverside MSHCP	Southeastern Lincoln County HCP	
San Diego Water County NCCP/HCP	San Bruno Mountain HCP	
Buckeye Wind/Ever Power HCP	Orange County Southern Subregion NCCP/HCP	
Midwest Wind Multi-Species HCP		

Notes:

*Although there is no significant evidence that the HCP adopts a landscape-level approach, it was stated in the Plan that the agencies, Kauai Island Utility Cooperative and National Tropical Botanical Garden (NTBG), agree that developing a broad, landscape-level conservation effort in the Upper Limahuli Preserve would produce greater benefits to the species compared to narrowly-focused efforts.[34]

**It was stated in the Plan that Clark County practices ecosystem-level approach which facilitates adaptive management and prioritization of actions that most effectively respond to ecosystem-level and species-specific threats.[35]

Another strong example of an HCP directing the delivery of compensatory mitigation at a landscape-level was the NiSource HCP, explained in detail in the Case Study section of this report. NiSource's coverage area stretches 15,500 miles, crossing three USFWS regions and 14 states. The HCP uses maps to illustrate in advance the location on the pipeline where covered species have the potential to be impacted, with mitigation designed to compensate for the most reasonable worst-case scenario. As such, the mitigation land is located in priority locations across the landscape of the pipeline.

[34] *Short-term Seabird HCP Kaua'i Island Utility Cooperative*. (2011) (1st ed.). Retrieved from http://hawaii.gov/dlnr/chair/meeting/submittals/110225/C-FW-Submittals-C2a.pdf.

[35] *Clark County Multiple Species Habitat Conservation Plan and Environmental Impact Statement for Issuance of a Permit to Allow Incidental Take of 79 Species in Clark County, Nevada* (2000) (1st. ed) Retrieved from http://www.clarkcountynv.gov/airquality/dcp/Documents/Library/current%20HCP/ccfeis.pdf

CASE STUDIES

We selected four HCPs to depict as case studies:

- Buckeye Wind Project
- Indian River County/Sebastian Area-Wide HCP
- NiSource, and
- Lower Colorado River Multi-Species Conservation Plan

The four Plans illustrate a diversity of approaches in response to different development pressures and the unique habitat requirements of individual species. The Buckeye Wind Power Plan is a new HCP, with construction set to begin in 2018. The goal of the Plan is to accelerate renewable energy development in Ohio by constructing wind turbines across six townships. This plan was selected because it highlights the growing importance of renewable energy projects in the United States. It demonstrates a comprehensive and inclusive approach towards species conservation by outlining key biological objectives to reduce negative externalities on the Indiana bat. Since the Plan is set to begin after the changes to the 2016 Federal Mitigation Policy is in place, this Plan is a good example of how developers for future renewable energy projects should structure their HCPs.

The Indian River/Sebastian Area-wide HCP was approved in 2000 and was a plan for which a progress report was unavailable online. To understand progress to date, we contacted Indian River County Lands Manager, Beth Powell, who emailed copies of the most recent progress reports and provided additional detail in subsequent conversations. Despite the gaps in the design of the HCP, such as lack of adaptive management techniques and no detailed budget of planned compensatory mitigation, Beth Powell was able to give us direct on-the-ground feedback that the Plan has been successful in restoring the scrub-jay population and their habitat. She said that the Plan has "gone above and beyond" the requirements of the HCP, by undertaking additional species-focused conservation activities including banding the scrub-jays to track their location and also monitoring to ensure the scrub-jays were successfully breeding and fledging. In the case of the Indian Rivers/Sebastian Area-wide HCP, it is the dedication and commitment of local County staff that have enabled it to succeeded despite weaknesses in the Plan itself.

The NiSource HCP is the most ambitious Plan in the history of the HCP program. It was developed to permit the maintenance of the pipeline which crosses through 14 states. It is a model example of the efficiencies inherent in a landscape-level approach to mitigation. This single HCP permit issued for a period of 50 years allows mitigation funding to be pooled for larger conservation projects and replaces the prior process of up to 100 permits being issued each year in order for the pipeline company to conduct site-specific maintenance work.

The Lower Colorado River Multi-Species Habitat Conservation Plan demonstrates an integrative approach that engages multiple stakeholders to drive conservation efforts across California, Arizona, and Nevada in anticipation of development of hydroelectricity generation, and to ensure long term protection of drinking water and recreational activities throughout the region.

CASE STUDY: BUCKEYE WIND ENERGY

AT A GLANCE

Location: Champaign, Ohio

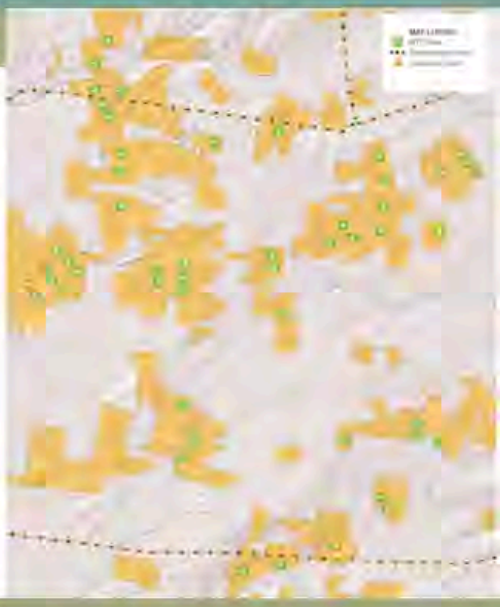
Size: 217 Acres

Covered Species: 1

Permit Issued: 07/18/2013

Duration: 30 Years

Habitat Type: Rural
- 90% agricultural
- 10% forested areas



PLAN OVERVIEW

GOALS & OBJECTIVES

The Buckeye Wind LLC is developing a large-scale wind energy site in Champaign County, Ohio. The total project area encompasses 6 townships in Champaign, Ohio a total of 80,051 acres but the total area set aside for compensatory mitigation is 217 acres. The goal of this project is to produce enough energy to power 31,000 homes yearly and reduce overall CO2 emission in the region. The biological objective set out by the Buckeye Habitat Conservation Plan is to minimize the take of the Indiana bat and maximize the health and viability of the Indiana bat population.

This strategy will ensure that no more than 26 bats are killed over any 5-year period. Purchase 217 acres of easement acquisition to permanently restore the Indiana bat's habitat or purchase credits from an approved Indiana bat mitigation bank.

APPROACHES TO CONSERVATION & MITIGATION

PARTNERSHIPS & FUNDING SOURCES: EVERPOWER WIND HOLDINGS & BUCKEYE WIND FULLY OWNS THE PROJECT AND OTHER PARTIES MENTIONED (i.e. CHAMPAIGN WIND LLC) ARE SUBSIDIARIES OF EVERPOWER HOLDINGS. OVERSIGHT ACROSS THE PLAN IMPLEMENTATION IS BUCKEYE POWER LLC AND ITS SUBSIDIARIES.

IMPLEMENTATION METHOD

- **Mitigation Measures:** The mitigation measures include mitigating for the incidental take of 130 bats over the 30-year project lifespan and/or the preservation of 210 acres of Indiana bat habitat. The mitigation measures that will be potentially utilized include (1) acquiring lands suitable for Indiana bat, (2) restore travel corridors in easement areas, (3) enhance protected land areas by planting suitable roost trees and managing invasive species, (4) purchasing credits for an approved Indiana bat mitigation bank in the same geographical range of the project
- **Avoidance Measures:** The avoidance measures described in the Buckeye Plan include the following but are not limited to these selected avoidance measures. The avoidance measures that will occur during decommissioning include installation of silt fencing between wetlands and construction project to avoid damage. Prior to development initial research was conducted to select areas with fragmented landscapes rather than contiguous forest lands and protected habitats to reduce risk to the Indiana bat. The turbines will not be closer than 1.8 miles to roost trees, a critical habitat for the Indiana bat.
- **Minimization Measures:** The minimization measures described are limiting acres of tree removal, reduce size of cleared forest patches, and replant trees in areas deemed appropriate.

CASE STUDY: BUCKEYE WIND ENERGY (Continued)


Indiana Bat

COMPENSATORY MITIGATION

Amount of Compensation: The total project cost of 11.7 million will be to acquire 217.04 acres of land and create permanent preservation of suitable land for the Indiana bat. This would fulfill the second object of this habitat conservation plan if incidental take exceeds plan's expectations.

Funding Assurances: The Buckeye Wind plan will dedicate a portion of funds to compensate for the take of the Indiana Bat through a third-party conservation bank approved by the USFWS.

MONITORING, REPORTING, AND ADAPTIVE MANAGEMENT

Monitoring	Reporting	Adaptive Management
✓	✓	✓

GUIDANCE BY LANDSCAPE LEVEL PLAN

Biological Planning	Conservation Design	Conservation Delivery	Outcome-based monitoring	Assumption-driven research
✓	✓	✓	✓	✓

ANALYSIS

The Buckeye Wind Project recognizes the threats that climate change presents therefore this plan takes a comprehensive approach to habitat conservation planning. The projected completion date for this project is in 2018. This plan is considered a strong HCP because it aligns closely with the updates to the Federal Mitigation Policy. This policy discusses changes to U.S population, land use, and climatic changes, which heightens the need for better conservation policies. The Buckeye Wind Project explicitly addresses the landscape level context. A stronger component of this plan is the focus on biological objectives the federal policy suggests should be considered to make beneficial conservation actions. This plan also has a comprehensive look on when mitigation will be delivered and explicitly details where funding will go.

References:

- Indiana Bat: https://www.fws.gov/Midwest/endangered/images/mammals/inba/inbaMYS02009CoonByUSFWSAndrewKing300px.jpghttps://www.fws.gov/Midwest/endangered/images/mammals/inba/inbaMYS02009CoonByUSFWSAndrewKing300px.jpg
- Project Map: https://www.fws.gov/Midwest/endangered/images/hcp/BuckeyeHCPActionAreaMap300px.jpg
- Project Fact Sheet: http://everpower.wpengine.com/wp-

CASE STUDY: SEBASTIAN AREA-WIDE FLORIDA SCRUB JAY

AT A GLANCE

Location: City of Sebastian, Florida (Indian River County)

Size: 330.5 acres

Covered Species: 1

Permit Issued: 9/19/2000

Duration: 30 Years

Habitat Type: *oak scrub, scrubby flatwoods, and mesic matrix habitat types*


Scrub Jay

PLAN OVERVIEW

GOALS & OBJECTIVES

The goal of the Sebastian Area-wide Florida Scrub-jay HCP is to resolve conflict between the conservation of the Florida Scrub-jays, a federally-listed threatened species, and residential development within Florida Scrub-jay habitat located in the City of Sebastian's 14,000 ± lot Sebastian Highlands platted residential development. The proposed action is the clearing of potential Florida Scrub-jay habitat for construction of single-family residential homes located within the Sebastian Highlands subdivision. All residential lots within the Sebastian Highlands subdivision that contain potential Florida Scrub-jay habitat located along the Atlantic Coastal Ridge are covered under this HCP. The Indian River County Board of Commissioners (IRC Board) and the City of Sebastian (referred to as the "Applicants") are the lead agencies for the implementation of the HCP and have initiated this conservation effort with cooperation from the School Board of Indian River County. Issuance of an ITP by the FWS allows the incidental take of the Florida Scrub-jay for a 30-year period that would occur due to the lawful activity of constructing single-family residential homes within the platted residential areas of the Sebastian Highlands Subdivision. The ITP would also cover future take on 88.1 ± acres of commercial property on Sebastian Airport and 4 acres within the Pelican Island Elementary School boundary. To compensate for the taking of 79.3 ± acres of habitat that the FWS identified as being either occupied or potentially occupied by scrub-jays, the Sebastian HCP proposes a combination of compensatory mitigation measures for compliance with the conservations requirements of Section 10(a)(2) of ESA. These include:

1. Conservation, restoration and management in perpetuity of optimal Florida Scrub-jay habitat in the specified 330.5 ± acres referred to as the Scrub-jay Habitat Conservation Areas.
2. Enhancement of scrub-jay dispersal opportunities on the Sebastian Airport through conservation and management of an existing hedgerow.
3. Ensuring that the City of Sebastian abandons its plans to extend Gibson Street through core scrub habitat areas in the North Sebastian Conservation Area.

APPROACHES TO CONSERVATION & MITIGATION

PARTNERSHIPS & FUNDING SOURCES Three primary funding sources have been identified to support implementation of the proposed Sebastian HCP operating conservation program. Indian River County is the entity responsible for implementation of the mitigation measures set forth in the HCP.

1. Proceeds collected from selling timber that is to be cleared from the Scrub-jay Habitat Compensation Areas to support scrub-jay habitat restoration.
2. Funds from from the Indian River County Environmental Lands Acquisition bond program. The proceeds from selling timber and this bond program will be used to pay for the mechanical treatments to initiate optimal habitat for the scrub-jays and the restoration burning activities.
3. The Indian River Mitigation Fund Account for upland and wetland restoration projects will be used to support long-term habitat management actions on the conservation areas.

CASE STUDY: SEBASTIAN AREA-WIDE FLORIDA SCRUB JAY

COMPENSATORY MITIGATION

AMOUNT OF COMPENSATION: Annual O&M and Overall project cost: Does not specify overall project cost nor any specific dollar amount of funding. Indian River County did not pay compensation, rather the HCP outlined the objectives and the criteria that had to be met within the specified areas.

TIMING OF REQUIRED COMPENSATION: Phase one of compensatory mitigation in the form of restoring optimal habitat for scrub-jays through logging timber and removing exotic species in the Habitat Conservation Areas will occur within one year from issuance date of Sebastian HCP ITP. Restoration burning will be either "Immediate" (within 1 year from issuance date of HCP ITP. Total acres = 292.8 acres); or "Short-term" (within 2 to 5 years from issuance date of HCP ITP. Total acres = 353 acres).

IMPACT & OFFSET QUANTIFICATION: The HCP establishes 330.5 ± acres referred to as the Scrub-jay Habitat Conservation Areas as areas for compensatory mitigation for the incidental take of up to seven families of scrub-jays located in the Sebastian Highlands platted residential development. The permanent restoration, management and preservation of the Habitat Conservation Areas for scrub-jays will assist in the persistence of their presence in the area.

IMPLEMENTATION METHODS

1. **Mitigation measures:**-To mitigate potential impacts of the taking of scrub-jays, restoration and long-term management of optimal Florida scrub-jay habitat conditions within the 330.5 ± acres Scrub-Jay Habitat Compensation areas will be implemented for the duration of the Incidental Take Permit (30 years).
2. **Avoidance measures:** N/A
3. **Minimization measures:** The minimization measures described are initiate habitat restoration treatments, mechanical and burning within the conservation areas; use of a logging contractor for tree removal for habitat restoration and monitoring soil disturbances from logging action; use of existing jeep trails, historic fire breaks, and disturbed habitat as routes to go in and remove out harvested logs from each conservation site; use of rubber tired heavy equipment for all mechanical treatment activities to minimize soil disturbance; use of soft fire breaks as control lines wherever feasible; performance of field surveys in scrub-jay territories during nesting season to locate active nests before any management activity is applied.

MONITORING, REPORTING, AND ADAPTIVE MANAGEMENT

Monitoring	Reporting	Adaptive Management
✓	✓	✓

Adaptive management was not included in this HCP, but Indian River County Conservation Lands Manager Beth Powell explained they are in the process of reevaluating their reporting to include adaptive management techniques.

GUIDANCE BY LANDSCAPE LEVEL PLAN

Biological Planning	Conservation Design	Conservation Delivery	Outcome-based monitoring	Assumption-driven research
✓	✓	✓	✓	✓

ANALYSIS

This HCP does not seem to not be as comprehensive as newer HCPs, as it does not include adaptive management techniques or a budget. However, Indian River County is currently working on including techniques and modifying the reporting criteria for the HCP. They also are conducting more monitoring than what was originally required and outlined in the HCP by banding the scrub-jays to track their location and see if they are breeding and fledging. It seems that the success of the HCP in restoring scrub-jay habitat and supporting the scrub-jay population is due to the successful partnerships and entities involved in the HCP process. Indian River County Conservation Lands Manager Beth Powell explained that the FWS was instrumental in moving their HCP forward successfully. Since the HCP did not set out concrete funding in dollar amounts, but rather had specified acreage for land conservation and management, we were unable to report on how compensatory mitigation funding had been used. However, according to the 2007-2011 Annual Report, land management occurring within the Management Units as established in the March 2000 Sebastian Area-Wide Florida Scrub-jay Habitat Conservation Plan, show successful natal budding, immigration and long-term site fidelity. 2011 was proven to be successful in terms of corresponding habitat management activities and scrub-jay recruitment and fledging success.

CASE STUDY: NISOURCE

AT A GLANCE

Location: Delaware, Indiana, Kentucky, Louisiana, Maryland, Mississippi, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia

Size: 9,783,207 acres

Covered Species: 43

Permit Issued: 9/13/2013

Duration: 50 Years

Habitat Type: Multiple

PLAN OVERVIEW

GOALS & OBJECTIVES

A Wall Street Journal article in 2010 called the NiSource HCP "one of the most ambitious environmental agreements in U.S. history." The HCP is one of the most far-reaching in scope of any HCP to date in the program. This Plan permits the overhaul and maintenance of a natural-gas pipeline owned and operated by NiSource Inc. The pipeline stretches over 15,500 miles while crossing 3 USFWS regions, 14 States and crossing paths with 42 endangered and threatened species along the way. The total area covered by the HCP is over 9.7 million acres of which only a small percentage will be impacted annually.

Prior to the MSHCP, NiSource was filing permit requests project by project in 14 different states, coordinating with agencies and many jurisdictions. The company estimated it was filing around 90 permits a year with various state and federal wildlife agencies. NiSource contacted the USFWS in 2005 to discuss a more efficient approach. The result was the development of a Multi-Species Habitat Conservation Plan (MSHCP). Approved in 2013, the MSCHP allowed both NiSource and state and federal agencies to streamline pipeline maintenance and upgrades more efficiently, essentially granted a 50-year permit for development within a single plan.

In summary, the MSHCP provides a means to avoid, minimize and mitigate for take of species caused by pipeline operations and maintenance activities through compliance, rigorous planning, adaptive management and a landscape approach. The company chose to adopt a landscape-level approach in order to accomplish species recovery by addressing the needs of species and their habitats on a regional and ecosystem-wide basis.

APPROACHES TO CONSERVATION & MITIGATION

PARTNERSHIPS & FUNDING SOURCES: NiSource's projects are fully financed using cash on hand or corporate bonds and then are reimbursed by NiSource's natural gas customers. All MSHCP costs will be assured through a NiSource's corporate credit facility, and if it becomes necessary, through a Service-approved letter of credit. Oversight is the Bloomington Ecological Services Field Office. HCP includes a Reserve Account with a minimum amount of $100,000 in case the Primary fund is overdrawn or for emergencies. Other funding insurances include a Credit Facility or Letter of Credit.

CASE STUDY: NISOURCE

COMPENSATORY MITIGATION

CONSERVATION OBJECTIVES: The HCP focuses on species-level impacts across the pipeline area. This is outlined in the Plan using maps to illustrate where along the pipeline of planned activities particularly species could be impacted, with mitigation designed to compensate for the reasonable worst case scenario. Statistical habitat models were used to identify acreage of suitable habitat and, in some cases, estimate the number of individuals potentially occupying this suitable habitat within the covered lands. The estimated take over the full 50-year term of the plan is quantified in terms of either acres of take, or individual species counts. For example, the HCP establishes that the estimated incidental take of Madison Cave Isopod habitat totals 2,764.5 surface acres of habitat, and for the American burying beetle an estimated 4 individuals (as just two examples of species-level quantification of take outlined in the multispecies plan).

Compensatory mitigation is divided into two parts: Operations and Maintenance (O&M) and Project-specific. For the first seven years, NiSource will fund $799,595 for O&M, while the overall project cost for the lifetime of the HCP will cost a projected $40,212,346. Mitigation measures may be carried out either in advance of impacts which will be considered as a credit toward future impacts or may occur as they arise following impacts to listed species. Responsible permittees have the option to deposit compensatory amounts that commensurate with the anticipated take and mitigation debt into the Mitigation Account of the trust fund prior to construction. NiSource plans to pay the costs of mitigation within the first 7 years.

IMPLEMENTATION METHODS

1. **Minimization & Avoidance Measures**
    - Pre-Construction Project Planning
    - Performance-based instructional training system
    - Environmental Construction Standards (ECS),

2. **Mitigation:**
    - Green infrastructure assessment for strategic conservation planning
    - Permanent protection of existing habitat through fee acquisition, conservation easements or other legal instruments (may include both NiSource-owned lands and lands owned by others);
    - Enhancement and restoration of habitat;
    - Management of habitat to achieve and/or maintain specific biological characteristics; and
    - Species propagation and reintroductions.

IMPACT & OFFSET QUANTIFICATION: The NiSource MSHCP encompasses a total of 9,783,207 acres, which is based on the one-mile corridor rationale across 17,000 miles of pipeline, therefore including 95% of annual projects (approximately 400 projects).

CASE STUDY: LOWER COLORADO RIVER MULTI SPECIES CONSERVATION PLAN

AT A GLANCE

Location: Colorado River: Arizona, California, Nevada

Size: 400 miles

Covered Species: 26

Permit Issued: 2004

Duration: 50 Years

Habitat Type:

- Cottonwood Willow
- Honey Mesquite
- Marsh
- Backwaters

PLAN OVERVIEW

GOALS & OBJECTIVES

The Lower Colorado River Multi-Species Habitat Conservation Plan (MSCP) was created in 2005 with the intention to balance the use of Colorado River water resources and the conservation of native species and their habitats. The plan aims to focus on the recovery of species listed by the Endangered Species Act, particularly to reduce the likelihood of additional species listed. The problem the Multi-Species Habitat Conservation Plan aims to address is the value the Colorado River serves as a source of hydroelectric generation, water and recreational activities. Currently, The Colorado River provides the water supply for over 25 million people and about 3.5 million acres of agricultural lands in the United States and Mexico. However, increased development along the Colorado River places habitats and species at risk. The primary driver of the Lower Colorado MSHCP (LCR MSCP) is the potential growth of hydroelectric generation facilities on the Colorado River. Collectively, the Colorado River has the potential to generate 12 billion kilowatts of hydroelectric power annually. The LCR MSCP is the first step to ensure comprehensive conservation measures are implemented prior to renewable energy development, as well as ensure protection of water resources and recreation.

STAKEHOLDERS: The Bureau of Reclamation is the lead implementing agency for the LCR MSCP, however many individual projects are accomplished through partnerships, especially with state and federal land management or natural resource agencies. Although the Bureau of Reclamation is the primary implementing agency, a Steering Committee is comprised of fifty-seven entities including state and federal agencies, water and power users, municipalities, Native American Tribes, conservation organizations, other interested parties, who are responsible for providing input on the plan development and implementation.

APPROACHES TO CONSERVATION & MITIGATION

PARTNERSHIPS & FUNDING SOURCES: Program costs are evenly divided between the Federal government and non-federal partners: 50% is covered by the three states (AZ, CA, Nevada) and 50% by Federal Bureau of Reclamation

CONSERVATION OBJECTIVES

- Native fish population augmentation
- Research and monitoring of species habitats
- Creation and long term management of new habitats
- Adaptive management

CASE STUDY: LOWER COLORADO RIVER MULTI SPECIES CONSERVATION PLAN

COMPENSATORY MITIGATION

COMPENSATION: The total amount of compensation delivered by the plan is $626,180,000 to be delivered over the course of the fifty-year conservation plan. The compensation strategy is to allocate funds in five year increments and track the amount provided by each state on an annual basis across Arizona, California, and Nevada, and federal funds. In addition to the monetary compensation, the plan focuses on habitat creation through the protection and establishment of 8,132 acres. The Conservation Plan provides for the creation of acres by habitat types:

- 5,940 Acres of Cottonwood Willow land cover designed to manage and replace greater habitat value for covered species than the existing 2,132 acres of cottonwood-willow land cover affected by covered activities
- 1,320 Acres of Honey Mesquite Land Cover designated to provide greater habitat value for associated covered species
- 512 Acres of Marsh land cover to provide greater habitat value
- 260 Acres of Backwaters to provide greater habitat value for associated covered species affected by covered activities

TIMING OF REQUIRED COMPENSATION: The applicants intend to implement LCR MSCP conservation measures as quickly as possible, reliant on efficient staffing, funding and research necessary to evaluate and acquire land for covered species. It is anticipated that the first few years of implementation will require research and experimental measures to collect information that will be necessary to effectively implement the MSCP. Following the collection of this information, it is expected that implementation will rapidly increase with most if not all habitat creation completed within the first 20-30 years of approval. It is presumed that during implementation Years 0–5, most habitat creation projects will be small in scale and designed to identify and verify the most cost effective means of creating high quality habitat. Larger scale projects would be implemented in Years 6–10 that are designed based on information gathered from previous plantings

MONITORING, REPORTING, AND ADAPTIVE MANAGEMENT

Monitoring	Reporting	Adaptive Management
✓	✓	✓

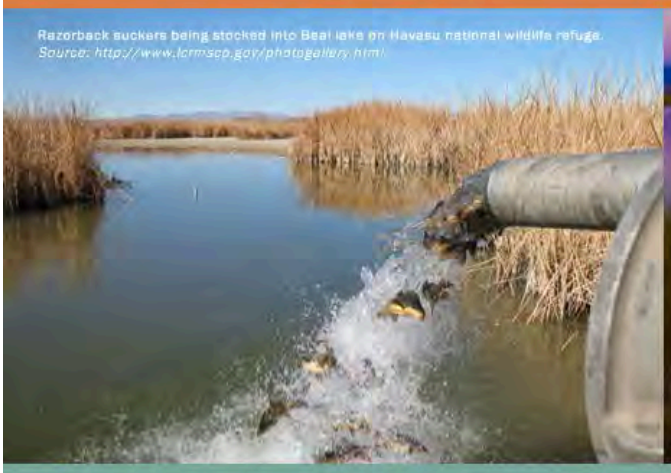
The plan outlines a robust monitoring, reporting, and adaptive management strategy to be implemented throughout the course of the 50-year plan. The implementation will align with the USFWS Five Point Policy which includes monitoring and research to adaptively manage the implementation of conservation and mitigation strategies.

GUIDANCE BY LANDSCAPE LEVEL PLAN

Biological Planning	Conservation Design	Conservation Delivery	Outcome-based monitoring	Assumption-driven research
✓	✓	✓	✓	✓

Although the Lower Colorado MSCP does not explicitly state that is a landscape level plan, it is comprised of many characteristics that align with the landscape level definition. Landscape level plans have been defined as those that include a science based framework for conservation that includes biological planning, conservation design, conservation delivery, outcome based monitoring and assumption driven research. The Lower Colorado MSCP includes a habitat based approach that aim to avoid, minimize, and fully mitigate impacts on all covered species and their habitat, a conservation strategy based on scientific research, and establishes a set of measurable biological goals to foster habitat creation and drive the augmentation of populations and to ultimately mitigate all of the potential impacts listed within the plan. Finally, the plan includes outcome based monitoring to ensure the objectives of the plan are being achieved through the development of annual progress reports to develop and integrate adaptive management strategies. Overall, the LCR MSCP provides a comprehensive and integrated approach to conservation that aligns with the landscape level approach.

CASE STUDY: LOWER COLORADO RIVER MULTI SPECIES CONSERVATION PLAN



Razorback suckers being stocked into Beal lake on Havasu national wildlife refuge.
Source: http://www.lcrmscp.gov/photogallery.html

BEAL LAKE CONSERVATION AREA

ANALYSIS

The Lower Colorado Multi-Species Conservation Plan represents a comprehensive and integrated approach to developing, implementing, and monitoring habitats and species in anticipation of hydroelectric energy generation, and emphasizes the importance of preserving water and recreational activities across California, Arizona, and Nevada. The plan identifies and engages critical stakeholders throughout the process and demonstrates an exemplary approach and framework to develop and implement multi-species habitat conservation plans.

PHASE 3: QUANTIFYING THE DELIVERY OF COMPENSATORY MITIGATION UNDER HCPS

After a HCP has been approved, the next step is implementation. The Permittees must report annually to the USFWS to outline how the Plan is in compliance, and according to the draft HCP Handbook, this must include details of: Avoidance, minimization and mitigation measures that occurred within the reporting period; other specific reporting measures outlined in the HCP; and progress towards biological goals and objectives.[36] The USFWS does not currently track HCP progress information in the ECOS database. As a result, it can be difficult to locate information on the amount of compensation delivered after the implementation of approved Plans given the lack of a centralized repository for progress reports. In some cases, where progress reports are not available online, they can only be obtained by calling the Permittee and finding the correct contact who understands what the HCP is, and where to locate the progress reports. This can take several emails and/or calls to County offices, County biologists, the developing utility, consultants or other contacts involved in the HCP drafting or implementation.

In order to understand the compensation delivered to date for our set of 30 HCPs, we collected data from annual progress reports to compare the amount of compensation delivered versus what was outlined in the original HCP. Out of the selected 30 HCPs, we were able to locate progress reports for 22 HCPs, equivalent to 73% of the Plans in our study.

1. Balcones Canyonlands (BCCP)
2. Big Pine Key Deer
3. City of Palm Bay
4. Clark County Multiple Species HCP
5. Coachella Valley Multi-Species HCP
6. East Contra Costa County HCP/NCCP
7. Edwards Aquifer Authority Recovery Implementation Program/EARIP
8. Escambia County Beaches
9. Indian River County Sea Turtle
10. Indian River/Sebastian Area-wide
11. Kauai Island Utility Cooperative (KIUC)
12. Lower Colorado River MSCP
13. NiSource MSHCP
14. Orange County Southern Subregion NCCP/HCP
15. Pima County Multi-Species Conservation Plan, under Sonoran Desert Conservation Plan
16. San Bruno Mountain
17. San Diego County Water Authority Subregional NCCP/HCP
18. Santa Clara Valley
19. Southeastern Lincoln County HCP
20. Washington County
21. Western Riverside MSHCP
22. Wisconsin Statewide Karner Blue Butterfly Habitat Conservation Plan

Eight Plans were not included in our analysis due to the following reasons:

- Three had not started implementation and therefore progress reports were not yet available: Buckeye Wind/Ever Power HCP, Midwest Wind Multi-Species HCP, and Wright Solar Park HCP.

[36] *Draft Habitat Conservation Planning Handbook*. (2016) (2nd ed., pp. 10-12). Retrieved from https://www.fws.gov/endangered/esa-library/pdf/HCP_Handbook-Draft.pdf

- Two Plans do not include a compensatory mitigation mechanism: Plum Creek Native Fish and WDNR Forest Lands HCP.
- Fowler Ridge Wind Farm had published a progress report but the delivery of compensation had not yet begun.
- There were two Plans for which we were unable to obtain progress reports: Hays County Regional HCP and Charlotte County Capital Improvement Projects HCP.

A completed table with information listing planned and delivered compensation for the set of 30 HCPs we analyzed in this study can be found in Appendix B.[37]

COMPENSATORY MITIGATION DELIVERED TO DATE

In order to calculate the total amount and type of compensatory mitigation delivered to date under our set of 30 HCPs, we first identified the overall HCP budget in the Plan, if it was available. We then defined two broad compensation categories under which to classify and quantify mitigation:

- Habitat-based compensation included all funding and activities related to the purchase, protection, quantified in dollars, and/or the creation or restoration of habitat for covered species, quantified in acres.
- Non-habitat based compensation was categorized as administration or operations, monitoring, research, species management, outreach, education, and other.

After collating the information from the 22 HCPs, the total estimated amount of funds to be delivered as compensatory mitigation throughout the full term of the Plans totaled $6,332,384,960. According to our analysis, a total of $988,350,180 or approximately 16% of the total, has been allocated to mitigation activities including habitat-based mitigation as well as non-habitat based mitigation (a breakdown of the funds delivered to date compared with the planned funds can be found in Figure 11).

Although not all Plans allocate funds for land acquisition, it was useful to compare planned land acquisition versus land purchased to date according to their progress reports (Figure 12). Out of the 22 Plans analyzed, 17 Plans had clear targets for land acquisition as a form of compensation. In total, the 17 Plans aimed to purchase 574,379 acres of land. To date, according to the most recent progress reports available, 13 Plans have already acquired a total of 329,565 acres of land, representing 59% of the total acreage acquisition target.

[37] This data is also available in the accompanying Excel database of findings, tab "Delivered CM (Task 3)"

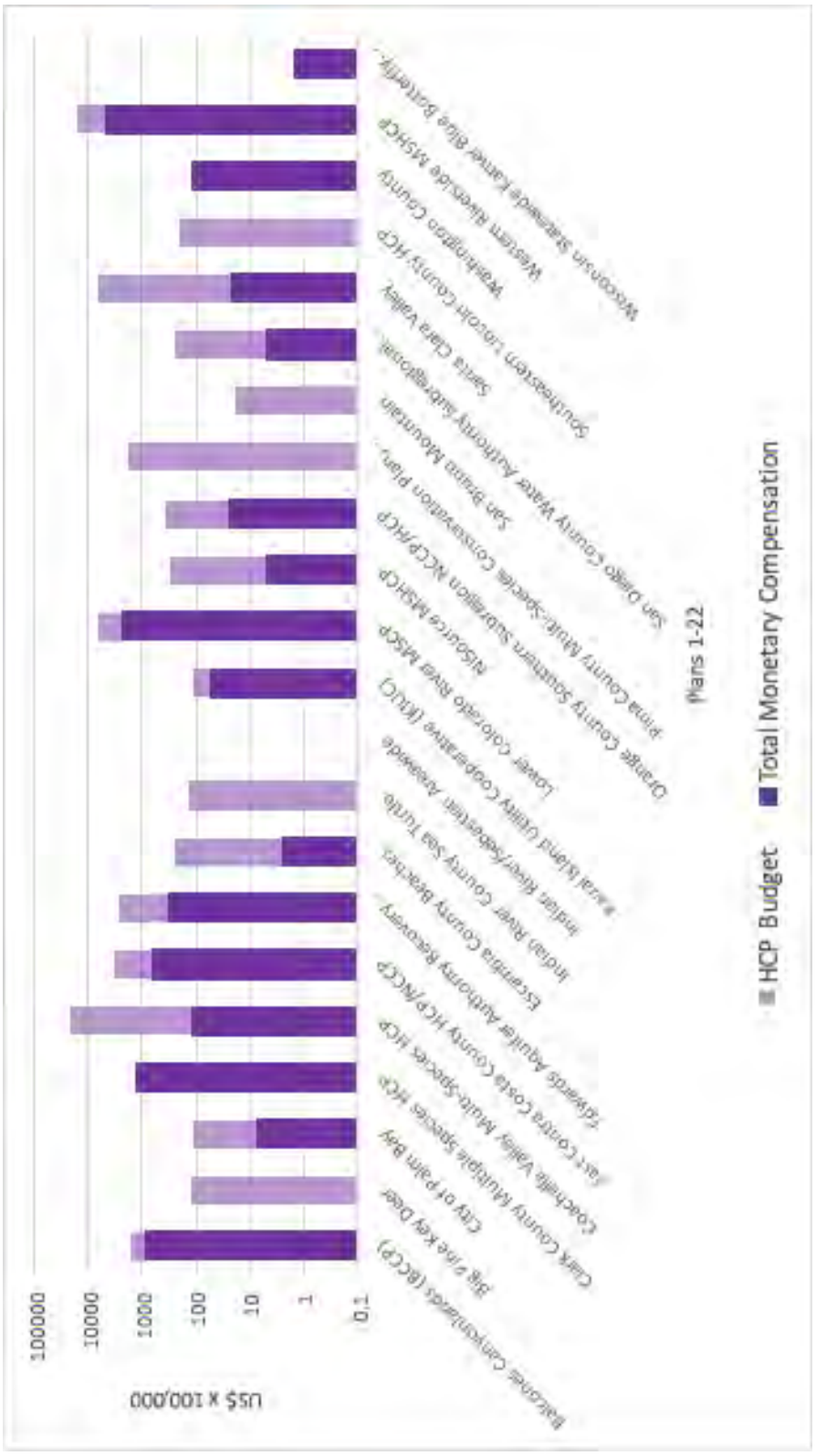


Figure 11: Total Monetary Compensation versus Expected Compensation by HCP budget.

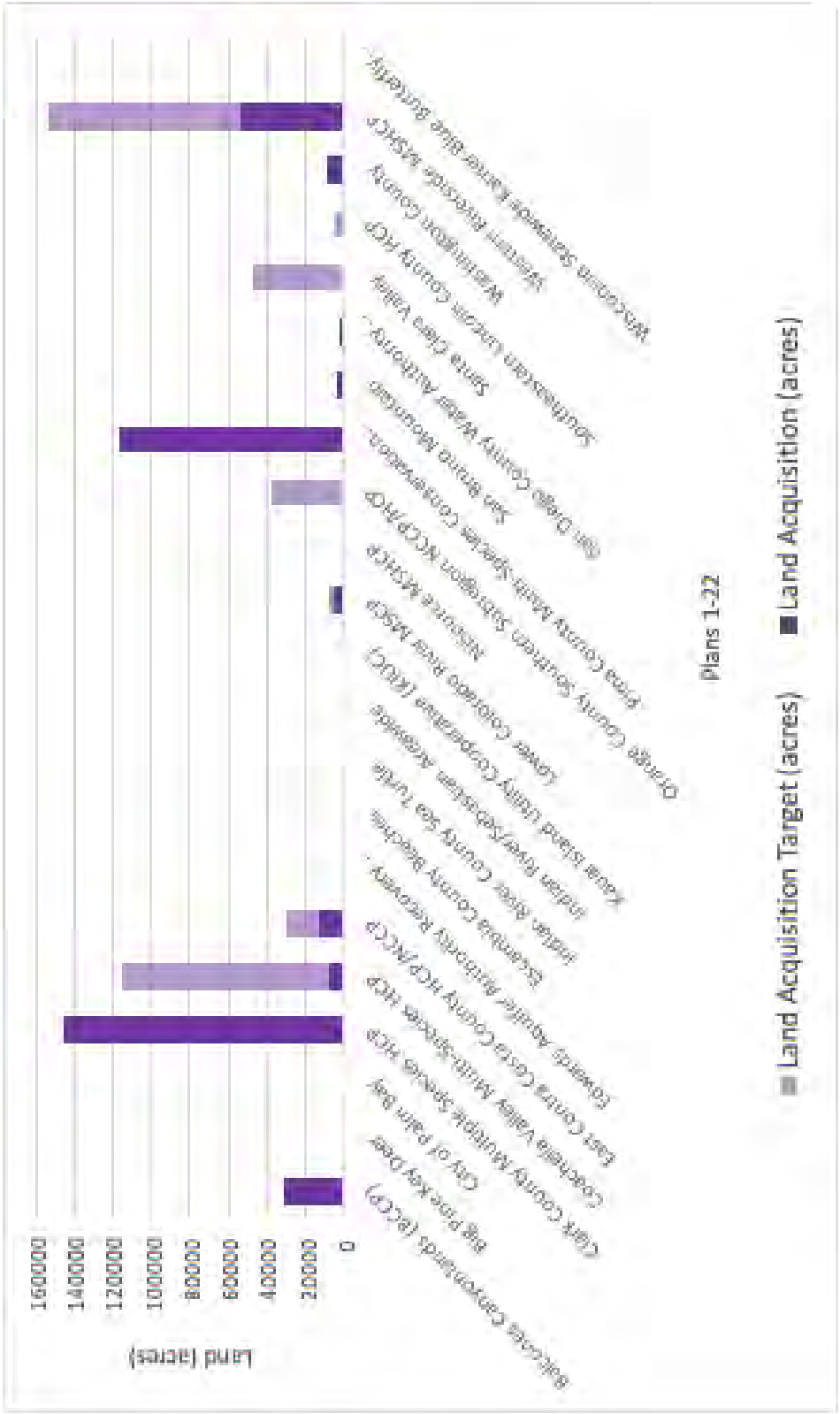


Figure 12: Land Acquisition Target versus Land Acquired to Date

COMPENSATORY MITIGATION DELIVERED IN ADVANCE OF DEVELOPMENT

As discussed in Section 4.2.4 of this report, the timing of the delivery of compensatory mitigation varied across Plans. Some HCPs required compensatory mitigation funding to be paid prior to development. Other more recent Plans included "stay ahead" provisions that required upfront mitigation funding to be available, or land to be acquired in advance. Out of the 22 Plans reviewed, 11 required payment in advance of development. Progress reports indicated that seven of the 11 projects had paid compensation prior to development. We could not find information for the remaining four.

However, payments of fees in advance does not necessarily mean that mitigation action is being carried out in advance of impacts. For example, after the City of Palm Bay HCP was approved in 2007, payment of an upfront $656,000 was made to the designated expert for implementation of mitigation projects (TNC Florida). However, we could not obtain progress report details to determine how this funding was spent and directed towards compensatory mitigation in the form of either habitat acquisition or enhancement for the Florida scrub-jay. It is inconclusive if scrub-jay habitat was acquired by TNC Florida or if other mitigation projects were delivered in advance of impacts. Annual reports for the Plan only detail payments to the third party tasked with implementing the mitigation with no apparent oversight in terms of the delivery of offsets (in particular. if new habitat was acquired for the scrub-jay).

The Midwest Wind Energy HCP addresses the issue of monitoring mitigation implemented by third parties by specifically including this as an obligation within the HCP.[38] The third party must be under contract to maintain records that at a minimum include: The location and description of each mitigation site, the entity responsible for managing and maintaining each mitigation site, the level of anticipated take for each mitigation site if applicable, and results of mitigation monitoring to be provided in annual compliance reports.

AREAS IDENTIFIED AS PRIORITIES UNDER A LANDSCAPE-LEVEL APPROACH

Due to the complex nature of landscape-level conservation, it was challenging to define whether each HCP was delivering compensatory mitigation at a landscape-level. If HCPs explicitly stated a landscape-level approach, or aligned with the definition of landscape-level approach, we then examined statements made in each progress report to determine if compensatory funds were being applied to areas identified as priorities under a landscape-level plan. For example, in the Escambia County Beaches HCP, five coastal dune areas in southern Alabama and the panhandle of Florida were chosen as priority areas under a landscape-level plan due to the key habitats for the endangered and endemic Perdido Key Beach Mouse. As a result, these dunes, while only a section of the portion of the total HCP land area, are vital habitats and therefore are protected above and beyond the rest of the acreage.[39]

Out of the 14 Plans delivering compensation aligned with a landscape-level approach, nine delivered compensation to priority areas. These nine Plans had clear maps and explanations of critical areas for conservation of habitats and species.

[38] MidWest Wind Energy HCP, Section 9.9.3 'Mitigation Implemented by Third Parties'. Pages 9-42.
[39] Escambia Beaches HCP, Page 20. Escambia Beaches HCP, Page 20.

There are many reasons why it was challenging to compile data on the delivery of compensatory mitigation under our set of 30 HCPs, and to assess and conclude whether or not the compensation delivered in monetary terms and/or habitat-based acres was on track with the HCP commitments. The primary challenges we encountered when analyzing the delivery of compensatory mitigation included:

- Annual Reports for HCPs are not available in a centralized location and must be obtained plan-by-plan. Although most are available online, several could only be obtained by directly contacting the Permittee.
- Each HCP is at a different stage of implementation, making direct comparisons of Plans difficult.
- Quantification of impacts and offsets are not standardized and are unique to the goals of each Plan and the needs of its species and habitats. Plans with specialized methods to quantify impacts and offsets must be understood and tracked separately, complicating tracking and reporting for the overall program.
- The timing and amount of compensatory mitigation required to be delivered can vary year to year, and is subject to changing conditions. For example, actual development may exceed expected development (or vice versa) in which case, depending on the goals of the HCP, the amount of compensation delivered will also change
- Yearly spending can exceed or fall short of budgeted spending. Not all progress reports explain why this occurred, and missing the targeted spending is not necessarily indicative of a failed Plan.
- Annual Reports did not all include detailed budget breakdowns to outline how funds were allocated for mitigation. Others noted the types of activities that were completed as part of the Plan's progress for the year, but did not detail how much this cost for education, research and species monitoring, for example.
- Several Annual progress reports did not report on the cumulative progress in addition to the current year's detailed progress. In these cases, tracking of overall progress would require referencing every progress report in the history of the HCP in order to build a cumulative total.
- Unexpected obstacles to implementation, such as legal challenges, are difficult to track and may correlate to delays in funds allocated.

Throughout our detailed analysis of the design and delivery of compensatory mitigation under HCPs, we found that the most comprehensive and transparent plans were those that had a dedicated website that included project background information, details on key stakeholders, the HCP itself, clearly defined and well-planned budgets, and easily accessible annual progress reports. We discuss two model HCPs in section 5.1 below.

Another challenge encountered in attempts to quantify the delivery of compensatory mitigation was lack of transparency where the Permittee had allocated fiscal responsibility for implementation of the HCP to a third party, or to a larger department in the case of County HCPs. One example discussed earlier in Section 4.3.2 was the City of Palm Bay HCP. Responsibility for implementation of compensatory mitigation was delegated to an expert third party. The HCP annual reports included development permit revenue paid to the conservation organization, but did not include any detail on what was actually delivered. This information gap also occurred in HCPs where the County is the Permittee and budgets to fund the HCP were part of the overall County budget. As a result, it was difficult to track actual spending by the County on delivery of the HCP as it became lost in the city budget or overall land management budget.

A good example of a Plan that provides a model framework for reporting and monitoring the delivery of compensatory mitigation is the Lower Colorado River Multi-Species Conservation Plan (LCR MSCP). The LCR MSCP is a multi-stakeholder partnership that seeks to balance the use of Colorado river resources with conservation of native species and their habitats. Each annual progress report outlined the cumulative and yearly compensation delivered and the anticipated budget for the next two years. This comprehensive, yet clear way to track progress should be replicated. The Plan took eight years to develop at a cost of $4.5 million, which included interim conservation measures. The Bureau of Reclamation is the implementing agency responsible for overseeing the Plan, and responsible for the development of annual work plans.[40] One of the advantages of the Plan is the distribution of funding, which is evenly distributed between federal and state entities to ensure funding is secured over the lifetime of the Plan. Additionally, the Plan established a Steering Committee that engages over 57 entities including federal and state agencies, municipalities, environmental organizations, and tribal leaders to provide oversight to support implementation. The Plan's annual report outlines a description of conservation activities accomplished in 2015, a summary of work underway for 2016, proposed work for 2017, and documents research and monitoring activities. Since the implementation of the Plan, annual progress reports have been developed with an annual funding matrix that clearly outlines the cumulative compensation delivered to date, and identifies the next two years of the budget and how it will fund projects to mitigate harm to species and habitats. A snapshot of the comprehensive funding matrix is shown below in Figure 13, with the full matrix attached in Appendix C. The funding matrix provides details regarding specific compensation for program administration, fish augmentation, species research, system monitoring, conservation area development and management, post-development monitoring, the adaptive management program, funding accounts, and public outreach.

[40] Lower Colorado MSCP Progress Reports:
http://www.lcrmscp.gov/steer_committee/annual_work_plans.html

Table 1-7.—Annual Funding Matrix

Work Task	Name	FY15 Approved Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Projected Estimate[1]	FY19 Projected Estimate[1]
A	**Program Administration**							
A1	Program Administration	$1,382,444.00	$1,140,477.22	$10,995,005.59	$1,411,966.00	$1,418,074.00	$1,418,074.00	$1,418,074.00
Closed[2]	Work Tasks Pre-FY15			$130,535.22				
		$1,382,444.00	**$1,140,477.22**	**$11,125,540.81**	**$1,411,966.00**	**$1,418,074.00**	**$1,418,074.00**	**$1,418,074.00**
B	**Fish Augmentation**							
B1	Lake Mohave Razorback Sucker Larvae Collections	$200,000.00	$183,182.91	$2,158,662.37	$200,000.00	$215,000.00	$215,000.00	$215,000.00
B2	Willow Beach National Fish Hatchery	$325,000.00	$312,306.38	$3,496,327.15	$325,000.00	$325,000.00	$325,000.00	$325,000.00
B3	Achii Hanyo Native Fish Rearing Facility	$160,000.00	$174,637.87	$1,244,414.09	$275,000.00	$50,000.00	$170,000.00	$170,000.00
B4	Southwestern Native Aquatic Resources & Recovery Center at Dexter	$250,000.00	$224,440.99	$2,142,765.08	$260,000.00	$260,000.00	$260,000.00	$260,000.00
B5	Bubbling Ponds Fish Hatchery	$960,000.00	$686,937.96	$2,739,536.89	$315,000.00	$330,000.00	$330,000.00	$330,000.00
B6	Lake Mead Fish Hatchery	$255,000.00	$238,485.46	$651,098.11	$240,000.00	$325,000.00	$325,000.00	$325,000.00
B7	Lake-Side Rearing Ponds	$200,000.00	$181,782.56	$2,050,370.87	$200,000.00	$200,000.00	$200,000.00	$200,000.00
B8	Fish Tagging Equipment	$125,000.00	$115,059.95	$878,805.06	$135,000.00	$135,000.00	$135,000.00	$135,000.00
B11	Overton Wildlife Management Area	$50,000.00	$0.00	$428,954.45	$50,000.00	$0.00	$0.00	$0.00
B12	Maintenance of Alternate Bonytail Broodstock	$0.00	$0.00	$0.00	$50,000.00	$65,000.00	$65,000.00	$65,000.00
Closed[2]	Work Tasks Pre-FY15		$0.00	$558,428.94	$0.00			
		$2,525,000.00	**$2,116,834.08**	**$16,349,363.01**	**$2,050,000.00**	**$1,905,000.00**	**$2,025,000.00**	**$2,025,000.00**
C	**Species Research**							
C2	Sticky Buckwheat and Threecorner Milkvetch Conservation	$11,000.00	$10,673.49	$115,851.18	$11,000.00	$11,000.00	$11,000.00	$11,000.00

Figure 13: Snapshot of the Lower Colorado MSHCP Annual Funding Matrix.

The detailed funding matrix provides a clear framework to understand the exact amount and purpose of compensation that has been delivered to date. A similar framework should be replicated where possible across all HCPs to explicitly outline the compensation that has been delivered, and how the funds are allocated.

The **East Contra Costa HCP** is another well-designed Plan that is a model plan for the overall HCP Program. It has a dedicated Conservancy website, which includes a plan overview, a link to all documents including the HCP, other signed agreements and all annual reports and "year in review" documents.[41] The site is easy to understand and navigate, which is preferred to scanning through thousand page reports or multiple phone call and emails to the Permittees. In addition to a detailed 153-page Annual Progress Report, the East Contra Costa County Habitat Conservancy also publishes a shorter 12-page "2015 Year in Review" report summary which includes easily understandable key highlights, charts and maps to clearly communicate the progress of the HCP for the year, in addition to providing a summary of received revenue to fund land acquisition, management, monitoring and restoration (Figure 14). In keeping with its landscape-level design and focus, the review report also includes a map showing progress towards the creation of the Preserve System (Figure 15).

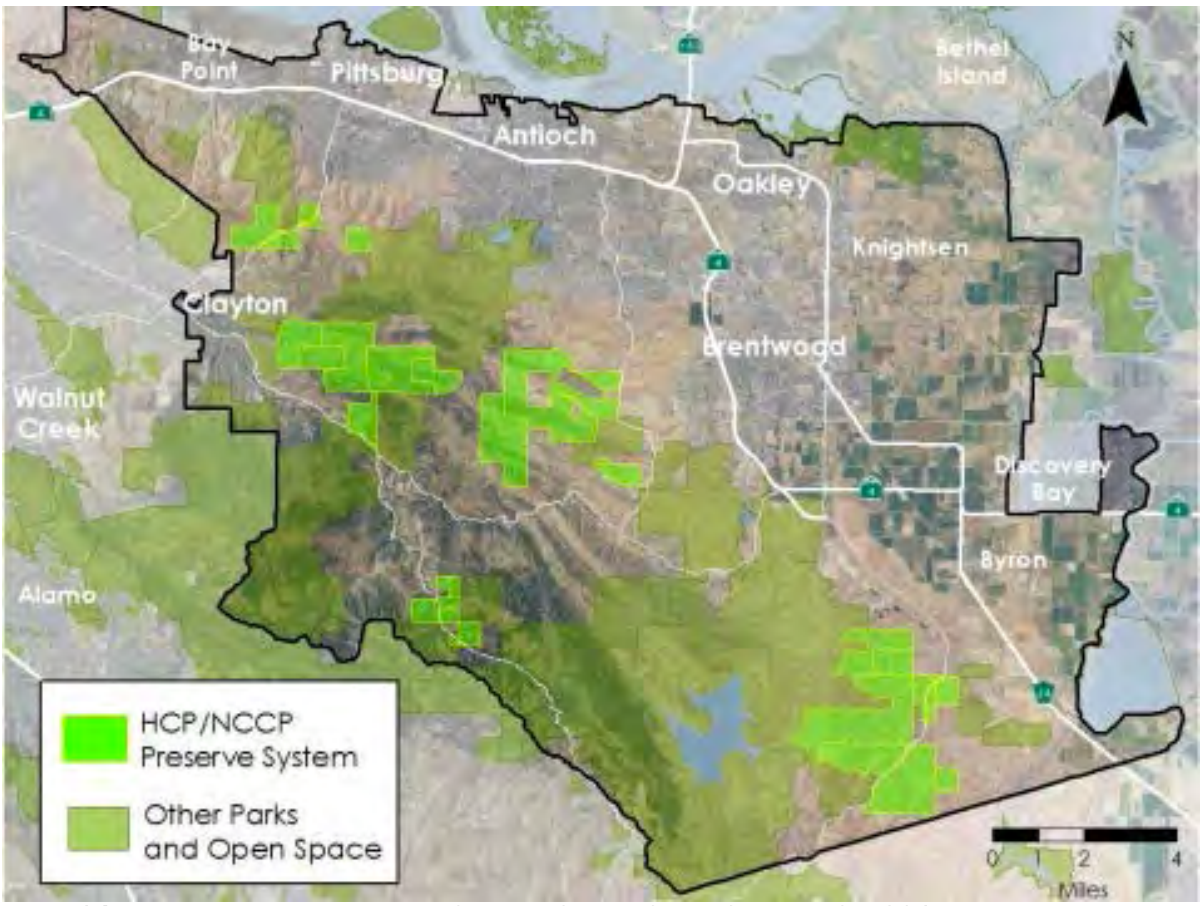


Figure 14: Land acquisition progress for East Contra Costa County HCP, 2015.

Additionally, the East Contra Costa HCP progress report graphically showed additional detail of acquisition by habitat type, and if mitigation was ahead of impacts for each habitat in the landscape as part of its "Stay Ahead Compliance" (Figure 16). This is a model example of the successful

[41] East Contra Costa Habitat Conservancy Website: http://www.co.contra-costa.ca.us/

application of a landscape-level approach to the design and delivery of compensatory mitigation under HCPs.

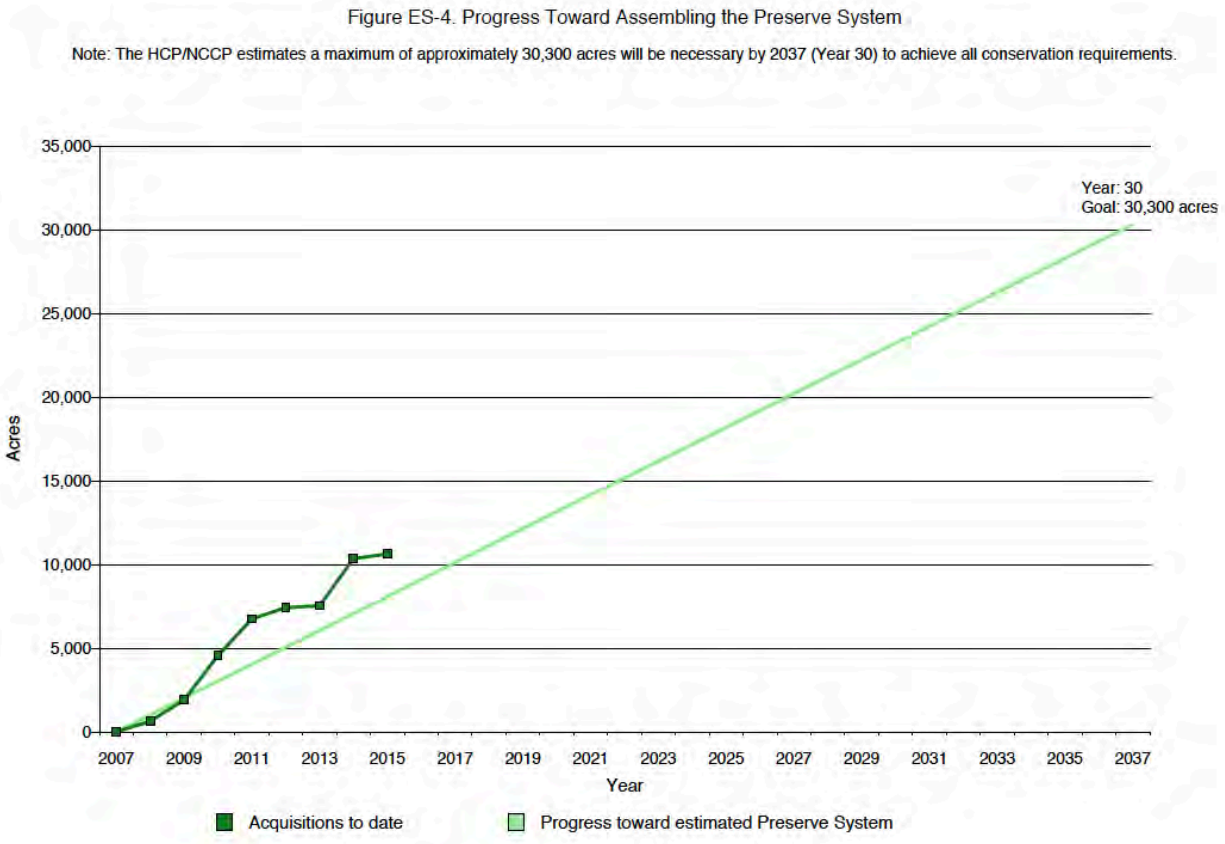


Figure 15: East Contra Costa HCP's Progress Towards Assembling the Preserve System (2015).

Figure ES-1. Stay Ahead Compliance

This is a graphical representation of data in Table 14.
The chart compares conservation achieved to impacts incurred according to the specific guidelines set forth in the Stay Ahead Provision.
The green bars display the percent of the land cover acquired as a percent of the conservation required.
The red bars display the percent of land cover impact incurred as a percent of the impact limits.
To comply with the Stay Ahead Provision, for terrestrial land covers the green bars need to be not more that 5% below the red bars.
With the extensive conservation effort to date, progress toward conservation goals have met, exceeded or vastly exceeded Stay Ahead Provision requirements.

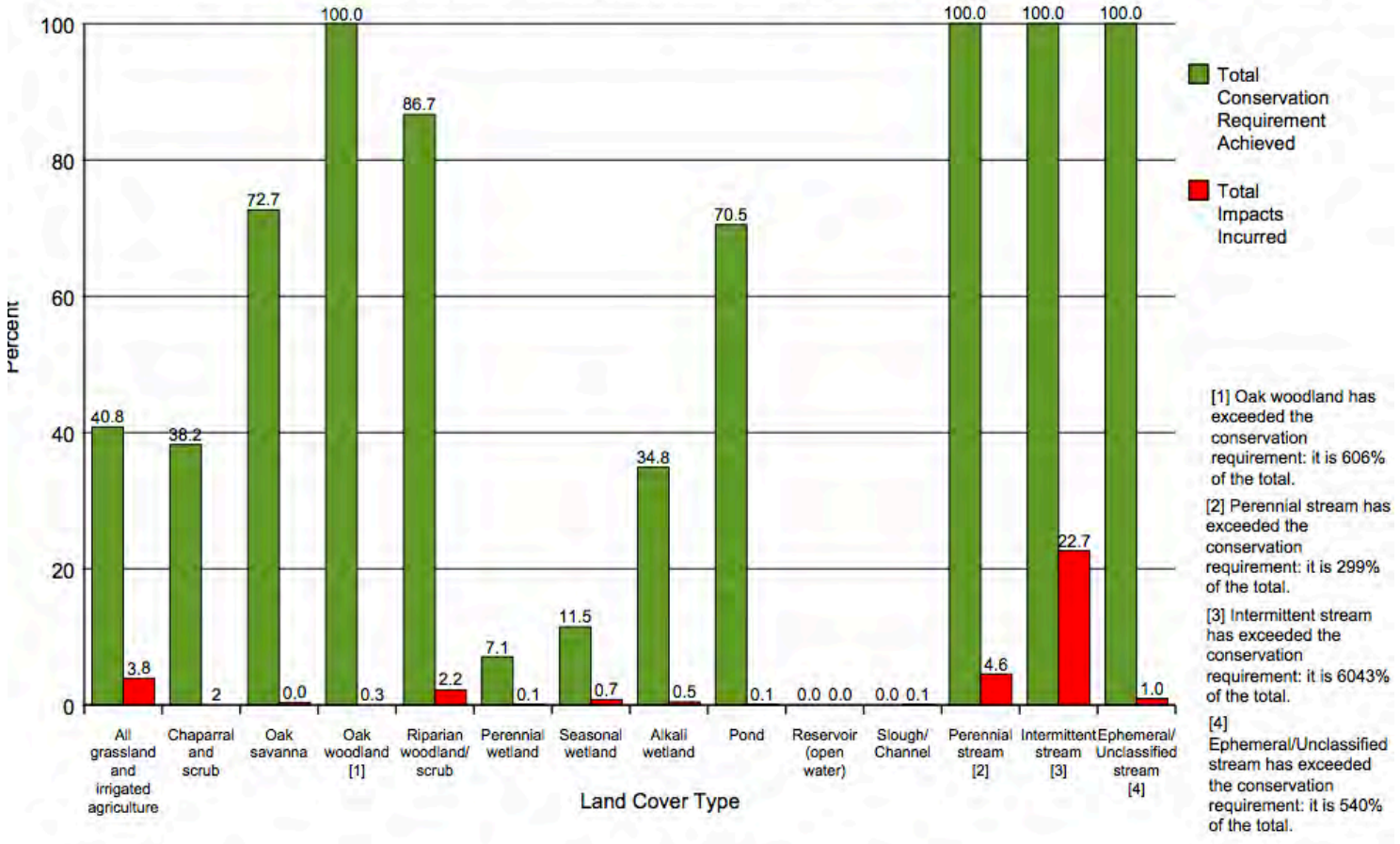


Figure 16: East Contra Costa HCP 'Stay Ahead' Compliance Reporting by Land Cover Type

In consideration of the challenges encountered throughout this study, we have proposed several recommendations that aim to ensure compensatory mitigation is tracked according to the obligations outlined in the Habitat Conservation Plans. Our recommendations are to improve access to information, standardize metrics to track progress, and create a streamlined framework to report and track progress of compensatory mitigation. We hope that these recommendations will help inform The Nature Conservancy's efforts to advance more effective species mitigation markets.

1. **Upgrade the National ECOS Database:**

   One of the primary challenges to understanding key trends and characteristics of HCPs was inconsistent and inaccurate data within the ECOS database. This included missing records, incomplete records, incorrect data and conflicting data. For example, for the Western Riverside HCP species data in the original ECOS database received from USFWS said the Plan had 27 listed and 137 non-listed species; online ECOS had 28 listed and 136 non-listed species; yet the HCP noted it will cover 146 species.

   These challenges made it difficult to accurately analyze trends and to evaluate the current status of the national HCP program. It is imperative to ensure that the online database is accurate and updated on a regular basis, including new Plan information and updating information when existing Plans are amended. We recommend that the USFWS fund a database reconciliation project to reconcile conflicting records and correct incomplete and inaccurate data.

   Within the same database, permittees, or project managers should have access to upload progress reports to keep all of the information accessible. Continuously updating the information will ensure the inputs are accurate. Extending the platform to include a centralized location to input progress will help to monitor progress with a specific focus on compensatory mitigation. The integration of a high-level framework to track spending on mitigation projects under HCPs in the national database will provide a single location to input and monitor the progress across all Plans, enabling the USFWS to have a better understanding of if and how the Plans are meeting the planned compensatory mitigation obligations

2. **Standardize Metrics to Track Progress:**

   Establishing metrics to track the progress of each Plan will enable the USFWS to monitor progress for each Plan and across the program. However, HCPs have different goals and corresponding commitments based on the unique nature of their mitigation strategy. As such, we recommend the following standardized metrics which can be broadly applied to all plans across the program:

   - Total mitigation funding spent, and additionally where applicable to the individual Plans
   - Total acres of land acquired and restored, and/or
   - Conservation bank credits purchased and withdrawn.

   These metrics can then be compared against the original Plan commitments and budget. For example, for a HCP that creates a preserve system, the Plan can establish a straight-line target to the goal at the end of the Plan term (as shown in Figure 13 for the model East Contra Costa HCP). Annual Progress reports should clearly identify if the HCP is on track to reach its target.

3. **Establish a Framework for Reporting and Monitoring Progress:**
The current HCP reporting process takes a plan-by-plan approach and lacks a central location to track and collate information on the implementation activities and progress of each active HCP. As a result, the process to acquire and analyze progress reports is time-consuming. In order to improve this process to truly understand if compensation is delivered, there needs to be a central location to access and report information specifically on compensatory mitigation delivered, compared to planned compensatory mitigation across all Plans. This database can be a resource to begin to close the information gaps that currently exist in understanding the effectiveness of each HCP.

The framework will align with the methodology used for Phase 3 to compare planned compensatory mitigation to compensation delivered to date. Recommended categories within the framework are shown in Figure 17, and include:

Planned Compensatory Mitigation:

- Projected Budget
- Land Acquisition or Restoration in Acres
- Conservation Bank Credits "Banked"
- Non-Habitat Based Compensatory Mitigation

Compensation Delivered to Date

- Funding Spent
- Land Acquisition or Restoration in Acres
- Conservation Bank Credits Withdrawn
- Non-Habitat Based Compensatory Mitigation
    i. Administration/Operations
    ii. Monitoring
    iii. Education
    iv. Research
    v. Species Management
    vi. Other

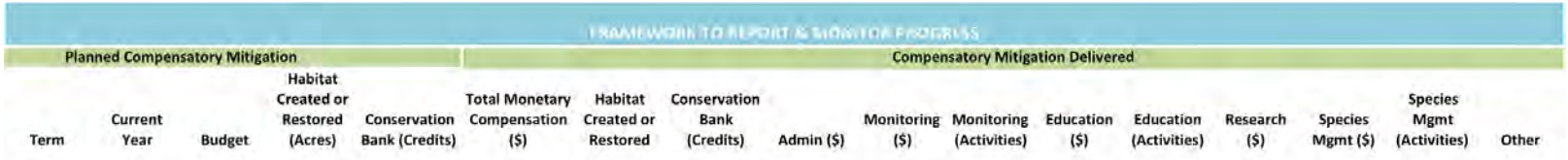


Figure 17: A Sample Compensatory Mitigation Reporting Framework

Since 1983, the HCP program has provided substantial levels of mitigation funding for conservation and has helped establish a mitigation market for species. The HCP program is an important policy tool which, when well planned, implemented and monitored, can help to accelerate renewable energy development without negatively impacting threatened species and their habitats.

Throughout our study, we encountered obstacles in accessing accurate, complete, and consistent information about HCPs. Therefore, we recommend improvements to the accessibility, accuracy, and consistency of the national ECOS database of HCPs.

The ability to monitor and track the implementation of Plans begins with strong plan design, which includes well-defined budgets and clear quantification of impacts and offsets. Plans whose frameworks provide good model examples to inform the development of future HCPs include the East Contra Costa HCP and NiSource HCP. These HCPs are designed to deliver compensation using a landscape-level approach. The plans include maps and identify priority habitats ahead of development. These maps are then used during implementation to track impacts and ensure mitigation stays ahead of development. Due to the complexities of East Contra Costa HCP and NiSource HCP, each took seven and eight years respectively to develop. However, once a standardized framework is developed, stakeholders will be able to more efficiently complete their Plans and monitor progress against HCP commitments.

The draft HCP Handbook, compiled by the USFWS in 2016, discusses the importance of time spent upfront planning in Section 2.2.2 "Going Fast by Starting Slowly." It discusses the advantages of thorough planning and how to kick-start the process, which should also assist in more efficient planning. Threatened species and the urgent need to accelerate the transition to a renewable energy future means species and their habitats do not have time for a long planning process.

TABLE 8-2
TOTAL LOCAL PROGRAM COSTS
(not adjusted for inflation)
25 years and 75 years

Program Costs	First 25 years	75 years
Additional Reserve Lands Acquisition (56,000 acres)	$733.6M	$733.6M
Preserve Management (152,000)	$111M	$424.5M
Adaptive Management (152,000)	$44.5M	$214.3M
Biological Monitoring (152,000)	$34.7M	$112M
Program Administration	$30M	$ 55M
TOTAL COSTS	**$953.8M**	**$1,539.4M**

Figure 18: Western Riverside HCP Budget Overview[42]

Other model plans such as Western Riverside County MSHCP include clear and detailed budgets in the HCP plan itself, combining funding from multiple sources including permit fees, state and federal funding, charity and endowments (Figure 18).

[42] CVAG MSHCP Plan Section (2007) (pg. 8-3, *Final Recirculated Coachella Valley Multiple Species Habitat Conservation Plan*. pg. 4-13 Retrieved from http://wrc-rca.org/Permit_Docs/MSHCP_Docs/volume1/Vol1-Sec8.pdf

Comprehensive progress reports are essential for outlining compensatory mitigation efforts and ensuring their timely implementation. These reports should be easily accessible in a centralized location. We recommend that the national ECOS database should be updated firstly to correct issues with the integrity of its data, and also to add a monitoring functionality so that it acts as a centralized repository for both the HCP plans and annual progress reports.

We also recommend that the online ECOS database be upgraded to add monitoring functionality based on our suggested framework. By adding website security, regional officers and national USFWS staff will be able to logon to non-public access areas of the database. This would resolve the issue of double entry, which currently is a roadblock to efficiency, due to the requirement for regional officers to update both their regional tracking system and the ECOS national database.

As renewable energy development expands to meet the United States Greenhouse Gas Emissions Reduction Target, comprehensive HCPs that effectively balance conservation and development will be critical. Further, thorough progress reporting that clearly tracks compensatory mitigation efforts against their delivery will help give insight into the effectiveness of the HCP program.

The implementation of our recommendations will enable the USFWS and other stakeholders are able to more easily track progress of the HCPs, and understand whether or not permittees are delivering on their HCP commitments, and how they are offsetting the impacts of development. With the anticipated growth of renewable energy development, it is critical that the delivery of the HCP program is easily understood by the USFWS, communities, advocates and developers.

APPENDIX A: HCP ONE-PAGE SUMMARIES

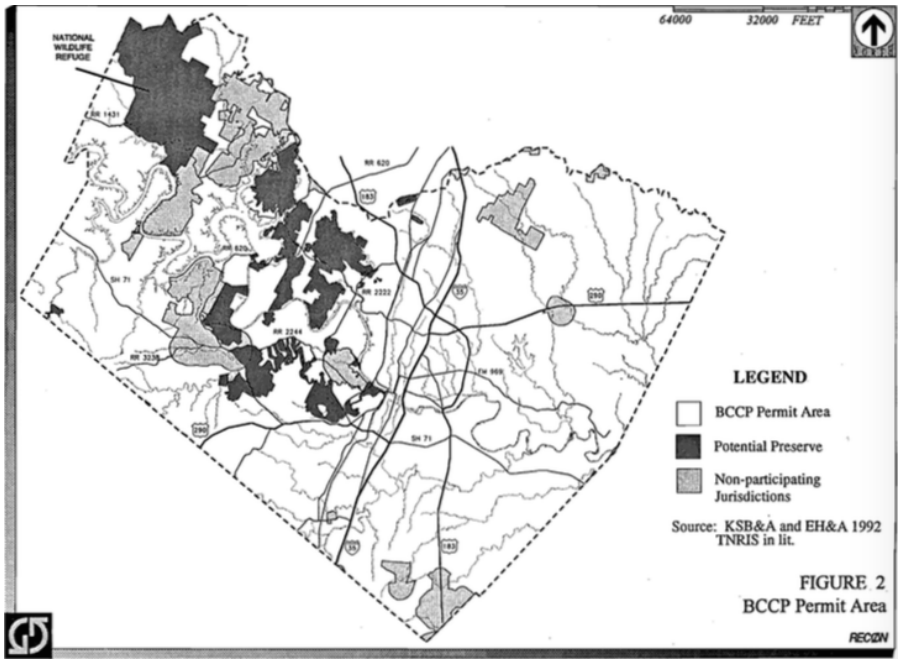
Balcones Canyonlands (BCCP)

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
2	Texas	633,000	05/02/1996	33	30	Mixed oak woodlands Juniper woodlands Karst/limestone cave habitat	Multiple	YES 5

I. KEY ISSUES

1. The local USFWS office was unable to keep up with the demand for permits, resulting in a practical moratorium on development in the area

2. The USFWS suggested an HCP as a solution that would streamline permitted development and ensure protection of threatened species



II. PRIMARY OBJECTIVES

1. Protect eight federally listed endangered species, including two songbirds and six invertebrates

2. Protect habitat for other native plants and animals of the Texas Hill Country and contributes to clean air, clean water and quality of life for all Central Texas residents

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$81,222	$159,000,000
Habitat Based (Creation)	31,785 acres	30,428 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Third-party Conservation Bank, In-lieu Fee Model, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

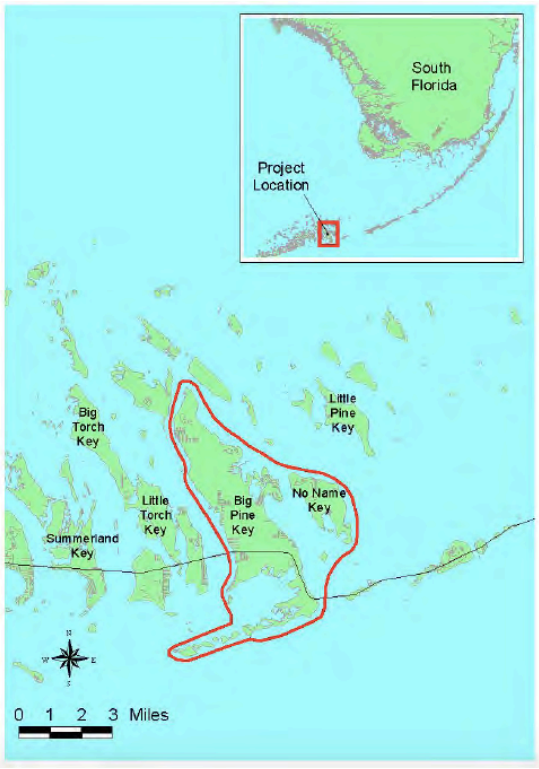
V. COMPENSATION DELIVERED: YES

Big Pine Key Deer

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
4	Florida	7,031	06/09/2006	3	17	Pine rockland Mangrove, Tropical hardwood hammock	Multiple	YES 10

I. KEY ISSUES

1. Urban and recreational development while ensuring the protection of threatened species. The development of 200 homes or no more than 168 acres of development is anticipated.
2. Mitigate loss of approximately 36,000 acres of Covered Species' habitat in a manner consistent with the County's CLS reserve design



II. PRIMARY OBJECTIVES

The HCP outlines a conservation strategy to protect the habitat of the endangered Key Deer, endangered Lower Keys marsh rabbit and threatened eastern indigo snake while allowing limited residential, commercial, recreational, and municipal development on Big Pine and No Name Keys. The HCP includes conservation measures to protect Key deer movement corridors and provide habitat mitigation at a 3:1 ratio. This will:

1. Allow for limited additional development (urban development) in Big Pine Key and No Name Key, Monroe Country Florida while maintaining the long-term viability of the covered species and their habitat
2. Ensure future development does not have a negative impact on covered species habitat
3. Limit the increase in human-related mortality of Key deer and Lower Keys marsh rabbit to a level that would make quasi-extinction (defined as the probability that the population fall to 50 or fewer females at least once in 50 years) unlikely
4. Keep secondary impacts to Lower Keys marsh rabbit to current levels or below

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	$11,685,000
Habitat Based (Creation)	Approx. 670 acres	500 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Other (additional revenue from grans and programs including tourist impact tax revenue).

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: NO

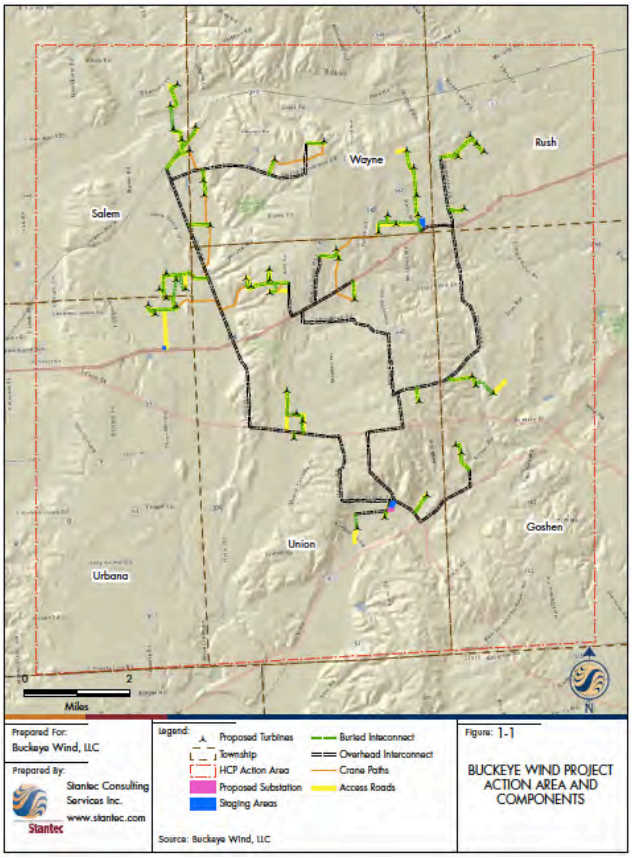
V. COMPENSATION DELIVERED: N/A

Buckeye Wind/Ever Power HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
3	Ohio	80,000	07/18/2013	1	30	Action Area is rural, predominantly agriculture, with about 10% comprised of forested areas	Multiple	NO

I. KEY ISSUES

Indiana bats could be injured or killed by colliding with or coming in close proximity to operational turbines



II. PRIMARY OBJECTIVES

1. Allow incidental take of the federally endangered Indiana bat (Myotis sodalis) as a result of actions associated with the proposed Buckeye Wind Power Project (Project)

2. Analyze potential impacts to the Indiana bat from construction, operation, maintenance, and decommissioning of the Project

3. Describe how the Project will meet the criteria for issuance of an ITP set forth in section 10(a)(2) of the ESA and the implementing regulations, 50 Code of Federal Regulations (CFR) 17.22

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	$11,700,000
Habitat Based (Creation)	-	217 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Third-party Conservation Bank

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: N/A

Charlotte County Capital Improvement Projects

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
4	Florida	4,500	01/03/2013	4	30	Coastal scrub	1	YES 1

I. KEY ISSUES

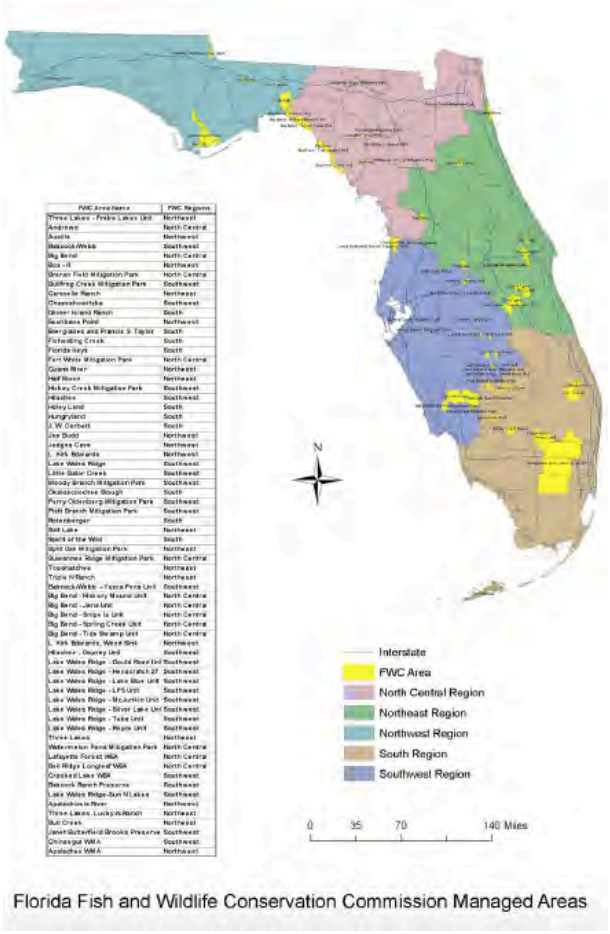
1. Development in occupied scrub-jay habitat requires developing an HCP and obtaining an ITP from the USFWS, as well as consultation and approval from the Florida Fish and Wildlife Conservation Commission

2. A comprehensive countywide HCP will reduce the need, time, and cost associated with the development of individual HCPs for parcels on a project-by-project basis while ensuring the persistence of the scrub-jays in Charlotte County

II. PRIMARY OBJECTIVES

1. Manage impacts to the state and federally threatened Florida scrub-jay, for capital improvement projects over a twenty-year period, as well as to provide adequate mitigation to ensure the protection of the scrub-jay within Charlotte County

2. Ensure compliance with the Endangered Species Act, provide greater regulatory certainty for development, and enhance the recovery and long-term viability of the scrub-jay within Charlotte County



Florida Fish and Wildlife Conservation Commission Managed Areas

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	$38,373,600
Habitat Based (Creation)	4,500 acres	1,336 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Single-user Bank Sponsored by HCP Permittee

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

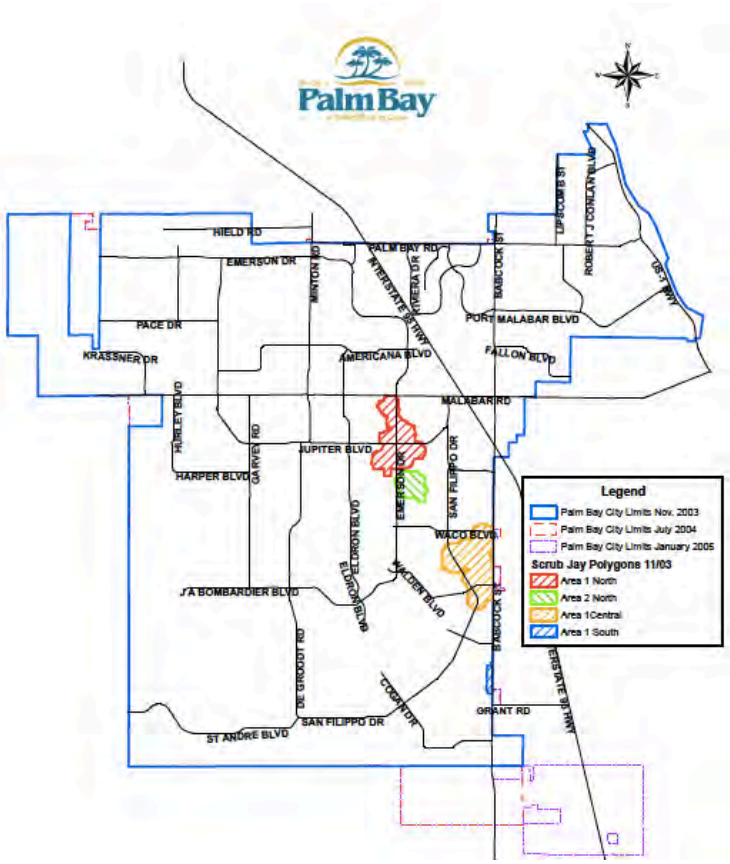
V. COMPENSATION DELIVERED: YES

City of Palm Bay

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Number of Applicants	Progress Reports
4	Florida	46,291	04/19/2007	3	20	1	YES 1
Habitat Type	Many areas within the City limits that support Florida scrub-jays also support typical scrub habitat. However due to the elimination of suitable habitat within the Port Malabar subdivision atypical habitat, such as slash pine flatwoods is also currently utilized. In 1993 53 families of scrub-jays were documented within the city limits, currently only 20 families remain. Single family lots (1/4 - 1/3 acre) and commercial lots will be covered under the permit. Township 29South, Range 36 East, all sections						

I. KEY ISSUES

Every time a new building is built a fee will be provided proportional to the acres developed. The fees will go to the Environmental Fee Fund established by the City of Palm Bay. The funds raised will be used by TNC and the City of Palm bay to implement monitoring and recovery actions



II. PRIMARY OBJECTIVES

The USFWS estimates that the City currently supports 20 families of scrub-jays in four areas (the scrub-jay polygons) totaling 1020.8 acres (USFWS 2001) (scrub-jay polygons shown in Figures 3, 4 and 5). This area is approximately 2.2 percent of the City's 46,291 acres (18,733 ha) (City of Palm Bay, July 2005). Twenty scrub-jay families, 40 indigo snakes (Appendix A) and 1233 gopher tortoises (Appendix A) (if determined to be an endangered or threatened species) would be subject to the "incidental take" authorization

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$686,537	$10,800,000
Habitat Based (Creation)	-	-

IV. IMPLEMENTATION METHOD: Permittee Responsible, Other

V. ADAPTIVE MANAGEMENT: NO

VI. LANDSCAPE LEVEL PLAN: NO

V. COMPENSATION DELIVERED: YES

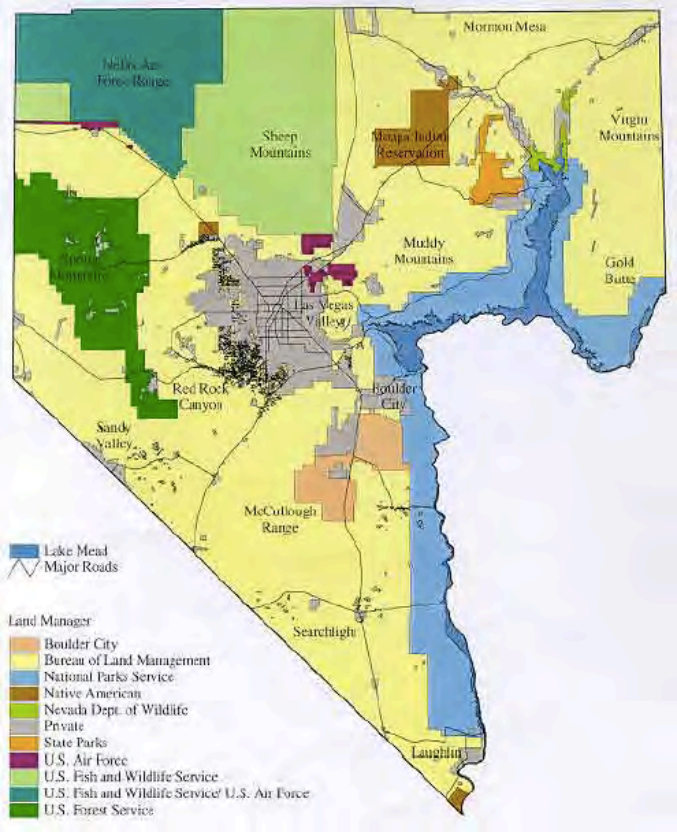
Clark County Multiple Species HCP (7 permittees)

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Number of Applicants	Progress Reports
8	Nevada	5,000,000	01/09/2001	76	30	Multiple	YES (but only presentations slides available) 8
Habitat Type	Mojave desert scrub, salt desert scrub, sagebrush, mesquite/catclaw, blackbrush, pinyon-juniper, mixed conifer, bristlecone pine, alpine, desert riparian/aquatic, springs, and other vegetation types						

I. KEY ISSUES

1. Existing uses and activities on lands managed by public agencies as well as proposed land uses within Clark County

2. Growth of the population in the Las Vegas Valley and rural communities, with the exception of residential, industrial, and commercial land development, these activities will occur on both non-Federal and Federal lands



II. PRIMARY OBJECTIVES

Achieve a balance between Long-term conservation and recovery of the diversity of natural habitats and native species of plants and animals that make up an important part of the natural heritage of Clark County, and the orderly and beneficial use of land in order to promote the economy, health, wellbeing, and custom and culture of the growing population of Clark County

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$123,000,000	$106,000,000
Habitat Based (Creation)	-	-

IV. IMPLEMENTATION METHOD: Permittee Responsible, In-lieu Fee Model, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

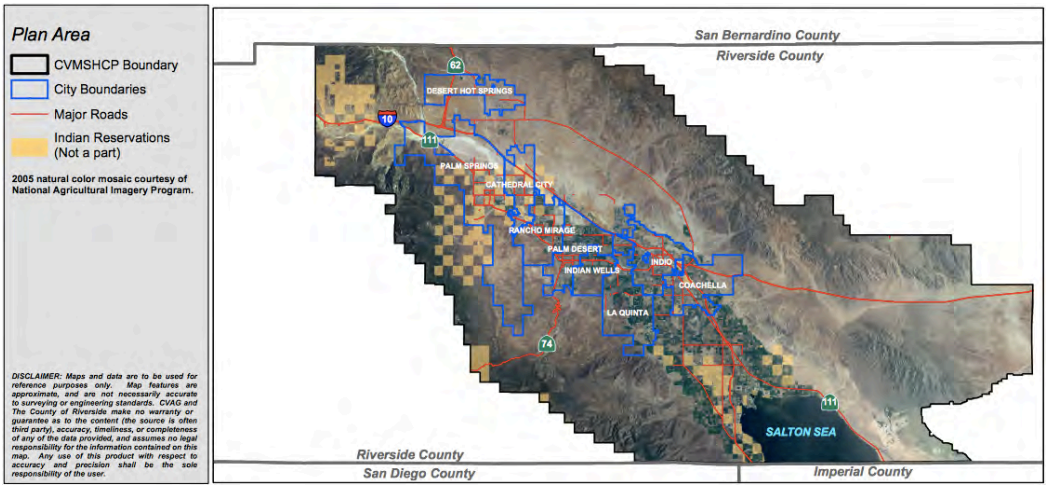
V. COMPENSATION DELIVERED: YES

Coachella Valley Multi-Species HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
8	California	1,206,578	10/01/2008	27	75	27 natural communities were identified in the plan area boundary	Multiple	YES 2

I. KEY ISSUES

Growing human population and development vs. protection of species, habitats, and ecological processes



II. PRIMARY OBJECTIVES

1. Balance environmental protection (Protect 27 species and 27 natural communities, ecosystems, linkage/corridors, and ecosystem processes) and economic development

2. Provide an efficient, streamlined regulatory process to standardize mitigation/compensation measures for the covered species

3. Simplify compliance with endangered species related laws, by obtaining Incidental Take Permits (ITP)

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$11,800,000 (For 2014 & 2015)	$2,038,000
Habitat Based (Creation)	8,198 acres	115,140 acres*

IV. IMPLEMENTATION METHOD: Permittee Responsible, Third-party Conservation Bank, In-lieu Fee Model, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

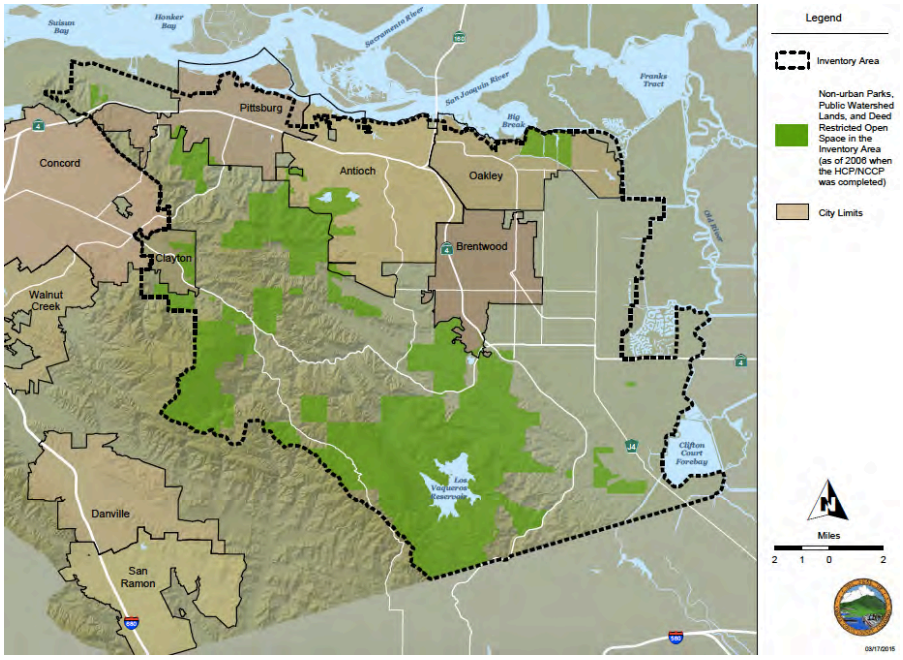
V. COMPENSATION DELIVERED: YES

**The Plan will result in the establishment, monitoring and management of a Reserve System consisting of approximately 723,480 acres. Within this, Permittees have an obligation to conserve approximately 115,140 acres in the Conservation Areas.*

East Contra Costa County HCP/NCCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
8	California	175,435	07/25/2007	26	30	-	Multiple	YES 6

I. KEY ISSUES



1. Contra Costa County's population is predicted to grow by 127,000 people between 2007 and 2025, providing important new housing for the San Francisco Bay Area's growing workforce. A significant portion of this growth will occur in east Contra Costa County in habitat that supports state and federally listed species, resulting in a conflict between conservation and development

2. Key Issues in urban development include housing, transportation and economic development activities. In 2015 for example, the HCP permitted the development of road infrastructure, residential development and utility infrastructure (pipeline)

II. PRIMARY OBJECTIVES

The primary means to offset the impacts of development in the County is to conserve and restore lands in a Preserve System that will encompass approximately 23,800–30,300 acres. This land will be managed to benefit the 28 species covered by the Plan as well as the natural communities that they, and hundreds of other species, depend on for habitat

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$61,773,800	$325,000,000
Habitat Based (Creation)	12,283 acres	30,300 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Third-party Conservation Bank, Other. This plan uses a "fair share apportionment" system to distribute the cost of new development with the public paying fees per acre (based on location) in addition to funding via state and federal sources.

V. ADAPTIVE MANAGEMENT: YES

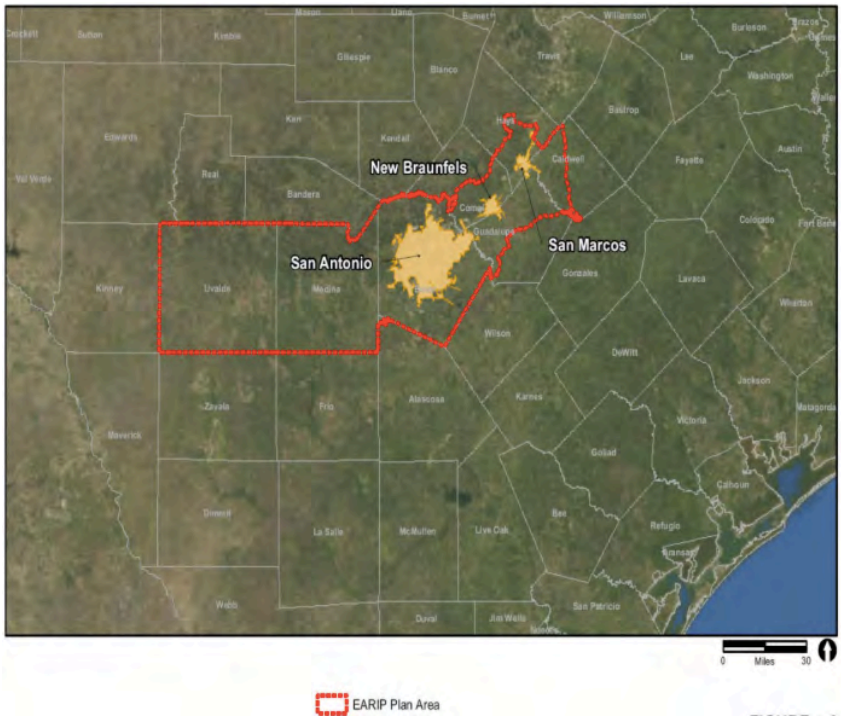
VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: YES

Edwards Aquifer Authority Recovery Implementation Program / EARIP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
2	Texas	10,758,976	03/18/2013	7	15	Edwards Aquifer	Multiple	YES 3

I. KEY ISSUES



1. The Aquifer is a unique groundwater resource, extending 180 miles from Brackettville in Kinney County, Texas, to Kyle in Hays County, Texas and it is the primary source of drinking water for over two million people in south-central Texas and serves the domestic, livestock, irrigation, industrial, municipal, and recreational needs of the area

2. The Aquifer is the source of the two largest springs remaining in Texas. Eight species that depend directly on water in or discharged from the Aquifer are federally-listed as threatened or endangered

3. The primary threat to these Aquifer-dependent species is the intermittent loss of habitat from reduced spring flows

II. PRIMARY OBJECTIVES

1. Protect the federally-listed species potentially affected by the management and use of the Aquifer and certain other activities in the Comal and San Marcos ecosystems

2. In addition to meeting the legal requirements of Section 10(a) of the Endangered Species Act, the Applicants have committed to benefit the Covered Species by contributing to their recovery

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$30,105,720	$261,907,955
Habitat Based (Creation)	-	-

IV. IMPLEMENTATION METHOD: Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: YES

Escambia County Beaches

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
4	Florida	1,200	12/05/2014	8	30	Perdido Key from the Gulf of Mexico to Big Lagoon. Wet and dry beach, foredune, primary, secondary, and scrub dune habitat, lagoon shoreline	1	YES 1

I. KEY ISSUES

There is a noted occurrence of federally listed species on Perdido Key, Florida, and an increase in individual incidental take permit applications for non-federal related developments. This HCP aims to reduce that increase

II. PRIMARY OBJECTIVES

1. Provide landowners and Escambia County with a streamlined permitting process that will assist in obtaining timely incidental take authorization of Perdido Key beach mice, nesting sea turtles and non-breeding piping plover concerning development, some County activities, and public infrastructure improvements

2. Provides conservation measures to avoid and minimize the take

3. Establish a plan that will effectively and efficiently manage impacts from development, Escambia County infrastructure improvements, and other activities; and develop a process by which this HCP will be managed by Escambia County to sustain the environmental, social, recreational, cultural, and economic values of Perdido Key

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$246,225	$24,000,000
Habitat Based (Creation)	24 acres	240 acres

IV. IMPLEMENTATION METHOD: In-lieu Fee Model, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: YES

Fowler Ridge Wind Farm

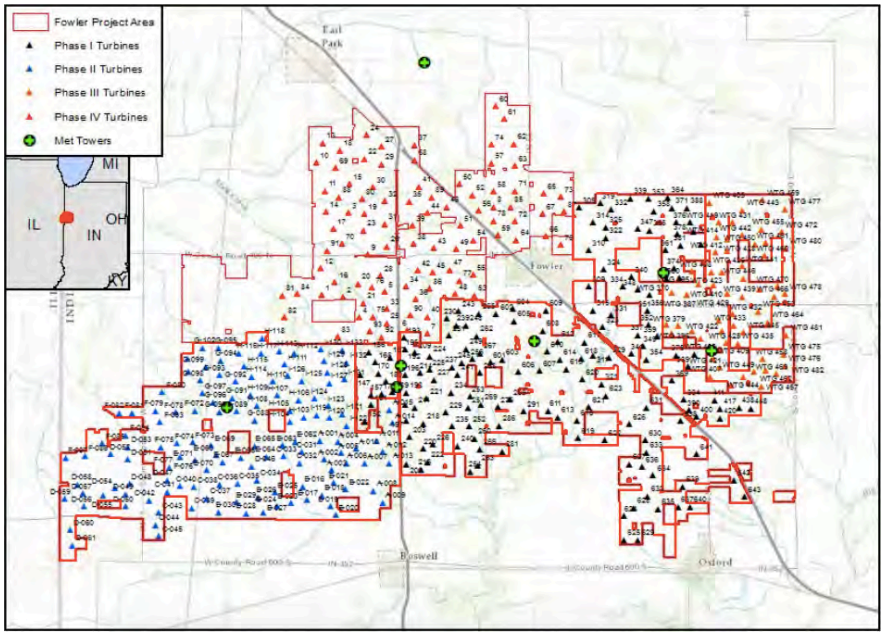
Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
3	Indiana	80,000	07/18/2013	1	21	Rural, predominantly agriculture, with about 10% comprised of forested areas.	Multiple	YES 2

I. KEY ISSUES

1. The purpose and need for the ITP is to ensure that incidental take resulting from the proposed operation of the Fowler Ridge Wind Farm (FRWF) will be minimized and mitigated to the maximum extent practicable, and will not appreciably reduce the likelihood of the survival and recovery of the Indiana bat in the wild
2. The ITP application requires the development and submission of an HCP, which is designed to ensure the continued existence and help in the recovery of the Indiana bat while allowing for the limited incidental take of the species during the operation of the FRWF

II. PRIMARY OBJECTIVES

1. Maintain the integrity of Indiana bat migration through the Project area
2. Protect a vulnerable wintering population of Indiana bats in a Priority 1 hibernaculum, thereby promoting the security of a critical component of the Indiana bat population in the MRU
3. Increase survival and reproductive capacity of Indiana bats on their summer range, thereby promoting population growth of Indiana bat maternity colonies in the MRU
4. Increase understanding of the factors that contribute to increased risk to Indiana Bats at wind power facilities



5. Optimize electrical output of the Project to realize the environmental benefit of wind energy, specifically, increased generation from wind energy facilities has the potential to offset demand for other energy generation technologies that produce carbon emissions that have been shown to contribute to global climate change, identified as a potential risk to Indiana bats

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	$4,922,180
Habitat Based (Creation)	-	120 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Third-party Conservation Bank, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: NO

V. COMPENSATION DELIVERED: N/A

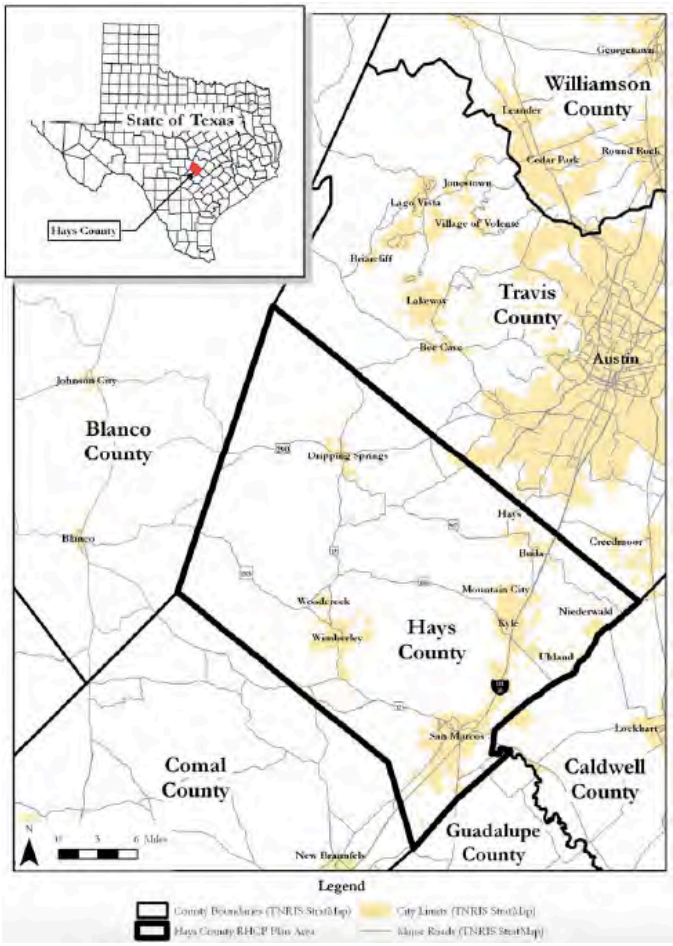
Hays County Regional HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
2	Texas	435,000	06/12/2012	2	30	Hill Country Ecosystem	Multiple	NO

I. KEY ISSUES

1. The population of Hays County is expected to increase 150% to 300% over the next 30 years, making it one of the fastest growing populations in Texas

2. Projected development and infrastructure projects could cause the loss of approximately 22,000 acres of potential habitat for the federally endangered golden-cheeked warbler in Hays County over the next 30 years. Similarly, the county could lose approximately 3,300 acres of potential black-capped vireo habitat



II. PRIMARY OBJECTIVES

1. Create preserve system within Hays County that effectively mitigates for incidental take of the golden-cheeked warbler and black-capped vireo and coordinates and consolidates mitigation requirements from projects scattered across the county into larger, more biologically significant preserve blocks

2. Protect and manage between 10,000 and 15,000 acres for endangered species to generate enough mitigation credits to balance the anticipated level of participation in the RHCP

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	$ 182,600,000
Habitat Based (Creation)	-	12,500 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Single-user Bank Sponsored by HCP Permittee, In-lieu Fee Model

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: N/A

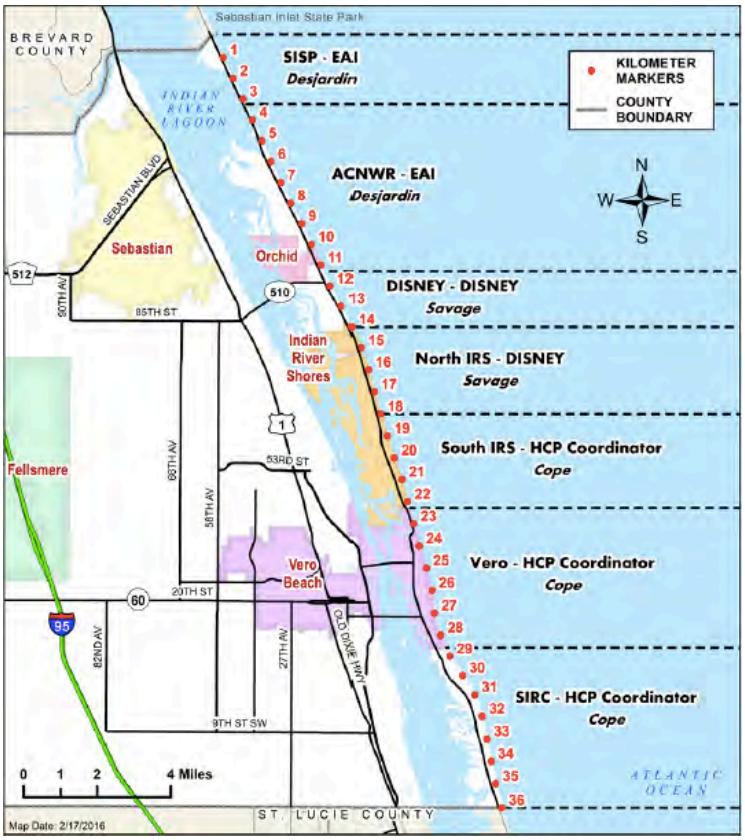
Indian River County Sea Turtle

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
4	Florida	110	01/12/2004	3	30	Shoreline Beach Frontal dunes	Multiple	YES 8

I. KEY ISSUES

1. Human impacts include beach construction projects built to protect and maintain beachfront property. Except for seawalls, most of these impacts are usually avoided through the permitting process or the effects are short-lived. Other negative impacts such as artificial lights, obstacles on the beach (e.g. beach furniture) and domestic dog predation are unfortunately common. In addition, lighting beach fires and digging deep holes can occasionally kill sea turtles.

2. People residing on oceanfront property frequently walk on the beach at night. Turtles encountered on the beach at night prior to commencement of oviposition (egg laying) are easily frightened back into the ocean. Artificial beachfront lighting deters adult female turtles from coming ashore to nest and interferes with the natural ability of hatchling sea turtles to properly orient to the ocean after leaving the nest



II. PRIMARY OBJECTIVES

Develop a framework for effectively improving the productivity of the County's beaches as sea turtle nesting habitat while providing beachfront property owners with a means of protecting eligible and vulnerable structures from erosion following acute storm events

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	$13,200,000
Habitat Based (Creation)	110 acres	110 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: N/A

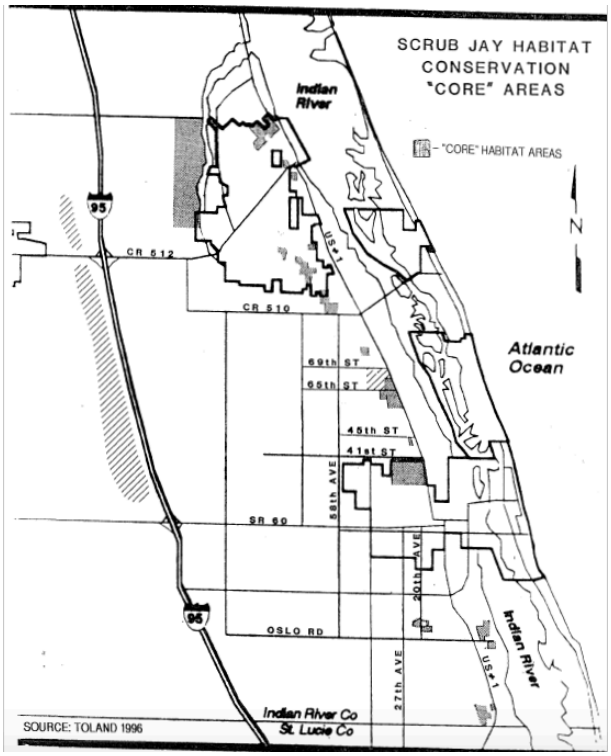
Indian River/Sebastian Areawide

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
4	Florida	330.5	09/19/2000	1	30	-	Multiple	YES 2 reports each covering 5 years

I. KEY ISSUES

1. Implementation of a functioning HCP that directs immediate and intensive habitat restoration and management of the remaining Atlantic Coastal scrub habitat patches is needed not only to ameliorate the severe Florida scrub-jay population decline, but also to relieve the regulatory burden to residential lot owners desiring to develop their properties

2. Demographic studies of colorbanded scrub-jays in known territories conducted within the incorporated limits of the City of Sebastian, comprised primarily of the Sebastian Highlands residential subdivision, during the seven year period, 1991 to 1998, documented a 54% decline from 35 breeding pairs to 16 breeding pairs



II. PRIMARY OBJECTIVES

1. Provide for greater regulatory certainty to the Applicants and private residential lot owners within the platted residential subdivision of Sebastian Highlands in meeting the fast-growing social and economic needs of this residential community

2. Protect the broad range of native species characteristic of the Atlantic Coastal Ridge scrub ecosystem

3. Enhance the recovery potential of the North Indian River County/South Brevard County metapopulation, the fourth largest Florida scrub-jay metapopulation and most important metapopulation for species recovery along the Florida's Atlantic Coast, by increasing the population persistence probability of the Sebastian scrub-jay subpopulations

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	-
Habitat Based (Creation)	330.5 acres	330.5 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible

V. ADAPTIVE MANAGEMENT: NO

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: N/A

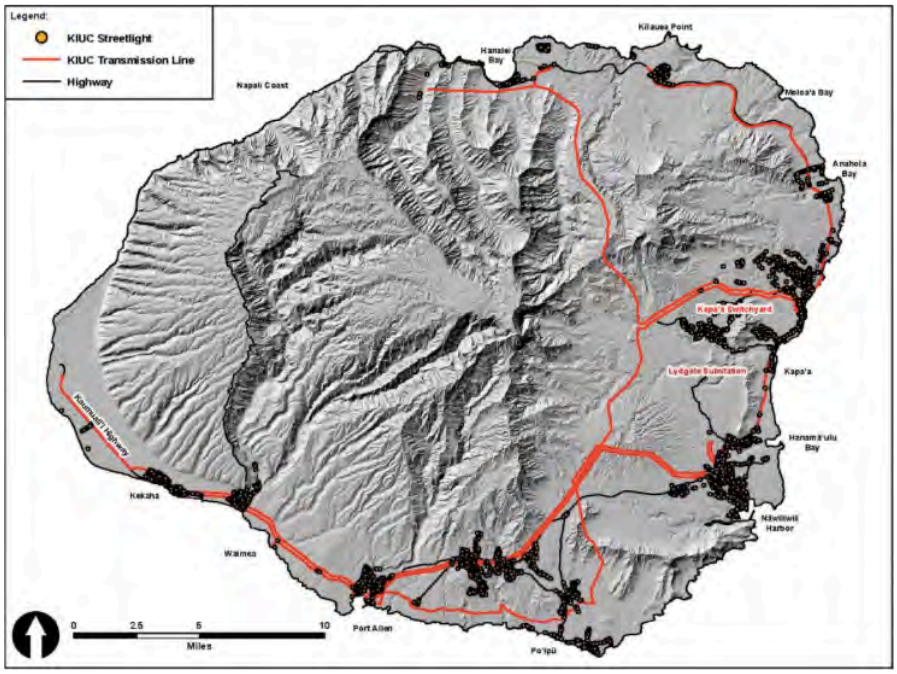
Kauai Island Utility Cooperative (KIUC)

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
1	Hawaii	350,000	05/13/2011	3	5	Powerlines-Flight Space, Interior high elevation nesting colonies	1	YES 3

I. KEY ISSUES

1. KIUC's electrical transmission and distribution system is largely above ground and consists of poles and wires that extend from 25 to more than 100 feet above ground. The overhead wires and poles occupy airspace through which birds fly, and collisions between birds and these facilities have been reported

2. KIUC anticipates requesting incidental take coverage for the endangered Hawaiian petrel, threatened Newell's shearwater, and a species proposed for listing as endangered, the band-rumped storm-petrel.



II. PRIMARY OBJECTIVES

Address the effects of its generation, transmission, and distribution of electricity on listed species within the plan area, which covers the full geographic extent of the Island of Kauai, Hawaii for 5 year permit duration

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$5,234,926	$11,000,000
Habitat Based (Creation)	-	400 acres

IV. IMPLEMENTATION METHOD: Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: NO

V. COMPENSATION DELIVERED: YES

Lower Colorado River Multi-Species Conservation Plan

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
2 & 6	Arizona California Nevada	717,814	04/04/2005	26	50	Cottonwood-willow Honey Mesquite Cattail Marsh Backwaters	Multiple	YES 10

I. KEY ISSUES

1. The Colorado River serves as a source of hydroelectric generation, water and recreational activities
2. The Colorado River provides water supply for over 25 million people and 3.5 million acres of agricultural land
3. The potential growth of hydroelectric generation and Increased development places habitats and species at risk
4. The Lower Colorado River Multi-Species Conservation Plan is the first step to ensure comprehensive conservation measures are implemented prior to renewable energy development, as well as ensure protection of water resources and recreational activities.

II. PRIMARY OBJECTIVES

1. Conserve habitat and work toward the recovery of endangered species
2. Reduce the likelihood of additional species being listed
3. Accommodate present water diversions and optimize future water and power development

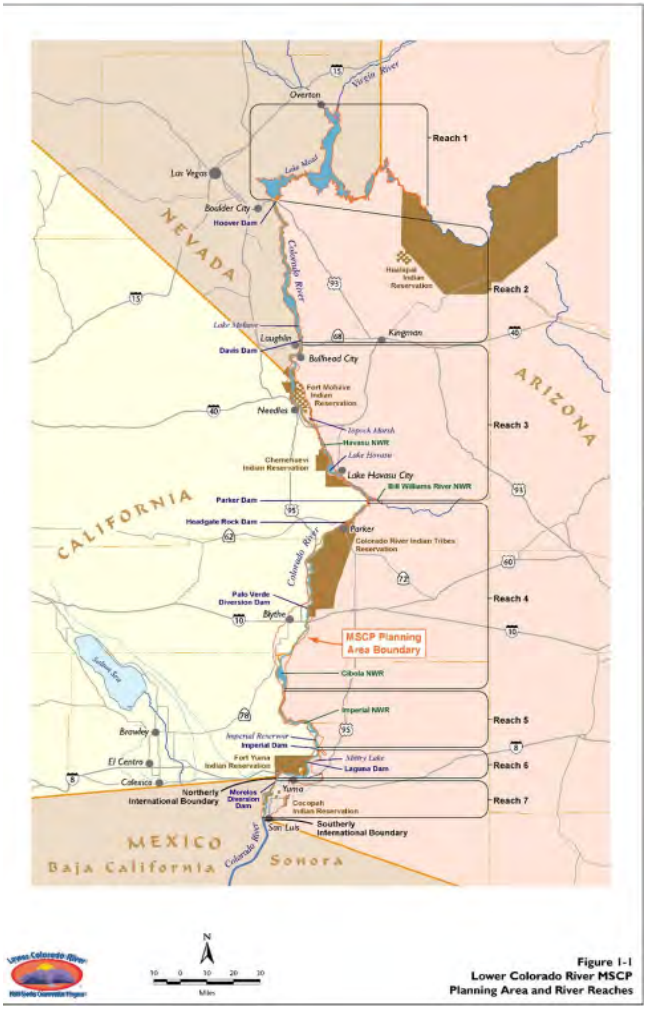


Figure I-1
Lower Colorado River MSCP Planning Area and River Reaches

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$222,732,564.04	$626,180,000
Habitat Based (Creation)	4,664	8,132

IV. IMPLEMENTATION METHOD: Permittee Responsible

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: YES

Midwest Wind Multi-Species Habitat Conservation Plan

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
3	Illinois Indiana Iowa Michigan Minnesota Ohio	TBD	TBD	6	45	Jack Pine, Ozark Plateau Streams, Bare Illuvial Islands, Dredged Spoil Islands, Beaches along Great Lakes, Alkali Lakes/Wetlands, Grasslands	Multiple	NO

I. KEY ISSUES

Challenges in receiving approvals for HCP's and wind energy development projects

II. PRIMARY OBJECTIVES

1. Provide for a more comprehensive and coordinated process and program for the avoidance, minimization and mitigation of impacts of wind energy development on the Covered Species in the Plan Area

2. Increase ESA permitting efficiency for the USFWS through reduced staff time, lower costs, and reduced paperwork coupled with an increased level of protection and conservation for Covered Species

3. Accommodate present water diversions and optimize future water and power development

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	-
Habitat Based (Creation)	-	-

IV. IMPLEMENTATION METHOD: Permittee Responsible, Third-party Conservation Bank, In-lieu Fee Model, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: N/A

NiSource Multi-Species HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
3 & 4 & 5	Delaware Indiana Kentucky Louisiana Maryland Mississippi New Jersy New York North Carolina Ohio Pennsylvania Tennessee Virginia West Virginia	9,783,207	09/13/2013	43	50	Varied, contained within a 1-miles wide linear corridor, approximately 15,500 miles in length, and comprising 9.8M acres	1	YES 1

I. KEY ISSUES

1. Numerous individual project-focused consultations is inefficient and time-consuming
2. NiSource believes that the traditional ESA consultation approach to regulatory compliance may be too limited a tool to achieve the ESA's conservation goals due to its local and project-specific focus
3. NiSource seeks to address the full range of its ongoing activities and to identify and manage species and habitat impacts on a system-wide basis

II. PRIMARY OBJECTIVES

1. The MSHCP addresses the impacts of NiSource's covered activities on 43 species and 11 take species, including 9 federally listed species
2. The MSHCP analyzes impacts to these species occurring during three general categories of activities related to NiSource's natural gas systems: (1) general operation and maintenance; (2) safety-related repairs, replacements, and maintenance; and (3) expansion

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$ 462,213	$ 40,212,346
Habitat Based (Creation)	-	-

IV. IMPLEMENTATION METHOD: Permittee Responsible, Third-party Conservation Bank

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: YES

Orange County Southern Subregion NCCP/HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
8	California	132,000	01/10/2007	34	75	Coastal sage scrub Riparian Chaparral Grrassland	Multiple	YES 1

I. KEY ISSUES

1. The continuing population growth in California will result in increasing demands for dwindling natural resources and result in the continuing decline of the state's wildlife

2. There is a need for broad-based planning to provide for effective protection and conservation of the state's wildlife heritage while continuing to allow appropriate development and growth

II. PRIMARY OBJECTIVES

1. Manage and protect habitat supporting a broad range of plant and animal populations that are now found within the Central and Coastal subregion

2. Focus on conserving natural communities rather than individual species, while providing for the protection of species listed under CESA and FESA and accommodating compatible land uses

3. Provide long-term protection for the coastal sage scrub (CSS) and non-CSS habitats within the subregion

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$2,355,000	$36,500,00
Habitat Based (Creation)	50 acres	37,378 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, In-lieu Fee Model, Other

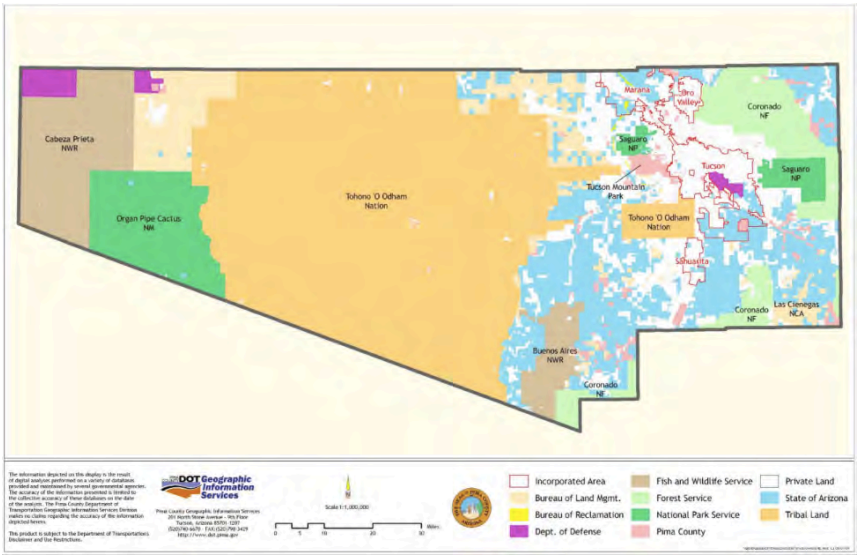
V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: YES

Pima County Multi-Species Conservation Plan, under Sonoran Desert Conservation Plan

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
2	Arizona	610,000	07/05/2016	16	30	Sonoran desert scrub, including, but not limited to, ironwood, mesquite, acacia, bursage, and saguaro cacti, xeroriparian and mesoriparian communities, grasslands	1	NO



I. KEY ISSUES

There is a need to comply with the ESA while allowing future growth of the built environment

II. PRIMARY OBJECTIVES

1. Balance the need to comply with the ESA while allowing for the future growth of the built environment

2. Avoid and minimize take where and when possible, mitigate loss of approximately 36,000 acres of Covered Species' habitat in a manner consistent with the County's CLS reserve design, manage mitigation lands to prioritize the conservation of Covered Species and their habitats, within the constraints allowed by law, enhance habitat for Covered Species, prevent landscape fragmentation, and support species establishment or recovery

3. Detect potentially harmful and ecologically significant changes early enough to implement management practices that reverse or prevent long-term degradation of Covered Species and their habitats

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	$135,000,000
Habitat Based (Creation)	116,320 acres	187,000 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Third-party Conservation Bank, In-lieu Fee Model, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: N/A

Plum Creek Native Fish HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
6	Montana	969,624	11/23/2000	4	30	Forests and riparian/aquatic	1	YES (2015 Native Fish HCP Annual Report)

I. KEY ISSUES

Bull trout and other native salmonids generally prefer habitat that consists of Cold, Clean, Complex, and Connected water (the Four Cs). These general habitat characteristics are the basis for the biological goals of the NFHCP. The general goal of these commitments is to protect the Four Cs by minimizing the impacts of Plum Creek's current forestry activities on habitat, as well as by improving habitat degraded by past practices.

II. PRIMARY OBJECTIVES

1. Provide conservation for native salmonids in the area
2. Provide certainty for Plum Creek's activities by obtaining an incidental take permit (ITP)

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	-
Habitat Based (Creation)	-	-

IV. IMPLEMENTATION METHOD: Permittee Responsible

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: N/A

San Bruno Mountain HCP

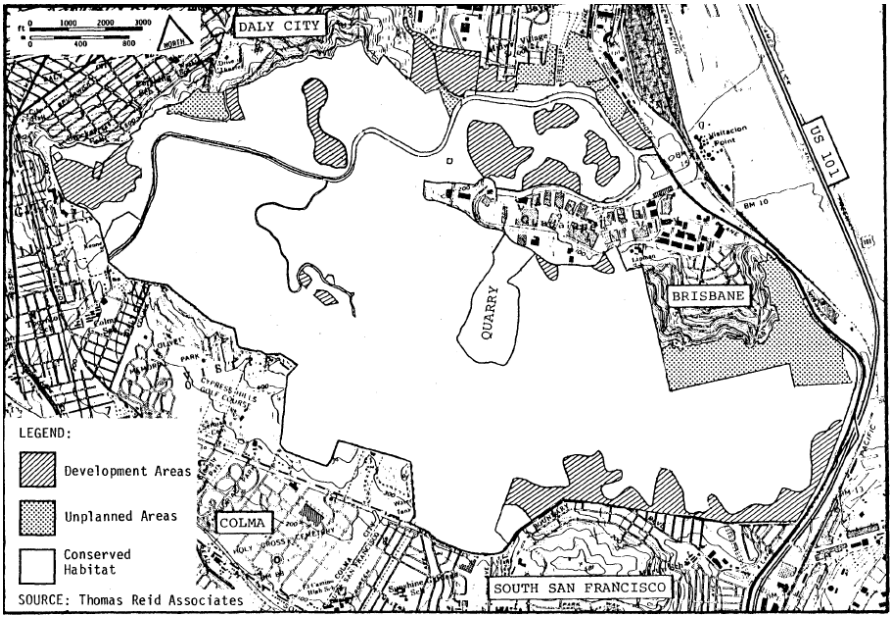
Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
8	California	3,800	04/03/1983	5	30	-	Multiple	YES 8

I. KEY ISSUES

1. Natural processes are promoting the spread of brush and exotic species (such as gorse and eucalyptus), which is reducing the density of the butterflies' host plants, therefore is slowly destroying the habitat of the endangered butterflies

2. Trespassing off-road vehicles are also damaging the host plants

3. The impasse between private landowners and the butterflies has been detrimental to both sides. The butterflies are headed toward extinction and private landowner's are unable to develop their land



II. PRIMARY OBJECTIVES

1. Provide preservation of the existing diverse ecological values. Habitat improvement is necessary both to counter balance the effect of development and to try to reverse the existing trend toward extinction

2. Address both the problem of the butterflies' potential extinction and private landowner's desire to develop their land

3. Implementation of the HCP will result in control of the natural spread of brush and exotic species, as well as protection against vandalism

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	$1,800,000
Habitat Based (Creation)	3446 acres	2,752 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

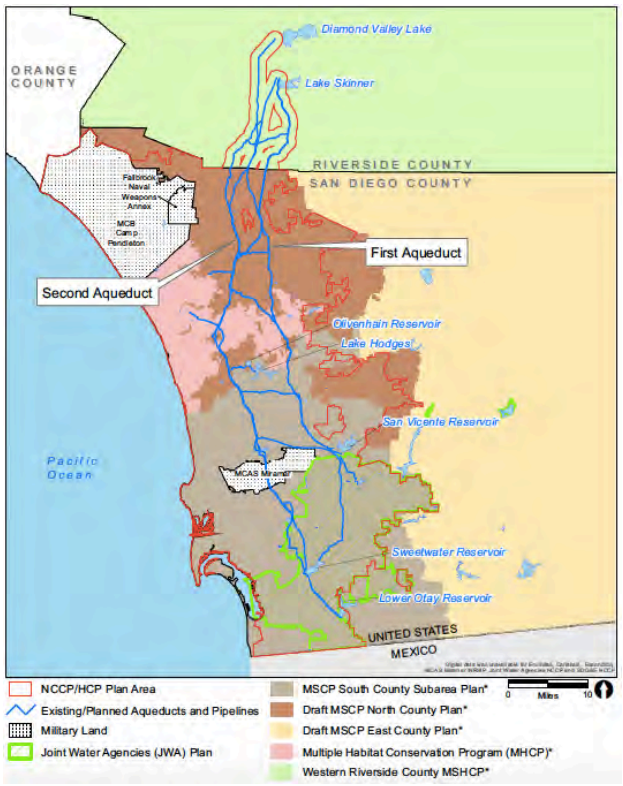
V. COMPENSATION DELIVERED: YES

San Diego County Water Authority Subregional NCCP/HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
8	California	922,000	12/30/2011	21	55	Varied—countywide	1	YES 3

I. KEY ISSUES

1. The Water Authority is an independent agency that plans, approves, constructs, operates and maintains a complex water infrastructure system. These activities, which are essential to the region's water reliability, could impact plant and animal species that are currently listed as endangered or threatened, or those that may become listed in the future
2. The process of obtaining separate permits for individual projects and activities that could have impacts on sensitive species is complex, time-consuming and costly. Having a comprehensive conservation program, and the permits that allow impacts to sensitive species, would provide the Water Authority the certainty that it can undertake activities covered by the Plan without being unduly constrained or delayed



II. PRIMARY OBJECTIVES

1. Ensure habitat and species diversity through the identification and protection of lands in Preserve Areas for the benefit of Covered Species
2. Provide and implement conservation measures that meet the environmental needs of the Covered Species, based on the best available scientific information
3. Identify and implement environmentally sensitive methods for planning, construction, and Operations & Maintenance (Covered Activities) that minimize project impacts and ensure that activities
4. Provide and implement an adaptive management program with measurable objectives for vegetation types and Covered Species, where appropriate
5. Provide and implement a monitoring and reporting process

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$23,800,000	$23,800,00
Habitat Based (Creation)	Total Initial Credits: 1,880.08 acres Total Deductions: 958.76 acres Total Available Credits: 646.35 acres	3,067 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Single-user Bank Sponsored by HCP Permittee, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: YES

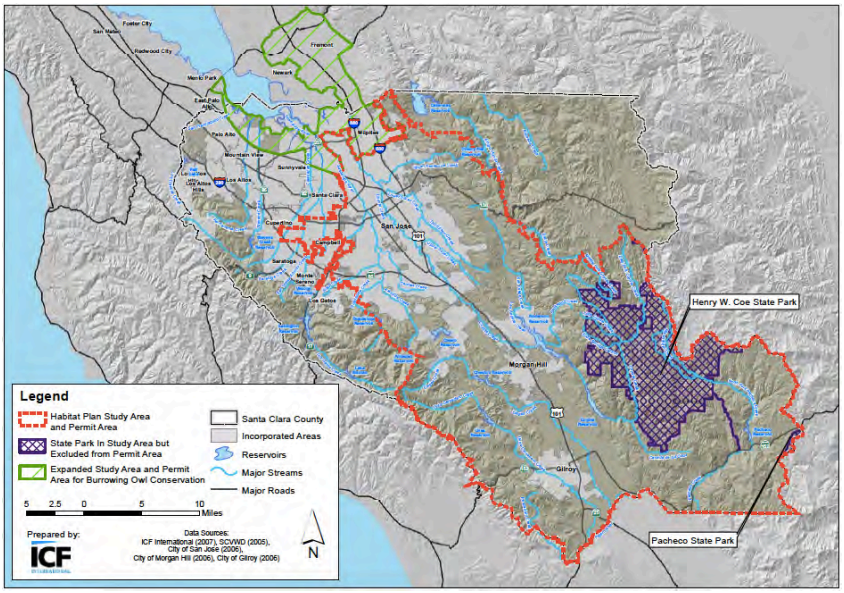
Santa Clara Valley HCP/NCCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
8	California	508669	30/07/2013	18	50	Grassland, chaparral & coastal scrub, oak woodland, riparian forest & scrub, conifer woodland, wetland, open water, agricultural, and developed	Multiple	YES 1

I. KEY ISSUES

1. The plan helps protect habitats at a larger scale but still allows urban development, capital projects, rural development and conservation strategies

2. Adaptive management strategies will protect the land and allow development to continue in a sustainable manner



II. PRIMARY OBJECTIVES

1. Provide a framework for promoting the protection and recovery of natural resources, including endangered species, while streamlining the permitting process for planned development, infrastructure, and maintenance activities

2. Allow the County of Santa Clara, the Santa Clara Valley Water District (SCVWD), the Santa Clara Valley Transportation Authority (VTA) and the cities of Gilroy, Morgan Hill, and San José (collectively, the Local Partners or Permittees) to receive endangered-species permits for activities and projects they conduct and those under their jurisdiction

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$2,104,815	$657,750,000
Habitat Based (Creation)	$80,491	520 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, In-lieu Fee Model

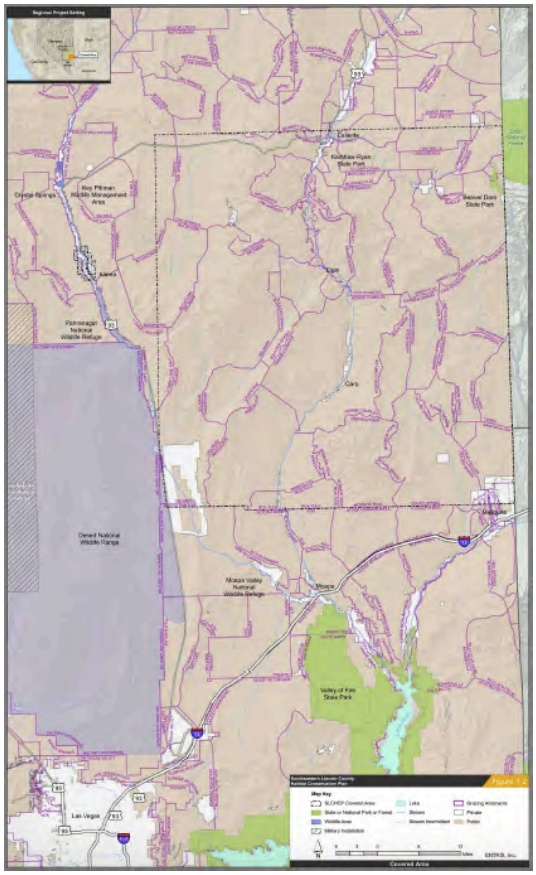
V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: YES

Southeastern Lincoln County HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
8	Nevada	1,700,000	05/05/2010	2	30	Mojave Desert scrub, blackbrush, salt desert scrub, lowland riparian associated with the Meadow Valley Wash, and agricultural areas	Multiple	NO



I. KEY ISSUES

The need to apply for separate incidental take permits are triggered by the applicants' proposal to either develop land within southeastern Lincoln County that would meet local housing needs and allow for economic development or ongoing road, railway or flood control activities

II. PRIMARY OBJECTIVES

Provide a mechanism to allow orderly growth and development in the southeastern portion of Lincoln County while providing conservation for the Covered Species to ensure that the incidental take authorized by the permits do not jeopardize the continued existence of the Covered Species or adversely modify designated critical habitat

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	$21,000,000
Habitat Based (Creation)	-	5,204 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Third-party Conservation Bank, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: N/A

Washington County HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
6	Utah	135,000	02/23/1996	1	20	Mojave desert	Multiple	YES 1

I. KEY ISSUES

1. Washington County was the fastest growing county in Utah in 1996. By 2010, there were three growth projections available for population and development. It also had habitat for nine species, threatened and endangered. Conflicts arose from development and the mojave desert tortoise to provide greater protection

2. The HCP wanted an incidental take permit only for the desert tortoise in order to continue with the development activities. All 9 listed species, at the time, were addressed in the HCP. Desert tortoise was dangerously fragmented due to urban development

II. PRIMARY OBJECTIVES

Establish a reserve for the threatened desert tortoise in the Upper Virgin River Recovery Unit in Washington County, Utah. The HCP covered take of desert tortoises from development activities in the rapidly growing city of St. George

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$11,930,404	$9,100,000
Habitat Based (Creation)	8,951 acres	520 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible

V. ADAPTIVE MANAGEMENT: NO

VI. LANDSCAPE LEVEL PLAN: NO

V. COMPENSATION DELIVERED: YES

WDNR (Washington Department of Natural Resources) Forest Lands HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
1	Washington	1,600,000	01/30/1997	52	70	Coniferous and hardwood forest lands; wetlands; aquatic and riparian habitat associated with all stream types; snags; and special habitat types	1	YES 17

I. KEY ISSUES

The DNR has an obligation to act with "undivided loyalty" to preserve the natural environment of the forests in Washington. The HCP will provide "greater certainty in management, greater stability in harvest levels, and greater flexibility in operations"

II. PRIMARY OBJECTIVES

1. Address state trust land management issues mainly in the Northern Spotted Owl habitat
2. Allow logging and other management activities to continue in Washington forests

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	-
Habitat Based (Creation)	-	-

IV. IMPLEMENTATION METHOD: Permittee Responsible, Other

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: N/A

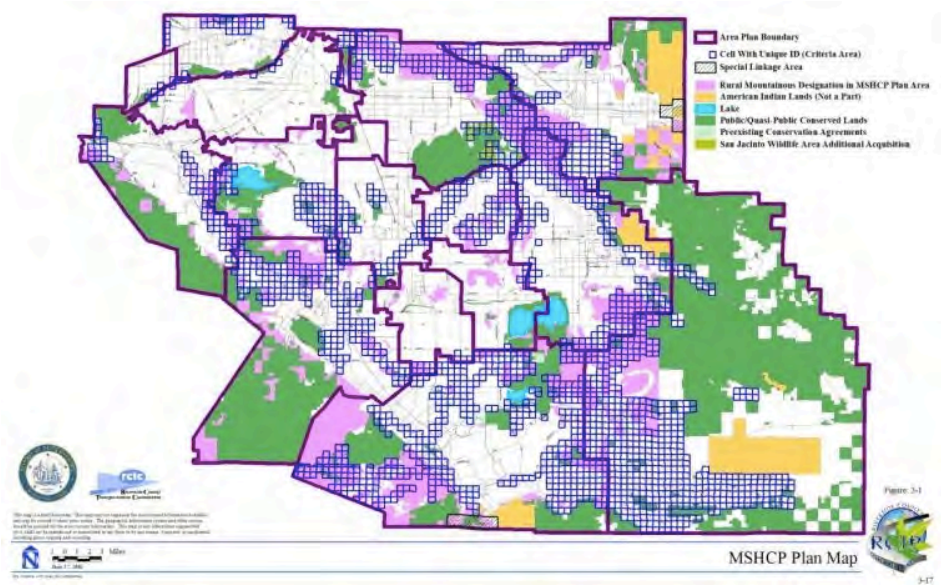
Western Riverside MSHCP (One permit w/ 22 permittees)

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
8	California	1,300,000	06/22/2004	146	75	Multiple habitats	Multiple	YES 10

I. KEY ISSUES

1. Historically, urban Development in Southern California has occurred in the coastal areas, and the burden of mitigating the effects of urbanization now falls largely on the County, the Cities and private landowners in the inland valleys and hillsides of Riverside

2. As population and urbanization has increased within the County, an increasing number of proponents of public and private Developments have been required to obtain "Take permits" from Wildlife Agencies for impacts to endangered, threatened, and rare species and their Habitats



II. PRIMARY OBJECTIVES

1. Ultimately create a 500,000-acre Reserve of protected open space within western Riverside County

2. Biological Goal: in the MSHCP Plan Area, Conserve Covered Species and their Habitats

3. Economic Goal: improve the future economic development in the County by providing an efficient, streamlined regulatory process through which Development can proceed in an efficient way

4. Social Goal: provide for permanent open space, community edges, and recreational opportunities, which contribute to maintaining the community character of Western Riverside County

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$446,007,744	$1,539,400,000
Habitat Based (Creation)	53,550 acres	153,000 acres

IV. IMPLEMENTATION METHOD: Permittee Responsible, Third-party Conservation Bank, In-lieu Fee Model

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

V. COMPENSATION DELIVERED: YES

Wisconsin Statewide Karner Blue Butterfly Habitat Conservation Plan

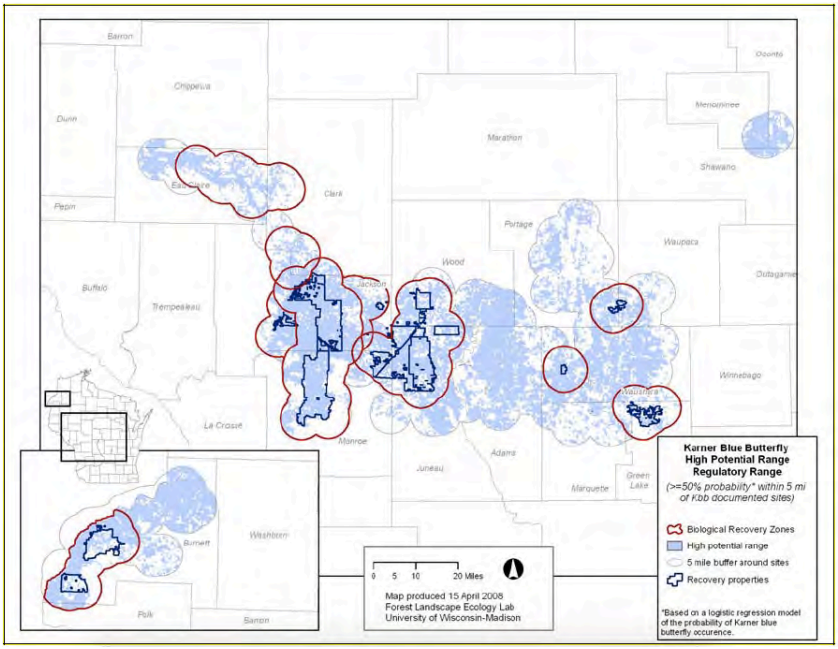
Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
3	Wisconsin	7,000,000	09/27/1999	1	20	Forest Barrens Road rights-of-way, etc.	Multiple	YES 1

I. KEY ISSUES

1. The disappearance and fragmentation of the pine and oak savanna habitats, through a variety of causes, has been a major contributor to the range-wide decline of the Karner blue butterfly

2. Natural plant succession in these habitats has eliminated Karner blue butterflies from some areas

3. The Karner blue butterfly is threatened with loss or degradation of habitat due to development, land management activities, and the lack of natural disturbance such as wildfire and grazing by large mammals. Such disturbance helps maintain the butterfly's habitat by setting back encroaching forests, and encouraging lupine and flowering plant growth



II. PRIMARY OBJECTIVES

1. Assist USFWS in the recovery of the Karner blue butterfly

2. Feature and enhace Karner blue butterfly habitat on DNR recovery properties and to implement enhanced conservation and habitat restoration practices

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	$150,000	-
Habitat Based (Creation)	-	Voluntary

IV. IMPLEMENTATION METHOD: Permittee Responsible

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: YES

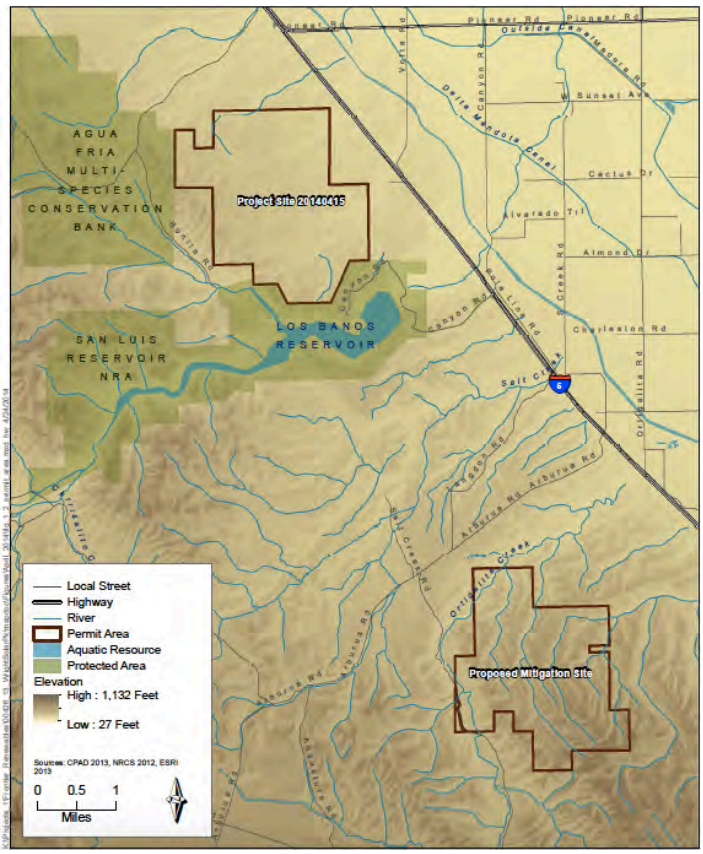
V. COMPENSATION DELIVERED: YES

Wright Solar Park HCP

Region	Location	Size (Acres)	Permit Issue Date	Covered Species	Duration (Years)	Habitat Type	Number of Applicants	Progress Reports
8	California	2,450	01/23/2015	3	35	Grassland	1	NO

I. KEY ISSUES

Implementation of the project may incrementally contribute to cumulative loss or degradation of habitat for San Joaquin kit fox, blunt-nosed leopard lizard, and California tiger salamanders. In this HCP, the cumulative effects of the plan on these species are assessed relative to past, present, and reasonably foreseeable projects in western Merced County



II. PRIMARY OBJECTIVES

1. Develop and operate a 200 megawatt (MW) ground-mounted solar photovoltaic (PV) power plant on private agricultural lands in western unincorporated Merced County, California

2. The proposed solar electrical generating facility would consist of a photovoltaic solar power system that would produce clean, renewable direct current (DC) electricity and convert it to alternating current (AC)

III. COMPENSATION

Compensation Type	Compensation to Date	Planned Compensation
Monetary	-	12,782,000
Habitat Based (Creation)	-	2,450

IV. IMPLEMENTATION METHOD: Permittee Responsible

V. ADAPTIVE MANAGEMENT: YES

VI. LANDSCAPE LEVEL PLAN: NO

V. COMPENSATION DELIVERED: N/A

APPENDIX B: PLANNED & DELIVERED COMPENSATION OF 30 HCPS

APPENDIX C: LOWER COLORADO MSCP FUNDING MATRIX

Table 1-7.—Annual Funding Matrix

Work Task	Name	FY15 Approved Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Projected Estimate[1]	FY19 Projected Estimate[1]
A	**Program Administration**							
A1	Program Administration	$1,382,444.00	$1,140,477.22	$10,995,005.59	$1,411,966.00	$1,418,074.00	$1,418,074.00	$1,418,074.00
Closed[2]	Work Tasks Pre-FY15			$130,535.22				
		$1,382,444.00	**$1,140,477.22**	**$11,125,540.81**	**$1,411,966.00**	**$1,418,074.00**	**$1,418,074.00**	**$1,418,074.00**
B	**Fish Augmentation**							
B1	Lake Mohave Razorback Sucker Larvae Collections	$200,000.00	$183,182.91	$2,158,662.37	$200,000.00	$215,000.00	$215,000.00	$215,000.00
B2	Willow Beach National Fish Hatchery	$325,000.00	$312,306.38	$3,496,327.15	$325,000.00	$325,000.00	$325,000.00	$325,000.00
B3	Achii Hanyo Native Fish Rearing Facility	$160,000.00	$174,637.87	$1,244,414.09	$275,000.00	$50,000.00	$170,000.00	$170,000.00
B4	Southwestern Native Aquatic Resources & Recovery Center at Dexter	$250,000.00	$224,440.99	$2,142,765.08	$260,000.00	$260,000.00	$260,000.00	$260,000.00
B5	Bubbling Ponds Fish Hatchery	$960,000.00	$686,937.96	$2,739,536.89	$315,000.00	$330,000.00	$330,000.00	$330,000.00
B6	Lake Mead Fish Hatchery	$255,000.00	$238,485.46	$651,098.11	$240,000.00	$325,000.00	$325,000.00	$325,000.00
B7	Lake-Side Rearing Ponds	$200,000.00	$181,782.56	$2,050,370.87	$200,000.00	$200,000.00	$200,000.00	$200,000.00
B8	Fish Tagging Equipment	$125,000.00	$115,059.95	$878,805.06	$135,000.00	$135,000.00	$135,000.00	$135,000.00
B11	Overton Wildlife Management Area	$50,000.00	$0.00	$428,954.45	$50,000.00	$0.00	$0.00	$0.00
B12	Maintenance of Alternate Bonytail Broodstock	$0.00	$0.00	$0.00	$50,000.00	$65,000.00	$65,000.00	$65,000.00
Closed[2]	Work Tasks Pre-FY15		$0.00	$558,428.94	$0.00			
		$2,525,000.00	**$2,116,834.08**	**$16,349,363.01**	**$2,050,000.00**	**$1,905,000.00**	**$2,025,000.00**	**$2,025,000.00**
C	**Species Research**							
C2	Sticky Buckwheat and Threecorner Milkvetch Conservation	$11,000.00	$10,673.49	$115,851.18	$11,000.00	$11,000.00	$11,000.00	$11,000.00

Annual Funding Matrix 1/6

Table 1-7.—Annual Funding Matrix

Work Task	Name	FY15 Approved Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Projected Estimate[1]	FY19 Projected Estimate[1]
C3	Lower Colorado River Multi-Species Conservation Program Covered Species Profile Development	$10,000.00	$466.27	$278,663.86	$0.00	$0.00	$0.00	$0.00
C4	Relict Leopard Frog	$11,000.00	$10,843.67	$114,832.84	$0.00	$0.00	$0.00	$0.00
C13	Lake Mead Razorback Sucker Study	$135,000.00	$135,241.40	$1,695,608.41	$0.00	$0.00	$0.00	$0.00
C14	Humpback Chub Program Support	$57,000.00	$87.21	$287,987.11	$57,000.00	$57,000.00	$57,000.00	$57,000.00
C24	Avian Species Habitat Requirements	$310,000.00	$161,927.64	$1,707,382.89	$270,000.00	$340,000.00	$150,000.00	$0.00
C25	Imperial Ponds Native Fish Research	$200,000.00	$184,143.25	$1,644,441.56	$200,000.00	$200,000.00	$200,000.00	$0.00
C27	Small Mammal Population Studies	$50,000.00	$39,005.31	$438,705.18	$40,000.00	$0.00	$0.00	$0.00
C31	Razorback Sucker Genetic Diversity Assessment	$140,000.00	$141,928.74	$650,031.33	$160,000.00	$160,000.00	$160,000.00	$0.00
C32	Determination of Salinity, Temperature, pH, and Oxygen Limits for Bonytail and Razorback Suckers	$115,000.00	$96,353.36	$690,956.97	$110,000.00	$110,000.00	$0.00	$0.00
C40	Genetic and Demographic Studies to Guide Conversation Management of Razorback Suckers and Bonytail in Off-Channel Habitats	$190,000.00	$186,066.42	$760,448.36	$275,000.00	$300,000.00	$300,000.00	$0.00
C43	Population Demographics and Habitat Use of the California Leaf-Nosed Bat, a Genetic Evaluation	$25,000.00	$24,984.19	$110,099.63	$40,000.00	$0.00	$0.00	$0.00
C52	Gilded Flicker Riparian Habitat Use and Seasonal Movement Research	$160,000.00	$107,103.99	$513,269.60	$300,000.00	$300,000.00	$0.00	$0.00
C53	Sonic Telemetry of Juvenile Flannelmouth Suckers in Reach 3	$120,000.00	$117,133.38	$410,889.16	$120,000.00	$100,000.00	$100,000.00	$0.00
C57	Sonic Telemetry of Lake Mead Juvenile Razorback Suckers	$250,000.00	$226,958.99	$541,878.93	$0.00	$0.00	$0.00	$0.00
C59	Selenium Monitoring in Created Backwater and Marsh Habitats	$250,000.00	$65,217.24	$110,385.45	$200,000.00	$160,000.00	$160,000.00	$160,000.00
C60	Habitat Manipulation	$100,000.00	$74,319.36	$120,067.55	$225,000.00	$175,000.00	$175,000.00	$175,000.00

Annual Funding Matrix 2/6

Table 1-7.—Annual Funding Matrix

Work Task	Name	FY15 Approved Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Projected Estimate[1]	FY19 Projected Estimate[1]
C61	Evaluation of Alternative Stocking Methods for Fish Augmentation	$425,000.00	$188,348.83	$209,893.35	$200,000.00	$300,000.00	$300,000.00	$0.00
C62	Lowland Leopard Frog and Colorado River Toad Habitat and Ecology Study	$180,000.00	$175,622.04	$251,387.83	$150,000.00	$25,000.00	$0.00	$0.00
C63	Evaluation of Habitat Features that May Influence Success of Razorback Suckers and Bonytail in Backwater Environments	$125,000.00	$102,751.51	$102,751.51	$135,000.00	$150,000.00	$150,000.00	$0.00
C64	Post-Stocking Movement, Distribution, and Habitat Use of Razorback Suckers and Bonytail	$700,000.00	$686,445.37	$502,874.59	$700,000.00	$750,000.00	$750,000.00	$750,000.00
C65	Evaluation of Immediate Post-Stocking Survival of Razorback Suckers and Bonytail	$60,000.00	$20,738.26	$20,738.26	$120,000.00	$120,000.00	$120,000.00	$0.00
C66	Marsh Bird Water Depth Analysis	$0.00	$0.00	$0.00	$100,000.00	$100,000.00	$20,000.00	$0.00
Closed[2]	Work Tasks Pre-FY15		$363.84	$13,150,900.59				
		$3,624,000.00	**$2,756,723.76**	**$24,430,046.14**	**$3,413,000.00**	**$3,358,000.00**	**$2,653,000.00**	**$1,153,000.00**
D	**System Monitoring**							
D1	Marsh Bird Surveys	$25,000.00	$38,402.79	$290,472.87	$40,000.00	$40,000.00	$40,000.00	$40,000.00
D2	Southwestern Willow Flycatcher Presence/Absence Surveys	$675,000.00	$848,055.38	$7,621,908.70	$750,000.00	$750,000.00	$750,000.00	$750,000.00
D5	Monitoring Avian Productivity and Survivorship	$250,000.00	$300,836.44	$2,851,772.52	$250,000.00	$250,000.00	$250,000.00	$250,000.00
D6	System Monitoring for Riparian Obligate Avian Species	$480,000.00	$368,062.30	$2,316,765.90	$150,000.00	$480,000.00	$480,000.00	$480,000.00
D7	Yellow-Billed Cuckoo Presence/Absence Surveys	$750,000.00	$832,589.27	$5,328,636.18	$750,000.00	$650,000.00	$650,000.00	$650,000.00
D8	Razorback Sucker and Bonytail Stock Assessment	$850,000.00	$846,376.22	$5,723,554.08	$925,000.00	$925,000.00	$925,000.00	$925,000.00

Annual Funding Matrix 3/6

Table 1-7.—Annual Funding Matrix

Work Task	Name	FY15 Approved Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Projected Estimate[1]	FY19 Projected Estimate[1]
D9	System Monitoring and Research of Covered Bat Species	$380,000.00	$404,116.29	$1,670,233.47	$390,000.00	$140,000.00	$140,000.00	$140,000.00
D10	System Monitoring of Rodent Populations	$40,000.00	$37,704.76	$212,226.74	$40,000.00	$40,000.00	$40,000.00	$40,000.00
D12	Lowland Leopard Frog and Colorado River Toad Surveys	$25,000.00	$16,710.85	$437,414.37	$35,000.00	$35,000.00	$0.00	$0.00
Closed[2]	Work Tasks Pre-FY15			$1,298,090.77				
		$3,475,000.00	**$3,692,854.30**	**$27,751,075.60**	**$3,330,000.00**	**$3,310,000.00**	**$3,275,000.00**	**$3,275,000.00**
E	**Conservation Area Development and Management**							
E1	Beal Lake Conservation Area	$300,000.00	$280,221.40	$3,987,475.52	$400,000.00	$250,000.00	$1,300,000.00	$250,000.00
E4	Palo Verde Ecological Reserve	$500,000.00	$822,212.91	$9,320,891.26	$500,000.00	$600,000.00	$600,000.00	$600,000.00
E5	Cibola Valley Conservation Area	$700,000.00	$722,727.85	$11,351,713.78	$750,000.00	$800,000.00	$850,000.00	$850,000.00
E9	Hart Mine Marsh	$250,000.00	$204,369.70	$6,822,956.73	$250,000.00	$250,000.00	$250,000.00	$200,000.00
E13	McAllister Lake	$0.00	$0.00	$127,336.82	$0.00	$50,000.00	$400,000.00	$400,000.00
E14	Imperial Ponds Conservation Area	$800,000.00	$328,870.83	$9,669,214.32	$1,500,000.00	$1,450,000.00	$450,000.00	$350,000.00
E16	Conservation Area Site Selection	$500,000.00	$539,525.37	$2,954,318.83	$1,300,000.00	$700,000.00	$500,000.00	$400,000.00
E17	Topock Marsh Pumping	$1,000.00	$1,450.25	$1,140,618.66	$1,000.00	$1,000.00	$1,000.00	$1,000.00
E18	Law Enforcement and Fire Suppression	$200,000.00	$226,303.00	$1,608,764.76	$250,000.00	$250,000.00	$250,000.00	$250,000.00
E21	Planet Ranch	$40,000.00	$78,302.48	$344,212.22	$10,340,000.00	$2,000,000.00	$3,000,000.00	$4,000,000.00
E24	Cibola National Wildlife Refuge Unit #1 Conservation Area	$1,000,000.00	$655,451.78	$4,479,008.26	$700,000.00	$750,000.00	$750,000.00	$800,000.00
E25	Big Bend Conservation Area	$30,000.00	$24,878.09	$1,189,268.20	$30,000.00	$30,000.00	$30,000.00	$30,000.00
E27	Laguna Division Conservation Area	$3,000,000.00	$1,759,859.79	$26,254,555.45	$900,000.00	$200,000.00	$200,000.00	$100,000.00
E28	Yuma East Wetlands	$600,000.00	$467,563.97	$1,695,711.26	$1,200,000.00	$450,000.00	$400,000.00	$400,000.00
E31	Hunters Hole	$80,000.00	$112,273.39	$440,441.26	$65,000.00	$60,000.00	$60,000.00	$60,000.00

Annual Funding Matrix 4/6

Table 1-7.—Annual Funding Matrix

Work Task	Name	FY15 Approved Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Projected Estimate[1]	FY19 Projected Estimate[1]
E33	Pretty Water Conservation Area	$700,000.00	$970,299.11	$1,268,018.44	$450,000.00	$150,000.00	$50,000.00	$40,000.00
E34	Salinity and Soil Moisture Monitoring Network	$150,000.00	$51,701.73	$133,159.02	$500,000.00	$0.00	$0.00	$0.00
E35	Mohave Valley Conservation Area	$500,000.00	$460,588.99	$324,968.99	$1,250,000.00	$5,500,000.00	$500,000.00	$160,000.00
E36	Parker Dam Camp	$0.00	$0.00	$0.00	$0.00	$100,000.00	$50,000.00	$20,000.00
E37	Palo Verde Ecological Reserve-South	$0.00	$0.00	$0.00	$0.00	$200,000.00	$1,000,000.00	$1,000,000.00
E38	Three Fingers Lake	$0.00	$0.00	$0.00	$0.00	$200,000.00	$4,000,000.00	$3,000,000.00
Closed[2]	Work Tasks Pre-FY15			$5,274,791.93				
		$9,351,000.00	**$7,706,600.64**	**$88,387,425.71**	**$20,386,000.00**	**$13,991,000.00**	**$14,641,000.00**	**$12,911,000.00**
F	**Post-Development Monitoring**							
F1	Habitat Monitoring at Conservation Areas	$650,000.00	$490,889.62	$4,279,379.33	$450,000.00	$950,000.00	$850,000.00	$850,000.00
F2	Avian Use of Conservation Areas	$220,000.00	$134,175.16	$1,647,971.06	$220,000.00	$350,000.00	$350,000.00	$350,000.00
F3	Small Mammal Colonization of Conservation Areas	$55,000.00	$52,897.74	$425,887.03	$65,000.00	$65,000.00	$65,000.00	$65,000.00
F4	Covered Bat Species Monitoring at Conservation Areas	$135,000.00	$141,235.70	$1,053,800.76	$150,000.00	$150,000.00	$150,000.00	$150,000.00
F5	Post-Development Monitoring of Fish at Conservation Areas	$265,000.00	$235,350.31	$1,521,894.58	$250,000.00	$250,000.00	$350,000.00	$350,000.00
F6	Post-Development Monitoring of MacNeill's Sootywings at Conservation Areas	$80,000.00	$71,572.40	$447,717.42	$80,000.00	$80,000.00	$80,000.00	$80,000.00
F7	Marsh Bird Monitoring at Conservation Areas	$30,000.00	$29,091.63	$78,366.68	$30,000.00	$40,000.00	$40,000.00	$40,000.00
		$1,435,000.00	**$1,155,212.56**	**$9,455,016.86**	**$1,245,000.00**	**$1,885,000.00**	**$1,885,000.00**	**$1,885,000.00**

Annual Funding Matrix 5/6

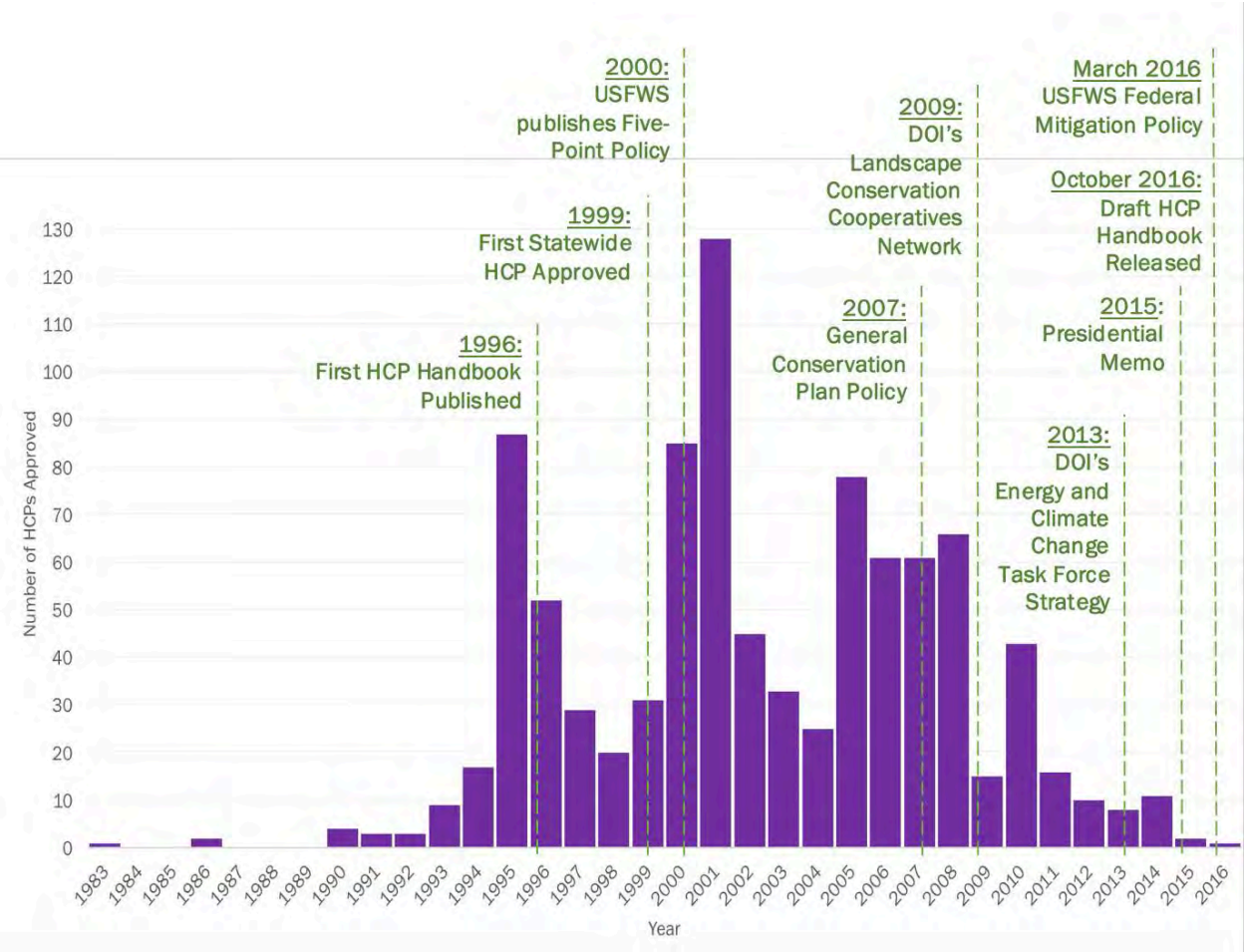
Table 1-7.—Annual Funding Matrix

Work Task	Name	FY15 Approved Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Projected Estimate[1]	FY19 Projected Estimate[1]
G	**Adaptive Management Program**							
G1	Data Management	$850,000.00	$572,953.39	$4,560,746.11	$1,000,000.00	$1,000,000.00	$1,000,000.00	$1,000,000.00
G3	Adaptive Management Research Projects	$300,000.00	$133,374.64	$2,469,533.27	$300,000.00	$300,000.00	$300,000.00	$300,000.00
G4	Science/Adaptive Management Strategy	$400,000.00	$212,457.02	$1,137,386.64	$600,000.00	$400,000.00	$400,000.00	$400,000.00
G6	Conceptual Ecological Models	$0.00	$0.00	$0.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00
		$1,550,000.00	**$918,785.05**	**$8,167,666.02**	**$1,940,000.00**	**$1,740,000.00**	**$1,740,000.00**	**$1,740,000.00**
H	**Funding Accounts**							
H1[3]	Habitat Maintenance Fund	$4,848,060.00	$5,480,049.36	$32,466,770.00	$0.00	$0.00	$0.00	$0.00
H2[3]	Remedial Measures Fund	$361,228.00	$1,562,029.94	$3,994,595.38	$1,104,052.00	$1,108,828.00	$1,108,828.00	$1,108,828.00
		$5,209,288.00	**$7,042,079.30**	**$36,461,365.38**	**$1,104,052.00**	**$1,108,828.00**	**$1,108,828.00**	**$1,108,828.00**
I	**Public Outreach**							
I1	Public Outreach	$100,000.00	$98,604.57	$509,004.93	$100,000.00	$125,000.00	$125,000.00	$125,000.00
Closed[2]	Work Tasks Pre-FY15			$61,059.68				
		$100,000.00	**$98,604.57**	**$570,064.61**	**$100,000.00**	**$125,000.00**	**$125,000.00**	**$125,000.00**
	Program Total:	**$28,651,732.00**	**$26,628,171.48**	**$222,697,564.14**	**$34,980,018.00**	**$28,840,902.00**	**$28,870,902.00**	**$25,640,902.00**

[1] FY17 and FY18 numbers are not adjusted for inflation.
[2] Closed work tasks are shown in appendix D-4.
[3] H1 and H2 cumulative expenditures through FY15 do not include interest.

Annual Funding Matrix 6/6

APPENDIX D: HCP POLICY TIMELINE



HCPs approved per year plotted against important HCP policies and events

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	HCP Planned Compensatory Mitigation				Compensatory Mitigation Delivered as of Most Recent Progress Report																	
						Habitat-based				Non Habitat-based **												
PLAN NAME	Plan Term	Current Plan Year (2016)	HCP Budget	Land Acquisition Target (acres)	Total Monetary Compensation *	Land Acquisition: Acres	Land Acquisition: Funding Spent $	Habitat Restoration: Acres	Habitat Restoration: Funding Spent $	Administration/Operations: Spending	Monitoring: Spending	Monitoring: Activities	Education: Spending	Education: Activities	Research: Spending	Species Management: Spending	Species Management: Description	Other: Spending	Other:Description	Does HCP Require Compensation Before Start of Project?	Was Compensation Implemented Before Start of Project?	Was Compensation Delivered in Priority Areas Under a Landscape Level Approach?
Balcones Canyonlands (BCCP)	30	20	$159,000,000	30,428	$81,222,130	31,785	-	-	-	-	-	-	-	-	-	-	-	-	No	-	N/A
Big Pine Key Deer	17	10	$11,700,000	500	-	Approx. 670 acres	-	-	-	-	-	Deer mortality count, deer population count	-	-	-	-	Invasive plant removal	-	-	Yes	No	No
City of Palm Bay	20	9	$10,800,000	0	$686,537	-	-	-	-	-	-	-	-	Educational pamphlets on species	-	-	-	-	-	Yes	Yes	N/A
Clark County Multiple Species HCP	30	15	$106,000,000	0	$123,000,000	145,000	-	NA	-	$23,370,000	Yes	-	$4,920,000	-	Yes	-	-	-	Tortoise fencing, management of water rights	No	-	Yes
Coachella Valley Multi-Species HCP	75	8	$2,040,000,000	115,140	$11,800,000	8,198	-	-	-	-	$336,473	-	-	-	-	-	-	-	Removal of waste and installing fencing	No	-	Yes
East Contra Costa County HCP/NCCP	30	9	$325,000,000	30,300	$61,773,800	12,283	-	15.66	-	Yes	Yes	-	-	-	Yes	-	-	-	-	Yes	Yes	Yes
Edwards Aquifer Authority Recovery Implementation Program	15	3	$261,900,000	0	$30,105,720	NA	-	-	$1,760,151	$2,090,578	$2,231,947	-	$18,698	-	$2,111,498	$2,442,104	-	$19,450,744	$1,760,151	No	-	N/A
Escambia County Beaches	30	2	$24,000,000	240	$246,225	24.46	-	-	-	-	-	Population count	-	-	-	-	Predator control	-	Wildlife-friendly lighting	Yes	-	Yes
Indian River County Sea Turtle	30	12	$13,200,000	110	-	110	-	-	-	-	-	Population monitoring	-	Education & Outreach	-	-	Nest marking	-	Light management	Yes	Yes	No
Indian River/Sebastian Areawide	30	16	$0	331	-	330.5	-	330.5	-	-	-	Yes	-	-	-	-	Invasive plant species control	-	Pine thinning and prescribed fire treatment	Yes	Yes	Yes
Kauai Island Utility Cooperative (KIUC)	5	5	$11,000,000	400	$5,234,926	-	-	-	-	-	-	Population monitoring	-	-	-	-	Predator control	-	Bird-friendly lighting	Yes	Yes	No
Lower Colorado River MSCP	50	11	$626,200,000	8,132	$222,732,564	4,664	$19,600,000	-	-	$11,125,541	$37,196,092	-	$570,065	-	$24,430,046	$16,349,363.01	-	$44,529,031	-	No	-	No
NiSource MSHCP	50	3	$28,600,000	-	$462,213	-	-	-	-	-	-	Yes	-	-	-	-	-	-	-	Yes	Yes	Yes
Orange County Southern Subregion NCCP/HCP	75	9	$36,500,000	37,378	$2,355,000	50.4	-	-	$1,515	$45,000	$260,000	-		-	$120,000	$250,000	-	$165,000	-	No	-	Yes
Pima County Multi-Species Conservation Plan, under Sonoran Desert Conservation Plan	30	0	$172,700,000	116,320		116,320	-	-	-	-	-	-	-	-	-	-	-	-	-	Yes	No	Yes
San Bruno Mountain	30	Complete	$1,800,000	2,752	-	3446	-	Approx. 100	-	-	-	Butterfly species monitoring	N/A	-	N/A	-	Invasive plant control	-	-	Yes	No	N/A
San Diego County Water Authority Subregional NCCP/HCP	55	5	$23,800,000	3,067	$468,505	3067	-	-	$59,167	-	-	-	-	-	-	-	-	-	-	Yes	Yes	Yes
Southeastern Lincoln County HCP	30	6	$20,700,000	5,120	N/A	N/A	-	N/A	-	N/A	N/A	-	N/A	-	N/A	-	N/A	-	N/A	Yes	-	N/A
Washington County	20	20	$11,600,000	7,618	$11,930 ,404	8,951	-	-	-	$123,283	$64,218	-	$23,773	-	$95,964	$138,335	-	-	-	No	-	N/A
Western Riverside MSHCP	75	12	$1,539,400,000	153,000	$446,007,744	53,550	$446,007,744	Yes	-	$36,794,074	$10,339,891	-	-	-	-	-	Protect raptor nests	-	Control unauthorized access	No	-	No
Wisconsin Statewide Karner Blue Butterfly Habitat Conservation Plan	20	17	$0	Voluntary	$150,000	0	-	-	$46,400	-	-	-	-	-	-	-	Yes	-	-	No	-	N/A

N/A = This information is not applicable for the HCP. The HCP may not have compensatory mitigation or implementation may

"-" = Information not found

*Note: Due to a lack of reporting the total monetary value of the habitat and non-habitat compensation may not add up to the

**Descriptions of non-habitat based mitigation are in place of located monetary amounts.

The following plans have not begun implementation:

Buckeye Wind/Ever Power HCP	30	3	$11,700,000	217	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	-	N/A
Midwest Wind Multi-Species Habitat Conservation Plan (Plan approved but has not started)	45	-	*TBD*	*TBD*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	-	N/A
Wright Solar Park HCP (Plan approved but has not started)	35	-	$12,884,960	2,450	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	-	N/A

The following plans do not have compensatory mitigation:

Plum Creek Native Fish	30	16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	-	N/A
WDNR Forest Lands HCP	70	19	$0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	-	N/A

Progress reports were unavailable for the following reports:

Hays County Regional HCP	30	4	$182,600,000	12,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N/A
Santa Clara Valley	50	3	$658,000,000	46,920	$2,104,815	-	$80,491	-	$64,898	$1,793,602	$7,205	-	-	-	-	$158,619	-	-	-	No	-	N/A
Charlotte County Capital Improvement Projects	30	8	$38,373,600	1,336	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	N/A

Compensation will not begin until year 10

Fowler Ridge Wind Farm	21	2	$4,922,180	120	-	-	-	-	-	-	-	Bat carcass count	-	-	-	-	-	-	Bat Gate	No	-	N/A