DRAFT

Sonoran Desert Conservation Plan

PYGMY-OWL CONSERVATION & RECOVERY BANK

A Global Mitigation Strategy for Northwest Tucson

• March 2001 •

Pima County, Arizona
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County Administrator
Chuck Huckelberry

MEMORANDUM

Date: March 19, 2001

To: The Honorable Chair and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

Re: **Pygmy-Owl Conservation and Global Mitigation Strategy for Northwest Tucson**

Background

Four years ago this month, the pygmy-owl was listed as endangered. The attached study entitled *Pygmy-Owl Conservation and Global Mitigation Strategy for Northwest Tucson* provides a brief review of the rules, listing history, and biological issues relevant to the status and protection of the pygmy-owl in Pima County. Land use in unincorporated northwest Pima County is analyzed to determine existing commitments and conservation opportunities, and in order to begin to answer the question of whether a general biological goal of conserving 80 percent of the pygmy-owl's habitat in the unincorporated areas of northwest Pima County can be achieved.

According to the existing data reflecting the built and zoned land uses within the area designated as Critical Habitat in unincorporated northwest Pima County (not including State Land):

- Pima County Government has conservation opportunities across 74 percent or less of the landscape, but only if the large lot built environment is included and actually is effective in the conservation of the pygmy-owl;

- 26 percent or more of unincorporated Pima County is unlikely to contribute to pygmy-owl conservation.

Landowner cooperation and a comprehensive, principled mitigation strategy will be necessary to achieve significant habitat conservation. Nine standards are recommended for consideration in endangered species mitigation and recovery banking, based on the work by the Environmental Defense Fund.

A "Draft Policy on the Establishment, Use and Operation of Mitigation Banks under the Endangered Species Act" and a "Model Endangered Species Mitigation Banking Agreement" are attached for future development and discussion.

Review of the Rules and Listing History of the Pygmy-Owl

In 1997, when the pygmy-owl was listed as endangered, there were 12 known owls. Today, there are not many more in Pima County. In the listing document, the Service outlined a number of threats to the continued existence of pygmy-owls, including habitat loss and low genetic variation. The attached report describes how four years after the listing, the overall population of owls has not increased in any way that indicates improved conditions, the cumulative impacts of development greatly exceed the five housing and development projects known to the Service at the time of the listing, and the outlook for genetic fitness of owls in northwest Tucson is potentially dimmer than it was at the time of the listing.

Existing Commitments and Conservation Opportunities

The United States Fish and Wildlife Service has negotiated a few mitigation agreements during the course of federal consultations, relying on biologists estimates of how much ground disturbance pygmy-owls can tolerate. By measuring the actual level of disturbance that exists in the home range (280 acres) surrounding nest sites or activity centers, it was found, on average, that the percent disturbance in home ranges was approximately 20 percent. Applying this as the best information available, the Service generally limits ground disturbance for proposed projects in northwest Tucson to about 20 percent of the project area. When such is not possible on site, suitable habitat that is sufficiently near the site might be conserved in an amount that leads to an overall conservation achievement of 80 percent.

In asking the question of whether a general biological goal of conserving 80 percent of the pygmy-owl's habitat in the unincorporated northwest side can be achieved, a land analysis was conducted for five categories of use: (1) built; (2) public but not protected; (3) zoned for more than SR; (4) rural (3.3 to 200 acre parcels); and (5) land within a reserve. An analysis of the potential habitat impacts of Pima County's capital improvement projects was also undertaken.

Landowner Incentives

In the unincorporated Critical Habitat area of northwest Pima County (not including State Land), less than half of the land is currently built. Of the built land in Critical Habitat, 68 percent is large lot -- 3.3 acres or larger. Just over 10 percent of unbuilt land is zoned at intensities greater than large lot. The market for rural residential land is very strong in the area. There is some support for the idea that pygmy-owls can be conserved in the large lot environment, but an effective reserve will not be constructed without a great deal of information exchange between landowners and biologists, and a global approach to assembling corridors and patches of protected habitat within this environment. A combination of landowner initiative and government partnerships working to achieve an effective reserve in the area will be required.

In Lee County, Florida, the Land Development Code provides for the protection of the habitat of the Southern Bald Eagle, offering regulatory and financial incentives to landowners who contribute to the goal of maintaining the population. This is one model that rewards landowners for pursuing conservation alternatives in their land use.

Residents in the unincorporated area of northwest Pima County have demonstrated interest, and in many cases, strong support for pygmy-owl protection, making landowner participation a potentially workable strategy.

Principled Approach to Mitigation

Mitigating on a project-by-project level is not likely to achieve this overall habitat goal, either numerically, or from the standpoint of assembling a reserve that functions and achieves pygmy-owl conservation and recovery. In order to suggest principles for creating a reserve that more nearly approaches the biologists' goal, the attached study cites work by the Environmental Defense Fund on mitigation banking under the Endangered Species Act. The important role of landowner incentives is also discussed.

Nine Standards Recommended for Endangered Species Mitigation and Recovery Banking

Pointing out that there are differences between wetlands and endangered species that should lead to a different type of mitigation guidance and policy, the following standards are discussed, based on a proposal authored by the Environmental Defense Fund.

1. Endangered species mitigation banking should reward preservation in addition to restoration and habitat creation. The reasons for this include that preserving currently suitable but unoccupied habitat will make it more likely that the endangered animal will recover. Further, when active management is required for recovery, this too should be rewarded in a mitigation bank. Current landowners who have land that is suitable or critical for an endangered animal may become part of the bank by committing to preservation and engaging in some form of active management.

2. Endangered species mitigation banking should determine "service areas" or recovery units in light of recovery plans.

3. Endangered species mitigation banking should determine the credits and debits for mitigation banking according to the various needs of the listed species being protected.

4. Endangered species mitigation banking should be allowed to occur on local government land if credits are based on those values that are supplemental to the public program that is in place.

5. Endangered species mitigation banking should attempt to secure conservation lands to the maximum degree in advance of allowing impacts, but a program should structure the sale of credits so as to create incentives for those who buy into the bank.

6. Endangered species mitigation banking should remain adaptive to the status of the species.

7. Endangered species mitigation banking should include areas that are not currently occupied as part of the overall reserve design in order to improve the status quo and actually move toward recovery of the listed species.

8. Endangered species mitigation banking should be built according to the needs of the species of concern, and strategies about on-site mitigation or consolidated banking should be made accordingly.

9. Endangered species mitigation banking should encourage public and private bank formation and landowner incentives.

Conclusion

When the pygmy-owl was listed as endangered in 1997, the Service cited three major factors that led to listing: (1) The present or threatened destruction, modification, or curtailment of the species habitat or range; (2) the inadequacy of existing regulatory mechanisms; and (3) man made factors affecting continued existence, such as isolated populations leading to low levels of genetic variation. According to federal Guidelines, delisting or downlisting will require recovery, which entails a demonstration that the decline of the species is arrested or reversed, and threats to its survival are neutralized in a manner that ensures long term survival.

This study looks only at unincorporated Pima County. In aggregate more progress toward recovery needs to be made. The land use analysis in the attached study indicates that such potential may be difficult on the northwest side of Pima County, however by implementing a comprehensive mitigation strategy improved progress can be made.

In the next 30 to 60 days, I will work with landowners, stakeholders and interested federal and local jurisdictions to draft a mitigation policy proposal for Board consideration, and a model agreement for mitigation banking on the northwest side. A global and principled mitigation strategy will be proposed so that the goals of the biologists can be more nearly approached.

Attachments

PYGMY-OWL CONSERVATION AND GLOBAL MITIGATION STRATEGY FOR NORTHWEST TUCSON

Pygmy-Owl Conservation and Global Mitigation Strategy for Northwest Tucson

I. Background

During the next 21 months, Pima County will complete the Sonoran Desert Conservation and Comprehensive Land Use Plan and receive a permit from the United States Fish and Wildlife Service under Section 10 of the Endangered Species Act that will allow us to implement a regional program to protect imperiled species and provide certainty and regulatory assurances to landowners and local governments. The Sonoran Desert Conservation Plan has proposed innovative approaches to multi-species conservation planning, including:

- A commitment to a biological standard that ensures the long-term survival of the full spectrum of plants and animals that are indigenous to Pima County, including a commitment to implementing the recovery plan for the pygmy-owl;
- Development of a native aquatic species reintroduction program;
- Development of a native plant nursery at our Wastewater treatment plants;
- Establishment of a mitigation bank for a listed cactus;
- Development of a series of riparian restoration and revegetation projects with federal agencies to implement the Sonoran Desert Conservation Plan;
- Creation of an adaptive management plan in partnership with federal land managers, including on-going discussions about the potential for joint planning with the Bureau of Land Management for the newly designated Ironwood Forest National Monument; and
- An integrated approach toward meeting the goals of the Endangered Species Act and the Clean Water Act, including working with federal agencies to have a unified standard for permitting that has the result of protecting aquatic and riparian habitat at the watershed / system level.

This study brings focus to the short and long term need for a pygmy-owl conservation and recovery bank for Northwest Tucson. The report reviews issues related to the listing of the pygmy-owl and recovery issues in the area, and it proposes a principled approach to conservation and mitigation banking in order to create options to pursue a global mitigation strategy for Northwest Tucson.

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II. Brief Review of the Rules Related to the Listing of the Pygmy-Owl

1. Prohibition on "take": Under Section 9 of the Endangered Species Act, any action by any person subject to the jurisdiction of the United States may not "take" (hurt, harm, harass or significantly alter the habitat of) an endangered animal. When the pygmy-owl was listed as endangered in March of 1997, the listing document enumerated activities that the Service believed could potentially harm, harass or otherwise "take" a pygmy-owl. These activities have a broad scope. The potential liability for take is criminal or civil in nature, and civil cases can be brought by the United States Fish and Wildlife Service or by private citizens. Significant for Pima County is that fact that local governments have been held liable for issuing permits that result in the take of a listed animal after the holder of the permit violates the federal law.

2. Exception: An exception to the prohibition on take for landowners and local governments is found in Section 10 of the Endangered Species Act. Under this provision, a take that is incidental to otherwise lawful activity can be permitted if certain conditions are met. The Sonoran Desert Conservation Plan will receive a Section 10 permit when it is completed.

3. Prohibition on jeopardy for federal agencies and projects with a federal nexus: Federal agencies have a higher regulatory standard to meet under Section 7 of the Endangered Species Act. Any action by a federal agency, or any private action that has a federal nexus, must not jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of a listed species habitat. When any proposed federal action (or action with a federal nexus) "may affect" a listed species or its critical habitat, formal consultation with the Service is required, unless the federal action agency determines -- and the Service concurs -- that the proposed action "may affect but is not likely to adversely affect" a listed species or critical habitat. This determination can only be made if all of the reasonably expected effects of the proposed action will be discountable, insignificant, or beneficial.

If a federal nexus exists then proposed actions that may affect a listed species **or** its critical habitat are subject to formal consultation. The mere presence of suitable habitat may trigger a "may effect" determination. Actions reviewed in formal consultation are subject to jeopardy analysis , which determines whether the species can be expected to survive and recover given the aggregate effects of everything that led to the species status, and for non-federal activities, those things likely to affect the species in the future, the environmental baseline, all effects of the proposed action, and the cumulative effect of other anticipated actions.

4. Enforcement -- Section 11 of the Endangered Species Act provides for criminal and civil penalties and enforcement. Under Section 11 (b), any person who knowingly violates any provision of the Act can be fined up to $50,000 or imprisoned for up to one year. A knowing violation of regulations is subject to fines up to $25,000 or imprisonment of up to six months. Civil actions are defined under Section 11(a) and can lead to fines of up to $25,000 per violation of statutory provisions, and fines of up to $12,000 for each violation of regulatory provisions. Section 11(g) provides that citizens may bring civil suit.

III. Brief Review of the Listing History of the Pygmy-Owl:

1. Listing of the pygmy-owl

- In 1992, a petition to list the pygmy-owl as endangered was filed with the United States Fish and Wildlife Service. In March of 1997, the Service listed the pygmy-owl as endangered.

- Basis of the listing -- The pygmy-owl was listed for protection as a Distinct Population Segment, and the following factors were considered:

  (1) The present or threatened destruction, modification, or curtailment of the species habitat or range.

  (2) Inadequacy of existing regulatory mechanisms.

  (3) Man made factors affecting continued existence, i.e., low levels of genetic variation.

2. Landowner Take Guidance

- December 1997 Guidance and 1998 Draft Guidance: Shortly after the pygmy-owl was listed the Service issued guidance to landowners in December of 1997. Intended to help landowners assess their risk of take, the guidance recommended surveys in desert scrub habitat. In August of 1998, this guidance was revised in a draft proposal published in the Federal Register to add riparian habitat, recommend two years of surveys during specific times of the year, and serve notice to seven counties in addition to Pima County that development plans or land use activities in riparian or desert habitat below 4000 feet "may affect pygmy-owls or their habitat." The 1998 proposed Guidance went through a comment period that lasted for seven months, closing after a number of extensions on March 14th of 1999. One year after the comment period closed, the Service published Guidance for landowners, describing risk of take in terms of "zones."

- March 2000 Guidance: In March 2000, the Service issued *Recommended Guidance for Private Landowners Concerning the Cactus Ferruginous Pygmy-Owl (Landowner Take Guidance)*, which included three survey zones, and three vegetation communities: riparian vegetation; Sonoran desertscrub; and semi-desert grassland. The Guidance is very broad and states that "any of these three areas, without saguaros, but which contain appropriate trees and lower level cover, are considered suitable if there are individual trees with a trunk diameter of 6 inches or measured at 4.5 feet above the ground." The Guidance also states that risk of take exists in "all areas that meet the suitable habitat criteria regardless of whether the activity is occurring within, or outside of, the designated Critical Habitat boundary for the pygmy-owl."

Survey Zones: Survey zones are delineated for known occupied habitat (Zone 1) and suitable habitat (Zone 2). Zone 3 represents the historic range.

In Zone 1, which originally covered 654,575 acres in Pima County, landowners are to "proceed as if pygmy-owls are present." This is because Zone 1 "encompasses all recent pygmy-owl locations" (dating back to January 1, 1993). The breakdown for acreage in the March 2000 description of Zone 1 included:

86,316 acres = Northwest Tucson
223,936 acres = Organ Pipe
31,758 acres = Southwest Tucson
312,565 acres = Altar Valley
Total 654,575 acres

Within Zone 2 the Guidance advises that landowners coordinate with the Service before removing any of the vegetation components of suitable habitat to reduce the risk of taking a pygmy-owl and violating Section 9 of the Endangered Species Act. Other options include developing a Section 10 Habitat Conservation Plan or conducting surveys and going forward (at the risk of take) under closely monitored conditions.

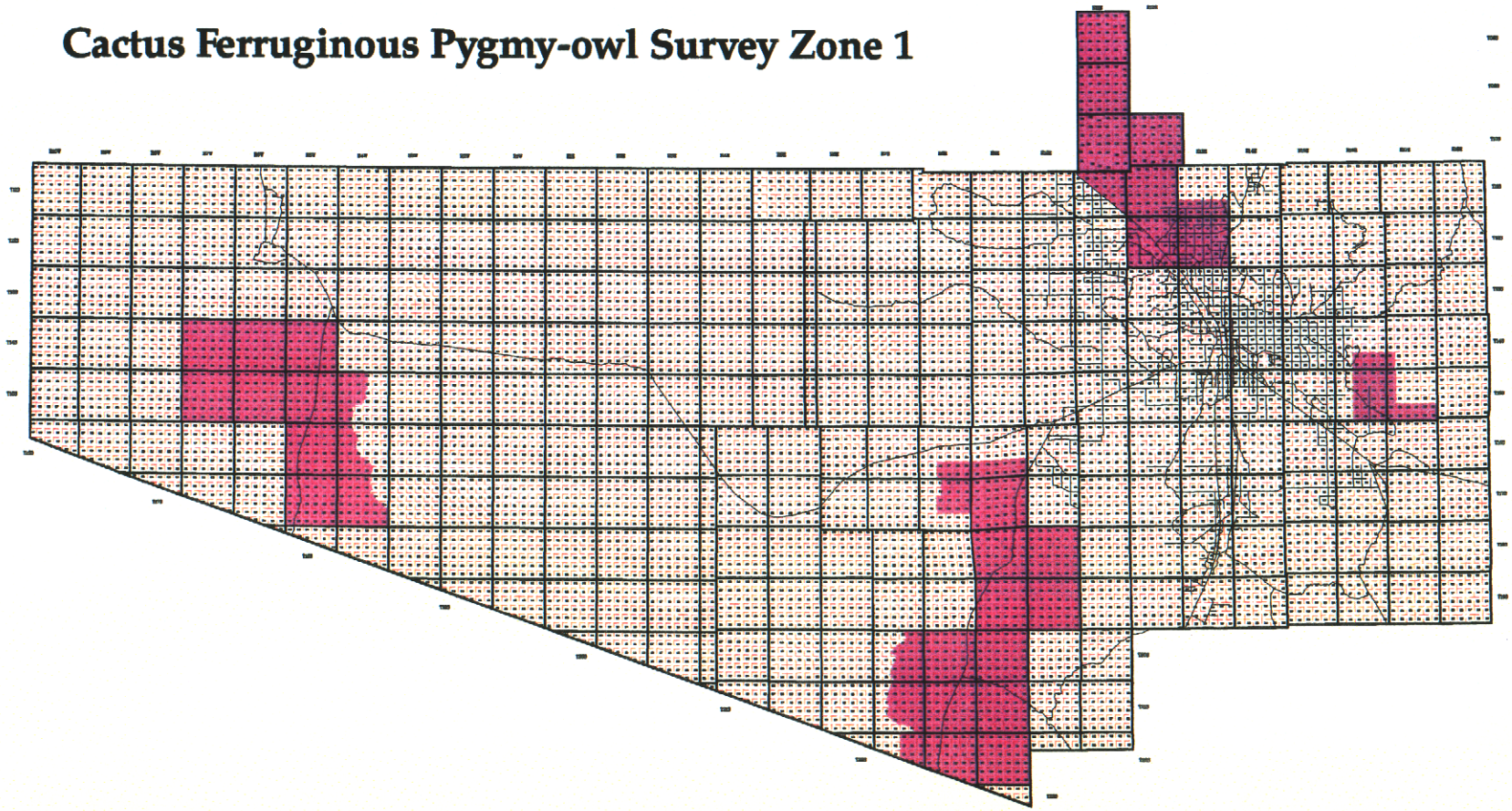
Within Zone 3, which is the lowest risk category, the Guidance states that "any land-clearing activities affecting suitable habitat, and involving private landowner actions that have a Federal nexus, consultation under Section 7 of the Act may be required."

The Landowner Take Guidance states: "Unlike private landowners, federal agencies have additional responsibilities under the Endangered Species Act (Section 7) and we recommend they contact Fish and Wildlife Service before undertaking any actions or issuing permits that might affect the pygmy-owl or its habitat in any zone, regardless of whether or not an owl is currently located in the area."

Private individuals who have a project with a federal nexus are subject to the same rules. A nexus exists with EPA if the project is over 5 acres of impact. A nexus exists with Army Corps if the project crosses a wash. Zone 1 "encompasses all recent pygmy-owl locations."

Since the endangered species issue follows the owl, projects with a five acre impact in Zone 1 have a federal nexus. Zone 1 will continue to be modified as new owls are located. In fact whenever a federal nexus exists, proposed actions that may affect a listed species -- by adversely impacting suitable habitat in any zone -- are subject to formal consultation regardless of whether the action is within critical habitat.

Cactus Ferruginous Pygmy-owl Survey Zone 1



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/pygmyowl2/sonora/aals/owl_1.aml

Township/Range Lines
Section Lines
Survey Zone 1

Arizona Index Map

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THE SEAL OF PIMA COUNTY · ARIZONA ·

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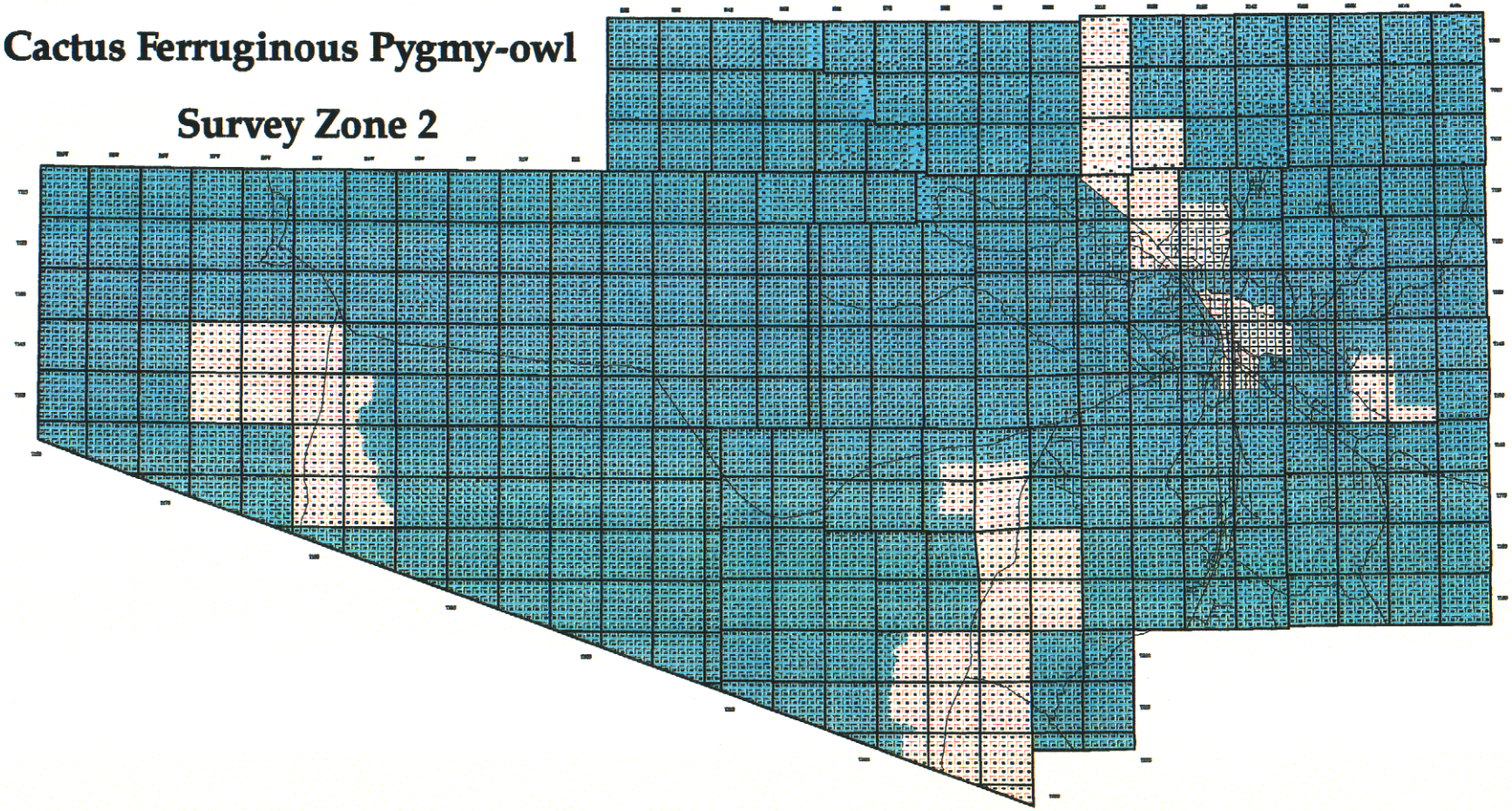
Cactus Ferruginous Pygmy-owl

Survey Zone 2



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Township/Range Lines
Section Lines
Survey Zone 2

Arizona Index Map

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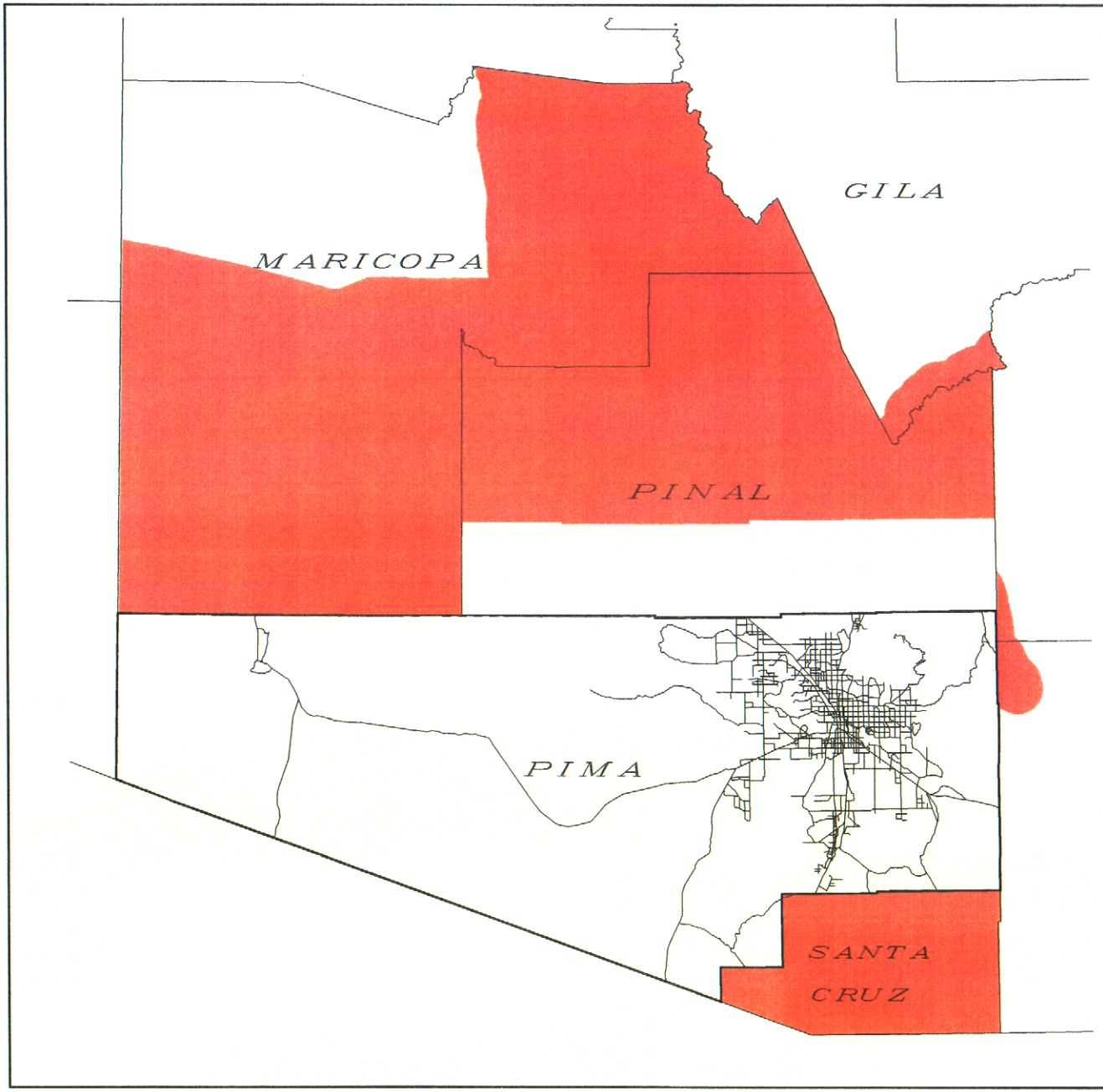
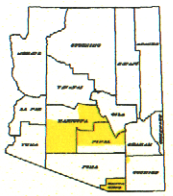


Cactus Ferruginous Pygmy-owl Survey Zone 3

Survey Zone 3

Arizona Index Map



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3. Critical Habitat

Background Information about the Decision to Designate: On December 30, 1998, in compliance with a court order, the United States Fish and Wildlife Service published a proposed rule for designating critical habitat for the cactus ferruginous pygmy-owl and announced that the Service would accept comments through March 1, 1999. The proposal included approximately 730,565 acres of riverine habitat and upland habitat across Pima, Pinal, Maricopa and Cochise Counties. Three public hearings were held, including a February 12, 1999 hearing in Tucson. By court order, a final decision about whether to designate critical habitat was due by June 30, 1999. On July 12, 1999, the Service published its designation of approximately 731,712 acres as critical habitat.

What is Critical Habitat? Critical habitat is defined in the U.S. Code as: "the specific areas within a geographic area occupied by the species at the time of listing ... on which are found physical or biological features essential to the conservation of the species and which may require special management considerations or protection; and specific areas outside the geographic area occupied by the species at the time it is listed ... upon a determination of the Secretary that such areas are essential for the conservation of the species."

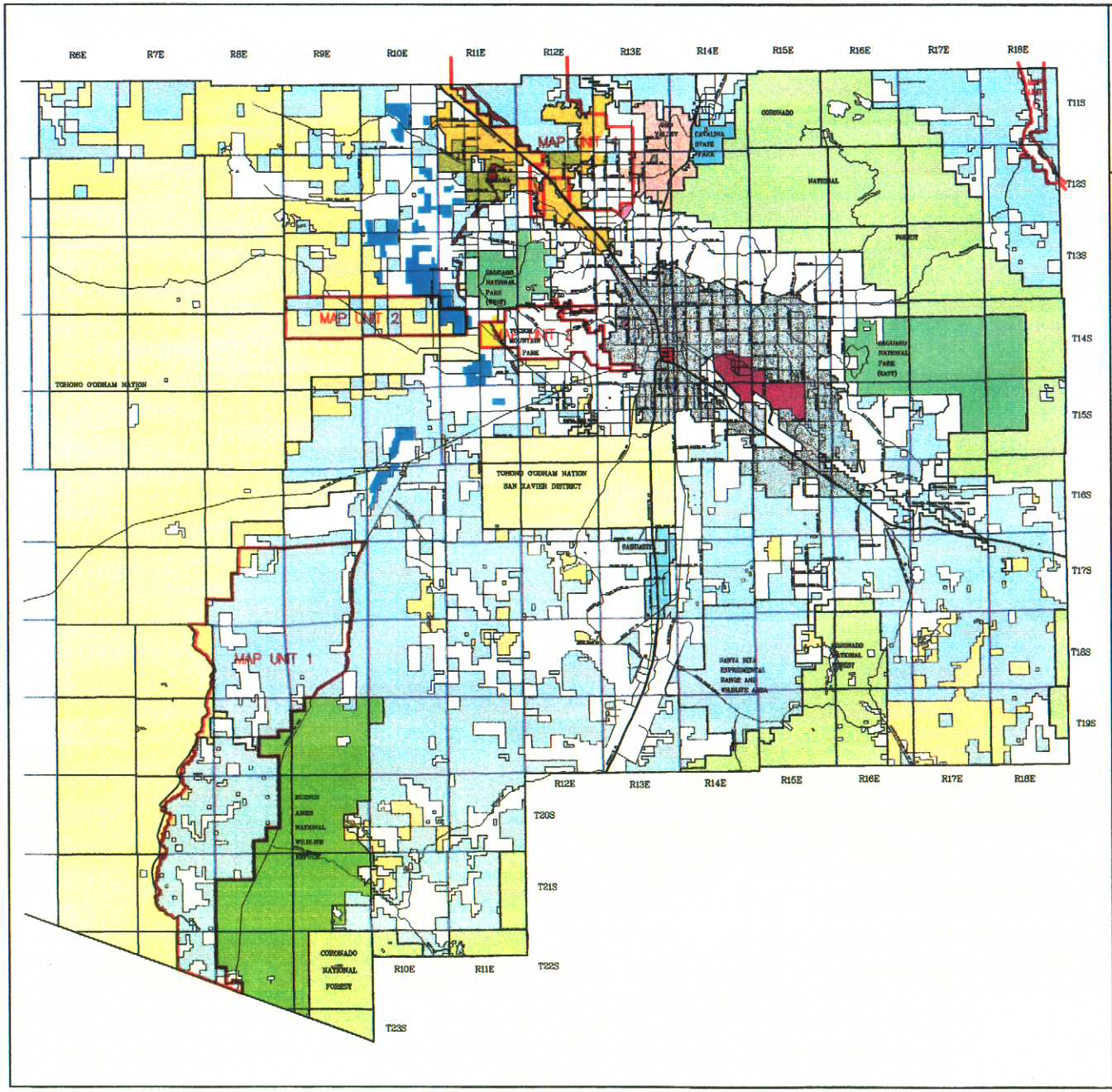
What is the Land Ownership of Designated Critical Habitat? The table below describes the land ownership of critical habitat as published in the December 1998 Federal Register. The map on the following page reflects where specific units of proposed critical habitat are located within Pima county according to the original proposal.

Federal Register Table of Approximate Critical Habitat Acreage

	Pima	Cochise	Pinal	Maricopa	Total
Forest	0	0	4,160	32,840	37,000
BLM	21,070	0	90,640	0	111,710
State	154,750	2,420	258,005	0	420,175
Private	60,060	2,420	74,400	100	136,980
Other	20,700	0	4,000	0	24,700
TOTAL	**261,580**[1]	**4,840**	**431,205**	**32,940**	**730,565**

Does Critical Habitat Establish a Limitation in the Extent of the Service's Obligation to Consult with Federal Agencies? No. Projects that impact suitable habitat -- regardless of where such occurs -- are subject to a federal agency determination that such project "may affect pygmy owls." If a federal nexus exists then proposed actions that may adversely affect a listed species **or** its critical habitat are subject to formal consultation.

[1] There is a 5,000 acre discrepancy in the chart between the Pima County total and the breakout by land owner within Pima County.

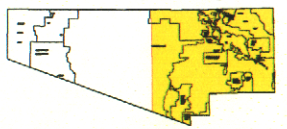


Designated Critical Habitat for the Cactus Ferruginous Pygmy Owl In Pima County Map Units 1-4 And 6

U.S. Fish And Wildlife Service
As Published In The Federal Register 12/30/98

- Map Unit Boundaries
- Major Roads And Streets
- Township And Range Lines
- Administrative Boundaries
- Bureau Of Land Management (BLM)
- Bureau Of Reclamation
- Bureau Of Reclamation Addition
- Catalina State Park
- Existing Pima County Mountain Parks
- Indian Nation
- Military Reservation
- National Forest Land
- National Parks And Monuments
- National Wildlife Refuge
- Non-Federal Parks
- Private Lands
- State Trust Lands
- Tucson Water Land
- Other
- Tucson
- South Tucson
- Marana
- Sahuarita
- Oro Valley

Pima County Index Map



Index Map Scale 1:2,500,000

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/mech33/special/parks/proposed/emls/pygmy3.eml

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IV. Brief Review of Relevant Biological Issues Related to the Listing of the Pygmy-Owl

In 1997 when the pygmy-owl was listed as endangered, there were 12 known owls. Today, there are not many more in Pima County. The Service listed a number of threats to the continued existence of pygmy-owls, including habitat loss and low genetic variation. This section of the report describes how four years after the listing, the overall population of owls has not increased in any way that indicates improved conditions, the cumulative impacts of development greatly exceed the five housing and development projects known to the Service at the time of the listing, and the outlook for genetic fitness of owls in northwest Tucson is potentially dimmer than it was at the time of the listing.

1. Best Science Available in 1997

Threats -- The pygmy-owl was listed for protection as a Distinct Population Segment, and the following factors were considered as threats to its survival: (1) The present or threatened destruction, modification, or curtailment of the species habitat or range; (2) Inadequacy of existing regulatory mechanisms; (3) Other natural or man made factors affecting continued existence, i.e., low levels of genetic variation.

Population size -- According to a 1998 Status of the Species Report prepared by U.S. Fish and Wildlife, the number of known owls during the 1990s is as follows:

- 1990 - "Formal surveys for the pygmy-owl on Organ Pipe Cactus National Monument began in 1990, with **one** pygmy-owl located that year."
- 1992 - "Beginning in 1992, in survey efforts conducted in cooperation with the Arizona Game and Fish Department, **three** single pygmy-owls were located on the Monument."
- 1993 - "In 1993, ... surveys again located **three** single pygmy-owls in Arizona."
- 1994 - "During the 1993 to 1994 survey period, **one pair** of pygmy-owls was detected in north Tucson."
- 1995 - "**Two** individual pygmy-owls were found in northwest Tucson during 1995 surveys, **and an additional pygmy-owl** was detected at Organ Pipe."
- 1996 - "In 1996, the Arizona Game and Fish Department focused survey efforts in northwest Tucson and Marana and detected a total of **sixteen** pygmy-owls, two of which were a pair, and two of which were fledglings. **Three additional** pygmy-owls were detected at Organ Pipe in 1996, with additional unconfirmed reports from Organ Pipe."
- 1997 - "In 1997, survey efforts of the Arizona Game and Fish Department located a total of ten pygmy-owls in the Tucson Basin study area ... Eight of the 10 pygmy-owls were found in the northwest Tucson area, and the remaining two were found on the western bajada of the Tortolita Mountains. The total of 10 pygmy-owls from northwest Tucson for the year included one pair which successfully fledged four young. ... Two adult males were also located at Organ Pipe."

2. Best Science Available since the 1997 Listing

Population size -- Since the listing of the pygmy-owl in 1997, survey efforts have resulted in a slightly increased known population.

- 1998 - 31 owls were found.
- 1999 - the number including juveniles rose above 70.
- 2000 - the total population dropped again to 34 adults in Arizona.

The general areas where owls have been found are (1) northwest Tucson and Pinal County; (2) Altar Valley; and (3) Organ Pipe Cactus National Monument. No dispersal between these areas has been documented.

Estimate of pygmy-owls tolerance for disturbance -- Biologists have estimated how much ground disturbance pygmy-owls can tolerate by measuring the actual level of disturbance that exists in the home range (280 acres) surrounding nest sites or activity centers. On average, the percent disturbance in home ranges subjected to this review was approximately 20 percent. Applying this as the best information available, the Service generally limits ground disturbance for proposed projects in northwest Tucson to about 20 percent of the project area. When such is not possible on site, suitable habitat that is sufficiently near the site might be conserved in an amount that leads to an overall conservation achievement of 80 percent.

Genetics -- In March of 1999 Pima County contracted for a pygmy-owl genetics study. The results of the study, now completed, show that the Arizona pygmy-owls are not related as a subspecies to pygmy-owls in Texas, nor to owls in the vast majority of Mexico, and they are not related as a species to owls in South America. The genetic connection to owls in the nearby state of Sonora, Mexico and perhaps to Sinaloa, might be less viable as a landscape connection given agricultural expansion during the past 75 years.

Pygmy-owls in northwest Tucson now deserve greater attention as a result of the study. Within Arizona, the northwest side pygmy-owls are in a distinct clade that suggests current separation between the Eastern Pima County population segments. We know that in addition to their low numbers and isolated status, ferruginous pygmy-owls in northwest Tucson "have extremely low levels of average haplotype diversity."

Data collection on mating among individuals in this area confirm that inbreeding is occurring at least to the second generation. Inbreeding depression combined with demographic factors and ongoing habitat impacts in the area might set the stage for extinction of this population unless management actions are taken. Further study is recommended, and the County will look to the biologists on the Recovery Team and employed by the United States Fish and Wildlife Service for advice about whether special management or other actions that are needed to avert extinction caused by the potential and perhaps foreseeable cascade of these circumstances.

V. Existing Commitments and Conservation Opportunities

This section asks the question of whether the general biological goal of conserving 80 percent of the pygmy-owl's home range in the northwest side can be achieved in (1) areas designated as Critical Habitat, (2) areas delineated as Zone 1 that are outside Critical Habitat; and (3) the aggregate Critical Habitat and Zone 1 uses. A land analysis was conducted across five categories of uses:

(1) built;[2]
(2) public but not protected;[3]
(3) zoned for more than SR;[4]
(4) rural (3.3 to 200 acre parcels);[5] and
(5) land within a reserve.[6]

A. Unincorporated Pima County Land Use Analysis (Not Including State Land)

1. Unincorporated Pima County within Critical Habitat

LAND USE	ACRES	PERCENT
Built	6990.94	45.37%
Public - not protected	1561.81	10.1 %
Zoned greater than SR	587.66	3.8 %
Rural (3.3 to 200 acres)	4684.05	30.4%
Land within reserves	503.06	3.26%
Data not available	1,082.20	7 %
TOTAL	15,409.72	100 %

[2] "Built" is defined based on Assessor's records to include all parcels that are not assessed as vacant land or agricultural land.

[3] "Public land" includes non-state land that is in public ownership but not protected for conservation purposes.

[4] "Zoned greater than SR density" includes vacant land zoned at densities greater than SR, including all specific plans.

[5] "Rural" includes vacant land zoned at the equivalent of SR or lesser densities.

[6] "Reserve" includes conserved land with a GAP status of 1, 2, or 3.

2. Unincorporated Pima County -- Area within Zone 1, Outside Critical Habitat

LAND USE	ACRES	PERCENT
Built	8,872.60	60.6 %
Public - not protected	262.2	1.8 %
Zoned greater than SR	654.67	4.4 %
Rural (3.3 to 200 acres)	1,512.29	10.3%
Land within reserves	1877.98	12.8%
Data not available	1462.74	9.98%
TOTAL	14,642.48	100 %

3. Unincorporated Pima County -- Combined Critical Habitat and Zone 1 Outside Critical Habitat

LAND USE	ACRES	PERCENT
Built	15,863.54	52.8 %
Public - not protected	1,824.01	6.07 %
Zoned greater than SR	1,242.33	4.13%
Rural (3.3 to 200 acres)	6,196.34	20.62%
Land within reserves	2,381.04	7.9 %
Data not available	2,544.94	8.47%
TOTAL	30,052.20	100 %

4. Density of Built Land in Unincorporated Pima County on the Northwest Side

Land with single family homes on large lots (3.3 acres or greater) that retain sufficient habitat have served as nest sites and activity sites for pygmy-owls. For unincorporated Pima County land on the northwest side, not including State Land,

- 4,779 acres, or **68** percent of built land within Critical Habitat, is large lot.
- 3,697 acres, or **42** percent of built land that is within Zone 1 but outside Critical Habitat, is large lot.
- 8,476, or **53** percent of built land that is within critical habitat and within Zone 1 but outside critical habitat, is large lot.

B. Pima County Capital Improvement Projects in Critical Habitat and Zone 1

Transportation: There are seven road projects in the area. The calculations below assume a worst case scenario in terms of impact. The total impact under this analysis would be 220.35 acres, and total mitigation would be 889.4 acres. The mitigation assumes a 4 to 1 ratio to achieve 20 percent disturbance on a landscape level.

- Thornydale, Magee to Cortaro Farms: Impact = 11.04 acres; Mitigation = 44.16 acres
- Thornydale, Cortaro Farms to Linda Vista: Impact = 28.64 acres; Mitigation = 114.55 acres
- Cortaro Farms, I-10 to Thornydale: Impact =48 acres; Mitigation = 192 acres
- Magee/Cortaro, Thornydale to La Canada: Impact = 22.9 acres; Mitigation = 91.6 acres
- Twin Peaks, Sidewinder to Marana Town Limits: Impact = 4.77 acres; Mitigation = 19.5 acres
- La Canada, Ina to Lambert: Impact = 76 acres; Mitigation = 312 acres
- Magee, La Canada East: Impact = 29 acres; Mitigation = 116 acres.

Cultural Resources: There are three cultural resource projects in the area: one is an acquisition project; another is a trail with a maximum impact of 34 acres; and the third is a parking lot with a maximum impact of 5 acres. Total potential impact requiring mitigation by Pima County: 39 acres. Total mitigation: 156 acres.

Parks: There are two parks projects identified in the capital improvement bond program. One is in Marana (Marana Rattlesnake Park) and should be located in the vicinity of the Santa Cruz River and Cortaro Farms. The other is the Tortolita Shooting Range which is not being pursued. Total impact requiring mitigation by Pima County: 0.

Wastewater: The Ina Road Treatment Plant project will have no habitat impact.

Summary of potential impacts and mitigation:

Total potential impact of projects	259.35 acres.
Total potential mitigation	1,037.40 acres

C. Summary of Land Use Commitments and Conservation Opportunities within Critical Habitat

The data on land use in the unincorporated northwest side of Pima County (not including State Land) was reviewed in order to begin to answer the question of whether a general biological goal of conserving 80 percent of the pygmy-owl's range in designated Critical Habitat can be achieved. This section summarizes data within Critical Habitat. Land use commitments are greater in the area that is delineated as survey Zone 1, but not within Critical Habitat, and conservation opportunities are far less. The data suggests the following land use commitments and conservation opportunities within Critical Habitat (capital improvement projects are not included in this calculation):

Unincorporated Pima County (not including State Land)

According to the existing data reflecting the built and zoned land uses within the area designated as Critical Habitat in unincorporated northwest Pima County (not including State Land):

> Pima County Government has conservation opportunities across 74 percent or less of the landscape, but only if the large lot built environment is included and actually adds to the conservation of the pygmy-owl and 26 percent or more of unincorporated Pima County is unlikely to contribute to pygmy-owl conservation.

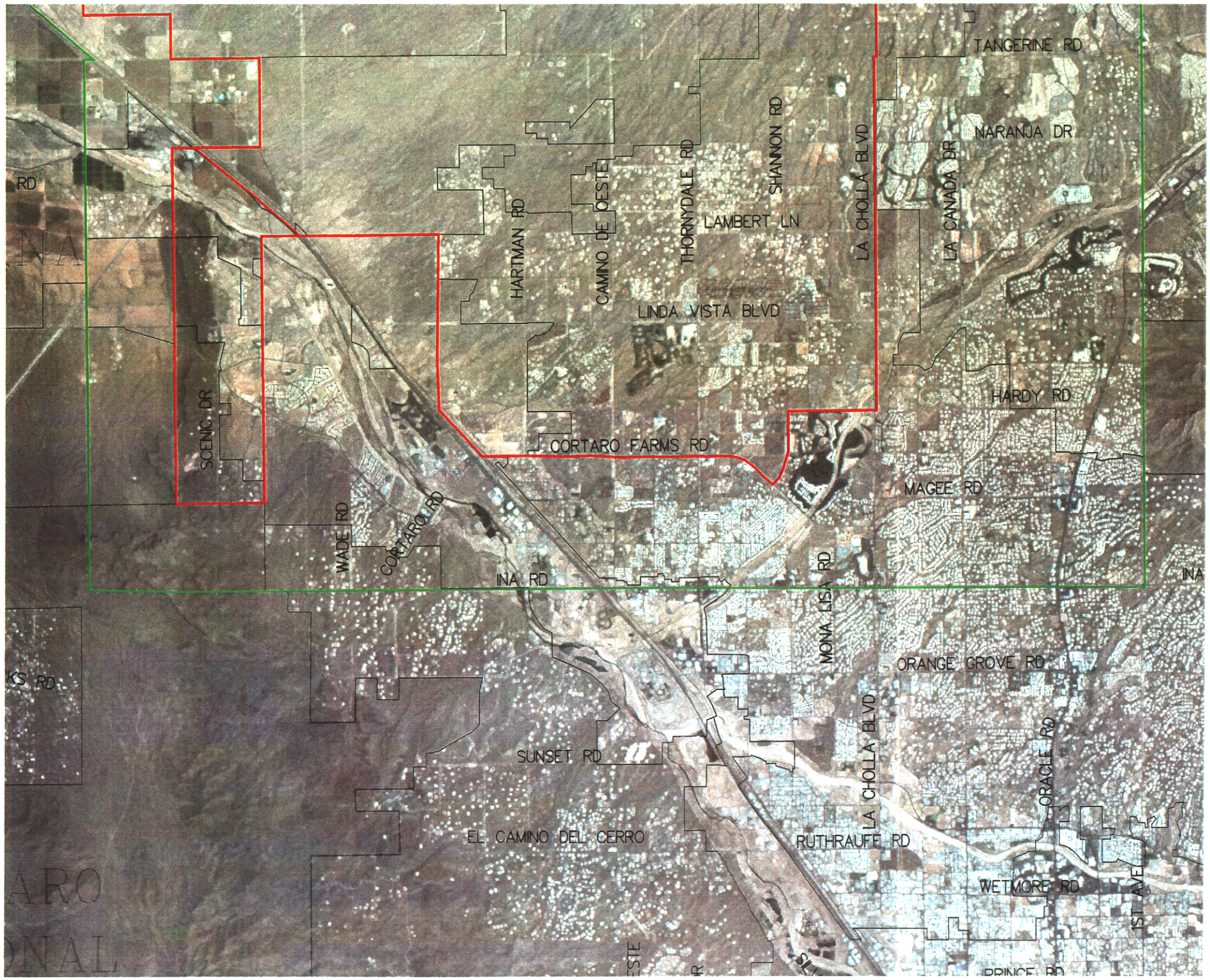
CONSERVATION OPPORTUNITIES FOR PYGMY-OWL PROTECTION	COMMITMENTS NOT CONSISTENT WITH PYGMY-OWL CONSERVATION
4779 acres built on large lots +	2,212 acres built on small lots +
600 acres (approx.) public use +	962 acres public use, not protected +
4684 acres zoned rural +	587.66 acres zone greater than SR =
503 acres protected in reserves =	
10,566 acres of potential conservation land	**3,762 acres of land unlikely to be conserved**

Of the 14,328 acres of identified land uses in critical habitat in unincorporated Pima County,

- **74** percent have a conservation potential, while
- **26** percent are not likely to lead to pygmy-owl conservation.

The map on the next page portrays general land use commitments and conservation opportunities across the jurisdictions.

NW Eastern Pima County Pygmy-owl Critical Habitat and USFWS Owl Survey Zones



Administrative Boundaries

Pygmy-owl Critical Habitat

USFWS Owl Survey Zone 1

PIMA COUNTY DEPARTMENT OF TRANSPORTATION
TECHNICAL SERVICES

Pima County Technical Services?
201 North Stone Avenue - 9th Floor?
Tucson, Arizona 85701-1207?
(520)740-6670 - FAX:(520)798-3429?
http://www.dot.co.pima.az.us?

N

Scale 1:25,000

THE SEAL OF PIMA COUNTY ARIZONA

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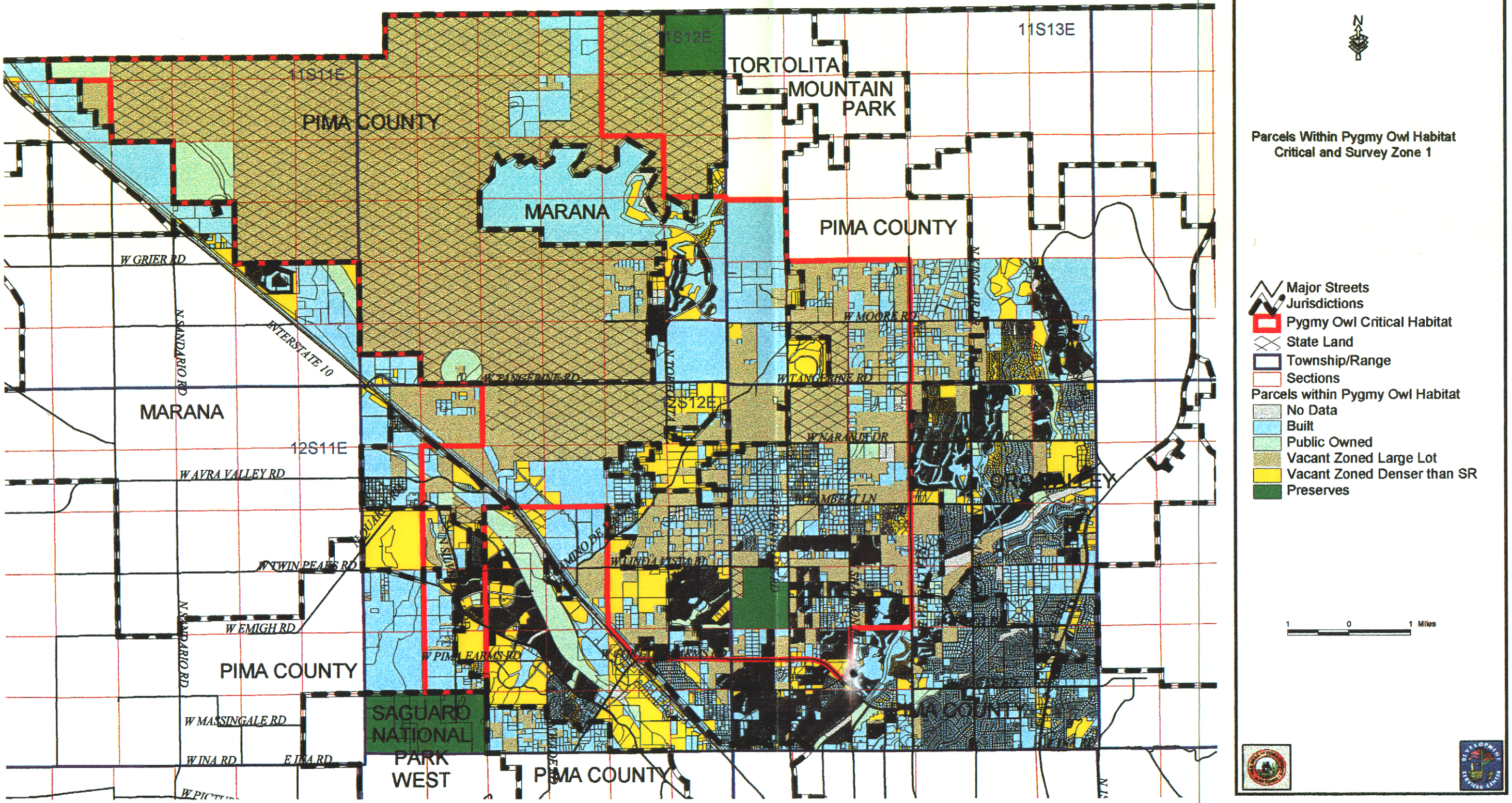
Plotted: 02/12/01



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VI. A Principled Approach to Mitigation

A. Background -- The United States Fish and Wildlife Service has negotiated a few Section 7 consultations according to biologists estimates of how much ground disturbance pygmy-owls can tolerate. By measuring the actual level of disturbance that exists in the home range (280 acres) surrounding nest sites or activity centers, it was found, on average, that the percent disturbance in home ranges was approximately 20 percent. Applying this as the best information available, the Service generally limits ground disturbance for proposed projects in northwest Tucson to about 20 percent of the project area. When such is not possible on site, suitable habitat that is sufficiently near the site might be conserved in an amount that leads to an overall conservation achievement of 80 percent.

The data analyzed for this report indicates that the overall goal will be difficult to obtain. Mitigating on a project-by-project level is not likely to achieve the overall goal, either numerically, or from the standpoint of assembling a reserve that functions and achieves pygmy-owl conservation and recovery. In order to suggest principles for creating a reserve that more nearly approaches the biologists' goal, this section of the report summarizes the attached 1999 study by the Environmental Defense Fund on *Mitigation Banking as an Endangered Species Conservation Tool*. Whereas the Army Corps and EPA began the practice of mitigation banking for wetlands under the Clean Water Act back in the early 1980s, and Federal Guidance was established in 1995, the Endangered Species Act lacks a policy for mitigation banking. *Mitigation Banking as an Endangered Species Conservation Tool* demonstrates that the "no net loss" standard of wetlands mitigation and related administrative practices will require modification for purposes of endangered species mitigation.

B. Nine Standards Recommended for Endangered Species Mitigation and Recovery Banking -- Pointing out that there are differences between wetlands and endangered species that should lead to a different type of mitigation guidance and policy, the following standards are discussed and recommended in the attached study.

1. Endangered species mitigation banking should reward preservation in addition to restoration and habitat creation. Under the Clean Water Act, wetland banking policy does not reward preservation of existing wetlands with credits. Instead, restoration or enhancement is rewarded. The attached study by the Environmental Defense Fund recommends that endangered species mitigation banking should reward preservation, in addition to restoration and habitat creation. The reasons for this include that preserving currently suitable but unoccupied habitat will make it more likely that the endangered animal will recover. Because some effort greater than 'no net loss' is required for recovery, the study indicates that a mitigation bank should enlarge and create buffers around occupied habitat and enhance unoccupied habitat. The recommendation goes on to say that when active management is required for recovery, this too should be rewarded in a mitigation bank. Current landowners who have land that is suitable or critical for an endangered animal may become part of the bank by committing to preservation and engaging in some form of active management.

2. Endangered species mitigation banking should determine "service areas" or recovery units in light of recovery plans. The attached study distinguishes wetland banking from endangered species banking again by pointing out that under the Clean Water Act, wetland mitigation banks are required to be near the area of impact -- within the same watershed, but success under the Endangered Species Act calls for a different goal than that of "no net loss." Recovery, a higher standard, places a focus on numerical monitoring of species status in addition to landscape goals. Strategies for determining service areas should be keyed to the recovery plan for the endangered animal. When there is more than one service area, or recovery unit, the authors indicate that when the goals in one recovery unit have been met, trading credits across recovery areas might serve recovery goals, hasten recovery, and enhance the economic viability of mitigation banks.

3. Endangered species mitigation banking should determine the credits and debits for mitigation banking according to the various needs of the listed species being protected. Under the Clean Water Act, wetlands mitigation policy seeks to restore wetland function, but in the absence of a clear measure of "function," acreage mitigated at a 1 to 1 ratio is substituted. For endangered species, acres are not a proxy for effective mitigation land. In fact, there is no formula that applies to all species. It is a "practical reality that the varied circumstances of species will produce different currencies to define bank credits and debits." (P. 32) The 4 to 1 ratio for pygmy owls determined by the average amount of disturbance they tolerate in their home range is an example of such.

4. Endangered species mitigation banking should be allowed to occur on local government land if credits are based on those values that are supplemental to the public program that is in place. Under the Clean Water Act, when private actions impact wetlands, the mitigation of this activity on federal lands is limited. Only federal activities that exceed baseline protection can be considered part of a mitigation bank. For purposes of mitigation banking under the Endangered Species Act, it is recommended that federal lands generally not be included in the bank for purposes of issuing credits to private sector; however, it is recommended that local government land be allowed to serve as a bank if credits are based on those values that are supplemental to the public program that is in place.

5. Endangered species mitigation banking should attempt to conserve to the maximum degree in advance of allowing impacts, but structure the sale of credits so as to align incentives with those who are buying into the bank. The wetlands mitigation banks allow limited advance sale of credits to begin the revenue generating process that opens banks. Ideally, conservation would occur in advance of allowing impacts, but this is sometimes financially not possible. Therefore, the study recommends that endangered species banking policy should attempt to conserve to the maximum degree in advance of allowing impacts, but structure the sale of credits so as to align incentives with those who are buying into the bank.

6. Endangered species mitigation banking should remain adaptive to the status of the species. Wetland banking requires permanent protection, as does current habitat conservation plan policy. Managing for endangered species recovery requires knowledge that some habitats are occupied at a certain stage of their successional development and other habitat will be abandoned because it becomes unsuitable due to surrounding impacts. Therefore, according to the attached study, it is not possible to conclude that endangered species mitigation banks should always be permanent. Instead, a protection standard might require (1) permanent protection with a downward adjustment of the mitigation ratio as endangered species protection decreases, or (2) less than permanent protection might be instituted, with active management and monitoring to determine ongoing utility of the bank. (P. 35)

7. Endangered species mitigation banking should include areas that are not currently occupied as part of the overall reserve design. The federal wetland policy sequences protection standards in the order of avoidance, minimization and mitigation. The Endangered Species Act has to achieve more than the standard of no net loss, therefore, even the high standard of avoidance merely "perpetuates the existing, unsatisfactory status quo" for habitat of endangered animals. Areas that are not currently occupied but are suitable should be included as part of the design of banks. (P. 36)

8. Endangered species mitigation banking should be built according to the needs of the species of concern, and strategies about on-site mitigation or consolidated banking are made accordingly. Wetland mitigation banks have often been limited to those who have small projects where on site mitigation is not beneficial to the larger goal of protection of viable systems, but larger projects have been encouraged to mitigate on site. It is recommended that endangered species banks be built according to the needs of the species of concern, and strategies about on-site mitigation or consolidated banking should be made accordingly.

9. Endangered species mitigation banking should encourage public and private bank formation. Wetland banks can be owned by the public or private sector. It is recommended that endangered species banks operate in a similar fashion, to encourage the formation of banks at early high risk stages by public sector, and the participation in banking by private sector when risks are more easily calculated.

VII. Conclusion

This study provides a brief review of the rules, listing history, and biology relevant to the status and protection of the pygmy-owl in Pima County. Land use in unincorporated northwest Pima County is analyzed to determine existing commitments and conservation opportunities. Only through a comprehensive and principled mitigation strategy will the goals of the biologists be approached. Nine standards are recommended for endangered species mitigation and recovery banking, based on the work by the Environmental Defense Fund. A "Draft Policy on the Establishment, Use and Operation of Mitigation Banks under the ESA" and a "Model Endangered Species Mitigation Banking Agreement" are attached for future discussion.

Attachments

1. Mitigation Banking as an Endangered Species Conservation Tool

2. Case Studies of Selected Endangered Species Mitigation Banks

3. Draft Policy on the Establishment, Use and Operation of Mitigation Banks under the ESA

4. Model Endangered Species Mitigation Banking Agreement

MITIGATION BANKING AS AN ENDANGERED SPECIES CONSERVATION TOOL

A Report by the
Environmental Defense Fund

in cooperation with
Sustainable Conservation

November 1999

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EXECUTIVE SUMMARY

Mitigation banking is a tool now widely used in wetland conservation programs but is only beginning to be used in endangered species conservation programs. In the wetland programs, mitigation banking has long been promoted as a way to conserve wetlands at a lower cost than by traditional forms of mitigation. It also creates an incentive for at least some landowners to create, restore, enhance, or preserve wetlands, in order to be able to sell "credits" to others who need to mitigate projects that damage wetlands. Traditional wetland mitigation has a dismal track record, and it is not clear whether wetland mitigation banking will fare better. Its detractors are many.

The first wetland mitigation banks were established nearly two decades ago. It was not until 1995, however, that the several federal agencies with wetland conservation responsibilities could agree on uniform guidance concerning the establishment and operation of mitigation banks. Since then, wetland mitigation banking has become more common and consistent.

Because the laws protecting wetlands and endangered species permit otherwise prohibited activities if they are properly mitigated, the interest in endangered species mitigation banking may well grow, just as wetland mitigation banking did. Like the first wetland mitigation banks, the first endangered species mitigation banks are functioning without the benefit of any relevant, overarching federal policy. Indeed, California is the only state that does have a formal policy governing the use of mitigation banking (which it calls *conservation banking*) for endangered species. The principles of the California policy differ in many respects from those of the federal wetlands guidance.

Since the California policy was instituted in 1995, many endangered species mitigation banks have been established there, and they are now beginning to be established outside California as well. Interest in using this tool for endangered species purposes is clearly growing. Consequently, the U.S. Fish and Wildlife Service needs policy guidance for its own staff and for private interests concerning how endangered species mitigation banks should be established, operated, and overseen.

Because endangered species and wetlands differ in the extent of legal protection provided to each and in the laws and programs pertaining to their conservation, the policies for endangered species mitigation banking and wetland mitigation banking should differ as well. Accordingly, this report describes some of the issues that must be addressed in a federal policy on endangered species mitigation banking, suggests how those issues should be resolved, and proposes a draft policy for adoption by the U.S. Fish and Wildlife Service. This report also includes short case studies of several endangered species mitigation banks that are now in operation or are under development. Finally, the report contains a model endangered species mitigation banking agreement that will effectively conserve endangered species.

I. INTRODUCTION

A recent headline on the front page of the *Wall Street Journal* hailed the opening of the nation's first "butterfly bank."[1] The "deposits" in this unusual bank are conservation credits earned as a result of having preserved an important area of habitat for the Quino checkerspot butterfly (*Euphydryas editha quino*), an endangered species restricted to California. The bank's intended customers are other landowners who hope to develop other sites where the butterfly is found. In order to do so, they can buy credits from the private entrepreneur who established the butterfly bank.

Meanwhile, just a week earlier on the nation's other coast, the state of North Carolina announced that it was purchasing a large tract of land containing a number of endangered red-cockaded woodpeckers (*Picoides borealis*). The state's intention is to earn conservation credits that it can use to meet future mitigation requirements when the state's transportation department builds new roads in woodpecker habitat elsewhere.[2] The California and North Carolina examples illustrate two forms of a new phenomenon, generally known as either *conservation banking* or *mitigation banking* for endangered species.

Mitigation banking originated in the nation's regulatory program aimed at preventing the filling of wetlands. Wetland mitigation banking began nearly two decades ago, in a largely ad hoc fashion. Few banks were developed until several federal agencies promulgated uniform guidance in 1995[3] concerning how they would evaluate and approve wetland mitigation banks (see Part 2). Today, mitigation banking for endangered species is in a position similar to that of wetland mitigation banking nearly two decades ago. That is, a few endangered species mitigation banks are beginning to be developed, but largely in an ad hoc fashion and with no federal policy or written guidance. The banks are coming first; the policies and rules will come later, if at all.

Developing an intelligent policy for endangered species mitigation banking should not take as long as it did to develop a policy for wetland mitigation banking. The reason is simply that the experience of nearly two decades of wetland mitigation banking should be helpful in designing an appropriate policy for endangered species mitigation banking. However, as this report explains, the policy cannot merely replace the word *wetland* with the words *endangered species* each time it appears in existing wetland mitigation banking policy. There are significant differences not only between endangered species and wetlands but also between the regulatory programs that seek to conserve them, and these differences may warrant quite different mitigation banking policies. The aims of this

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[1] R. Tate, "Economic Focus: 'Butterfly Bank' May Save Insects--and Developers," *Wall Street Journal*, April 14, 1999, p. 1 (California ed.).

[2] North Carolina Department of Transportation, "NCDOT to Purchase 9,732 Acres in Tyrell County for Red-Cockaded Woodpecker Preserve," News Release no. 121, April 9, 1999.

[3] U.S. Army Corps of Engineers et al., *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. Fed. Reg., 60: 58605-58614 (November 28, 1995).

report, then, are to explore those differences, examine the role that mitigation banking could play in achieving the goals of the Endangered Species Act (ESA), and suggest a policy that would best accomplish that result.

Origins and Basic Principles of Wetland Mitigation

In its most general sense, the word *mitigation* means the "abatement or diminution of something painful, harsh, severe, afflictive, or calamitous," a way, in other words, of making a bad thing less bad. In environmental contexts, *mitigation* generally refers to efforts to reduce or offset the negative environmental consequences of activities that are permitted despite their negative impact.

The origins of environmental mitigation date back at least as far as the Fish and Wildlife Coordination Act of 1934. As subsequently amended, that law sought to ensure that fish and wildlife conservation was given "equal consideration" with other objectives of major water resource development projects.[4] The construction of dams, channelization of streams, and similar public works projects can have a variety of wildlife impacts, such as blocking fish migration, destroying spawning areas, and inundating wetlands and free-flowing streams. To minimize these inherent impacts, the Fish and Wildlife Coordination Act tried to make sure that every major water resource development project included conservation features. Some of these features were intended to benefit the wildlife resource, such as fish ladders to enable fish to surmount otherwise impassable dams or hatcheries to supplement natural spawning opportunities. Other mitigation measures under the Coordination Act were intended not so much to benefit the wildlife resource as to facilitate human recreational use of it. For example, the construction of boat-launching facilities, the acquisition of existing high-quality habitats, and similar measures were undertaken to offset the loss of public hunting and fishing opportunities. The units of measure for both the adverse impacts and the compensating mitigation were often not acres of habitat or numbers of animals but numbers of human "user days."

At present, somewhat more rigorous mitigation principles are used to implement the wetland conservation provisions of the Clean Water Act. Section 404 of that law prohibits the discharge of fill or dredged material into the waters of the United States, including wetlands, without a permit from the U.S. Army Corps of Engineers (Corps). The Corps routinely requires compliance with specific mitigation measures as a condition of such permits, and it follows a three-step sequence in developing such measures: avoidance, minimization, and compensation. The first step explores the availability of practical alternatives that avoid wetland impacts altogether. If there is a practical alternative to siting a project in a wetland, the Corps will not issue a permit. If there is no practical alternative that completely avoids the wetland, the second step is to minimize the impact on it by reducing the project's "footprint," restoring temporarily disturbed habitats, or other means. Any remaining, unavoidable impacts on the wetland must then

[4] M. Bean and M. Rowland, *The Evolution of National Wildlife Law*, 3d ed. (Westport, CT: Praeger, 1997), pp. 404-408.

be remedied through compensating measures that try to offset any loss of the wetland's functions and values because of the project by creating or enhancing the functions and values elsewhere.

In addition to this sequencing requirement for wetland mitigation, other principles have been clearly established. For example, the Corps generally prefers "on-site" mitigation measures (undertaken on or very near the project site) to "off-site" measures (undertaken away from the project site). The reason is that certain wetland functions (e.g., floodwater retention and water purification) are truly local. That is, less retention of floodwater in the Illinois River watershed cannot be fully compensated for by more retention of floodwater in the Iowa River watershed. Similarly, the Corps strongly prefers "in-kind" to "out-of-kind" mitigation. For example, the Corps generally tries to mitigate the loss of a particular kind of wetland by requiring the restoration or enhancement of the same kind of wetland. One rationale for this preference is that the suite of species associated with each particular type of wetland differs from the suite of species associated with other types of wetlands. Requiring in-kind mitigation therefore attempts to maintain ecological values.

A final preference is to mitigate through restoration or enhancement. The preference of restoring and enhancing wetlands over creating them reflects scientific doubts about being able to create fully functioning wetlands where they never occurred naturally. The preference of restoring and enhancing over simply purchasing or preserving existing wetlands recognizes that mitigating the loss of some wetlands by purchasing or preserving others guarantees a net loss of existing wetlands and their associated functions and values. Thus, under the Clean Water Act, the old notion of measuring environmental losses and mitigation gains by the currency of human "user days" has largely been abandoned. Later we will consider whether the principles that are now well established for wetland mitigation are equally relevant to endangered species mitigation.

The Potential Benefits of Mitigation Banking: A Theoretical Review

Project-by-project mitigation, in which on-site, in-kind mitigation measures are drawn up for each new project affecting wetlands, has a number of potential drawbacks, for both regulated and conservation interests. First, designing an appropriate mitigation element for each new small development project is costly, as one cannot take advantage of economies of scale when designing small mitigation sites to compensate for small development projects. Second, the restoration and enhancement of wetlands are uncertain arts; if development projects proceed concurrently with mitigation efforts, the development may be complete long before one can determine the success or failure of the mitigation effort. Third, even if successfully established, small and often isolated mitigation wetlands may be seriously degraded over time by the invasion of exotic species, illegal dumping, off-road vehicles, and other threats. Without some mechanism to "defend" and manage these mitigation sites over the long term, they may cease to provide the full range of functions and values for which they were intended.

Wetland mitigation banking was developed to overcome these deficiencies in traditional mitigation and to create opportunities for entrepreneurial landowners to profit from wetland conservation.[5] Essentially, wetland mitigation banking is the creation, restoration, enhancement, or preservation of wetlands in advance of any specific project requiring mitigation, with the "credits" earned from such efforts made available to meet the mitigation requirements for future projects of the same or a different landowner. State highway departments initiated most of the early wetland mitigation banks. Looking into the future, they knew that they would have a continuing need to mitigate wetland losses as they built more new highways. Rather than develop postage-stamp-sized on-site mitigation projects for each new highway project, they looked for a means of mitigation that was both more efficient for them and more beneficial for the environment. One large-scale wetland restoration effort was often cheaper, on a per-acre basis, than many smaller projects.

Proponents of wetland mitigation banking asserted that the environment would also benefit, for at least three reasons. First, mitigation banking offered the opportunity to locate mitigation sites where they would offer a significant environmental benefit, rather than at the site of the proposed development, which might or might not have such benefits. Second, by consolidating the mitigation for many small projects into one large mitigation site, banking could secure certain environmental benefits (e.g., complexity of habitats, viability of populations, buffering from edge effects) unattainable at smaller sites. Finally, if mitigation banks extended credits only after demonstrating success in creating, restoring, or enhancing wetlands, then banking could offer a means of improving the generally poor record of traditional mitigation.

The Results of Traditional Mitigation: A Practical Review

The track record of traditional, project-by-project wetland mitigation is dismal. One example is a 1991 study done for the South Florida Water Management District that examined more than one hundred projects that required some form of wetland mitigation,[6] but for which the mitigation was actually carried out for only forty. The mitigation for thirty-one of them required the creation of wetlands. A total of 1,058 wetland acres were to be created for the thirty-one projects, but only about half the acres (531) were actually created. The study also found that thirty-two of the forty mitigation sites had been colonized by undesirable plants. Furthermore, only three of the sites had long-term management plans. Finally, although postconstruction monitoring was required at nearly every site, it was never done at fifteen of them.

Whether these results should properly be considered a failure of traditional mitigation or, rather, a failure of the government to monitor and enforce traditional mitigation

[5] Environmental Law Institute, *Wetland Mitigation Banking* (Washington, DC: Environmental Law Institute, 1993).

[6] K. Erwin, *An Evaluation of Wetland Mitigation in the South Florida Water Management District*, vol. 1 (Erwin Consulting Ecologist, Inc., Fort Myers, FL: Report for the South Florida Water Management District, West Palm Beach, FL, 1991).

requirements, the outcome is still the same. Traditional, project-by-project wetland mitigation has often not lived up to its promise.[7] Benjamin Tuggle, a former U.S. Fish and Wildlife Service field supervisor in Chicago, explained why wetland mitigation in urbanizing areas so frequently fails:

> The typical project requiring mitigation is a residential or commercial development impacting several acres of wetland. The mitigation typically is sited in a basin which also provides stormwater detention or compensatory floodplain storage, both of which involve large influxes of contaminated urban stormwater. Water quality is often limiting in these situations, and the large water level fluctuations preclude the establishment of normal wetland hydrology. These basins typically become shallow open water ponds, providing few wetland functions. Because they are small and usually surrounded by development, they provide little in the way of wildlife habitat. For similar reasons, it is difficult to find appropriate entities to take over management responsibilities, so there usually is no provision for long-term management and stewardship. All of these factors result in a high failure rate.[8]

Problems with wetland mitigation are not unique to federal programs but plague state programs as well. A recent example is a study of mitigation results in Massachusetts under that state's generally well regarded Wetlands Protection Act.[9] The goal of the

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[7] See, e.g., C. C. Holland and M. E. Kentula, "Impacts of Section 404 Permits Requiring Compensatory Mitigation on Wetlands in California," *Wetlands Ecology and Management* 2 (1992):157-169; R. J. Reimold and S. A. Cobler, *Wetlands Mitigation Effectiveness*, Contract 68-04-0015 (Boston: U.S. Environmental Protection Agency, 1985); M. L. Quammen, "Measuring the Success of Wetlands Mitigation Banking," *National Wetlands Newsletter* 8 (1986): 6-8; and C. E. Maguire, *Wetland Replacement Evaluation*, Contract DACWQ-65-85-D-0068 (Norfolk, VA: U.S. Army Corps of Engineers, 1985). A somewhat more sanguine assessment of wetland mitigation efforts is contained in Siobhan Fennessy and Joanne Roehrs, "A Functional Assessment of Mitigation Wetlands in Ohio: Comparisons with Natural Systems" (Ohio EPA Final Report to the Environmental Protection Agency, June 1997). Based on ten mitigation wetlands, this report concluded that more wetland acres were established at the mitigation sites than were lost at the impact sites, although the acreage established at the mitigation sites was somewhat less than required by the mitigation ratio of 1.5:1 required for the ten sites. Furthermore, there was no significant difference in the overall floral diversity at the mitigation and reference sites, although much of the diversity at the mitigation sites was composed of nonnative species. The study also concluded that "from a functional perspective, mitigation projects are not yet measuring up to natural sites with respect to flood water retention, water quality improvement and habitat provision," although some of these differences may have been due to the relatively young age of the mitigation sites (all were between two and five years old).

[8] B. N. Tuggle, April 18, 1996, letter to John Ryan, reprinted in U.S. Senate, Committee on Environment and Public Works, Hearing on Wetland Mitigation Banking, March 14, 1996, S. Hrg. 104-644, pp. 160-161.

[9] Stephen Brown and Peter Veneman, "Compensatory Wetland Mitigation in Massachusetts" (September

Massachusetts study was to generate more recent and more statistically reliable information than that contained in a 1989 Corps of Engineers study that found a 36 percent failure rate for wetland "replication" (i.e., creation) projects in the state. The later study examined 391 mitigation projects in forty-four randomly selected towns, including site visits to 114 projects. It found that 54.4 percent of the projects did not comply with regulatory requirements and that 38.6 percent had produced no wetland at all. Many of the failed projects were designed as stormwater detention basins, but because they were either too wet or too dry, the basins often failed to create a wetland. In nearly 22 percent of the projects examined, no wetland had even been built; for a nearly identical proportion of projects, a wetland was built but was smaller than required.

Another significant finding of the Massachusetts study was that "the plant communities in replicated wetlands differed significantly from those in wetlands they were designed to replace." Although a majority of the projects for which mitigation was required affected forested wetlands, and creation of a forested wetland was the goal of a quarter of the projects, no forested wetland was successfully created at any mitigation site. Moreover, the study found that plant communities in the created wetlands did not become more like those at impact sites over time, even though the created wetlands were as much as twelve years old. In the words of the study, "This means that, at best, there is a significant temporal loss of wetland function for at least 12-15 years following creation of a replication site, and this loss may possibly last much longer." The study also found evidence suggesting that "replicated wetlands are becoming drier over time."

Both the impacted wetlands and the mitigation sites included in the Massachusetts study were generally quite small; nearly 80 percent of the impacted wetlands were less than five thousand square feet (slightly more than a tenth of an acre). A few somewhat larger projects (up to two acres) were authorized as "variance projects." According to the study, these larger variance projects were "comparable to pilot mitigation banks or other centralized mitigation approaches." Interestingly, all the variance projects were found to be in compliance with regulatory requirements and "were much more carefully designed," although the plant communities associated with them were, again, different from those at the impacted wetlands.

In addition to the biological problems associated with the mitigation sites, the study uncovered deficiencies in program administration. "Some projects that were clearly not in compliance, including two that were never built, had been issued certificates," indicating that they were in compliance. The study also found that "most towns are not systematically tracking the progress of replication projects and determining if they are in compliance with the regulations." Although Massachusetts regulations require that replicated wetlands function similarly to the wetlands they replace, this requirement "appears to be poorly understood by Conservation Commissions and by permit recipients,

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1998) (Massachusetts Agricultural Experiment Station report prepared for the Massachusetts Executive Office of Environmental Affairs).

and approval is routinely given for wetland replication projects that are designed to be dissimilar from the impacted wetlands in both structure and function."

The Massachusetts study shows that traditional wetland mitigation efforts often fail whether they are overseen by state or federal authorities. There are, as yet, no similar studies assessing the effectiveness of endangered species mitigation efforts. It is clear, however, that some of the facts contributing to the ineffectiveness of wetland mitigation efforts also are present in the case of endangered species mitigation. These include diffuse and poorly coordinated mitigation efforts, technical challenges, and limited resources for monitoring and enforcement.

It was because of difficulties like these and the repeated failure of traditional wetland mitigation efforts that the idea that wetland mitigation banking might be more successful took hold. Whether wetland mitigation banking will in fact achieve better results than traditional, project-by-project wetland mitigation is not yet clear. Nevertheless, some people are beginning to embrace endangered species mitigation banking as a better alternative than traditional approaches to endangered species mitigation. Before deciding whether they are right, we will consider some of the important similarities and differences between wetlands and endangered species.

Similarities and Differences Between Endangered Species and Wetlands

Many private landowners who want to earn income from their land or to hold onto it as a long-term investment regard wetlands or rare species as a liability rather than an asset. It is not the wetlands or the species themselves that pose a threat; rather, it is the potential land-use restrictions. Under the ESA, no one can "take" an endangered animal without a permit, and this prohibition against "taking" extends to activities that alter the animal's habitat. Land clearing, timber harvesting, and other habitat-altering activities may therefore expose a landowner to criminal penalties or civil injunction. Landowners whose land houses either endangered animals or plants may also be unable to secure any of the federal permits required for the activities they wish to carry out. From the landowner's perspective, then, any endangered animal may well be an "anima non grata."

For our purposes, the main similarity between wetlands and endangered species is that both are protected and thus, without a permit, cannot be harmed by a variety of activities. At the same time, there are some important differences between the two. Wetlands are relatively permanent features on the landscape, but many endangered species are only short-term occupants of any given parcel. For example, a wetland with threatened California red-legged frogs (*Rana aurora draytonii*) living in it remains a wetland even after nonnative bullfrogs have found their way to the site. Once the bullfrogs arrive, however, they are likely to displace the red-legged frogs. When the red-legged frogs are gone, the site will continue to be protected as a wetland under the Clean Water Act, but it will no longer receive protection under the ESA.

It is not just introduced species that contribute to the impermanence of many endangered species. The young stands of jack pines that serve as breeding habitat for Kirtland's warblers (*Dendroica kirtlandii*) stop supporting these endangered birds once the stands are more than about twenty years old. A parklike stand of older longleaf pine trees will serve as suitable habitat for the endangered red-cockaded woodpecker only as long as the hardwood understory is kept at bay through prescribed burning or other means. If the hardwood understory and the woodpecker's ideal open pine forest habitat are not properly managed, they will be transformed into an unsuitably dense mixed pine-hardwood forest. Small, isolated wetlands will likely persist on the land regardless of what happens to other, similar wetlands nearby. In contrast, however, a small patch of habitat supporting the endangered Bay checkerspot butterfly (*Euphydryas editha bayensis*) may be too small to continue doing so once nearby habitat patches have disappeared.

These examples illustrate a common and important difference between wetlands and endangered species habitats. In order for wetlands to remain wetlands, they often need only to be protected; they generally do not need to be actively managed (though active management may be needed to prevent their degradation by alien species and other factors). In contrast, many endangered species habitats must be actively and continuously managed in order to support endangered species. Simply "protecting" them by putting a fence around them and prohibiting human activities inside is not sufficient. Without active management, many endangered species habitats cease to be endangered species habitats and thus lose the protection they formerly had under the ESA. Without active management, wetlands also may suffer serious degradation, but they are unlikely to cease being wetlands altogether. Despite their degraded condition, they will continue to be protected against the full range of activities regulated by the Clean Water Act. This important difference has significant ramifications for mitigation strategies.

In addition to the inherent differences between wetlands and other endangered species habitats, there also are differences in the purposes of the federal programs that seek to conserve them that, too, can give rise to different mitigation strategies. For example, the goal that has guided wetland policy during the past decade has been "no net loss" of wetland acreage and function. Whereas measuring wetland function is difficult, measuring wetland acreage is easy. That is, if there are x million acres of wetlands in the United States today and will be x million acres ten years from now, the goal of no net loss (at least with respect to acreage) will have been achieved. The goal of the ESA, however, cannot be achieved simply by freezing the status quo. Rather, one must reduce the likelihood of extinction--or, conversely, increase the probability of survival--to a safe level. When a species is no longer in danger of extinction in the foreseeable future and is not likely to become so, it is considered to have recovered. This, in turn, allows it to be removed from the endangered species list.

Recovery requires that the threats to a species' survival be reduced. It does not necessarily mean an increase in the numbers or distribution of a species (though it usually does). Indeed, it may be possible for a species to decline in total numbers even as its likelihood of survival increases. This could happen, for example, if none of the habitat of

a declining species were initially under the sort of ownership that ensured the active management needed to perpetuate it. If, through public acquisition or otherwise, one could be assured that some of its habitat would be appropriately managed, that fact might improve its prospects of survival enough for recovery, even though the rest of the habitat (and the species occupying it) were lost.

For many endangered and threatened species, recovery objectives are often expressed as a number of populations of a given size occupying a secure habitat. To meet these objectives, it is not necessary for every occurrence of a species to be maintained where it now is. Instead, if occurrences of the appropriate size and distribution can be secured, the recovery goals can be achieved regardless of what happens to the smaller, more isolated populations. This fact makes the conservation of endangered species fundamentally different from the conservation of wetlands. It also provides opportunities for mitigation (and mitigation banking) under the ESA that are distinct from those for wetlands under the Clean Water Act. Before considering which policies would be most suitable, we should examine the policies governing wetland mitigation banking.

II. FEDERAL GUIDANCE FOR THE ESTABLISHMENT, USE, AND OPERATION OF WETLAND MITIGATION BANKS

Although wetland mitigation banking began in the early 1980s, it had no uniform federal guidance until 1993, when the U.S. Army Corps of Engineers and the Environmental Protection Agency issued "interim national guidance." Two years later, on November 28, 1995, the Corps, Environmental Protection Agency, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and Natural Resources Conservation Service jointly issued the more detailed, final "Federal Guidance for the Establishment, Use and Operation of Mitigation Banks."[10] This 1995 Guidance remains in place today as a comprehensive account of the policies, procedures, and criteria applicable to the use of mitigation banks to provide compensatory mitigation for authorized adverse impacts to wetlands under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

The 1995 Guidance reflects a generally positive view of wetland mitigation banking and begins by reciting a number of potential advantages of mitigation banking over individual mitigation projects, including

- The ecological advantage of consolidating what might otherwise be numerous small, unconnected mitigation parcels into a single, large parcel.

- The technical advantage of mustering greater financial and scientific resources with which to establish and manage mitigation bank sites than are typically available in connection with small, individual mitigation sites.

[10] 60 Fed. Reg. 58605 (November 28, 1995).

- The economic advantage of reducing permit-processing times and increasing the cost effectiveness of mitigation opportunities.

- The temporal advantage that mitigation banks offer, in that their mitigation measures are "typically implemented and functioning in advance of project impacts," thus improving the certainty of success.

- The administrative advantage to the agencies of reducing the burden of reviewing and monitoring mitigation projects.

- The programmatic advantage of providing a mitigation opportunity in circumstances in which mitigation might otherwise not be possible.

- The practical advantage of giving greater flexibility to permit applicants.

The 1995 Guidance is silent on the potential disadvantages of mitigation banking. It also does not explicitly discuss the conditions that must exist to realize the advantages. Instead, both the advantages and disadvantages are, to some degree, implicit in the criteria and other requirements of the Guidance.

The Basics of Establishing a Wetland Mitigation Bank

The 1995 Guidance describes both the procedural and the substantive requirements for wetland mitigation banks. In regard to procedure, the Guidance suggests that a mitigation banking initiative begin with informal discussions between a prospective bank sponsor and the appropriate agencies. Based on those discussions, if the prospective sponsor wishes to proceed, it submits to the Army Corps of Engineers a "prospectus," a very general statement of the sponsor's plans for the bank. The Corps then provides notice and a brief opportunity for the public to comment on the prospectus.

Submission of a prospectus triggers a formal agency review of the banking proposal. This formal review is conducted by a "mitigation bank review team" chaired by a representative of the Corps and composed of representatives of all the federal agencies with an interest in the proposed bank, as well as state, local, and tribal agencies with regulatory authority pertaining to the proposed bank. Working in consultation with the review team, the prospective bank sponsor next prepares a "banking instrument" that describes in detail the characteristics of the bank and how it will be established and operated. Among other things, banking instruments are typically used to address the geographic area to be serviced by the bank, methods for determining credits and debits, performance standards, monitoring plans, contingency and remedial responsibilities, financial assurances, and provisions for long-term management.

When completed, the banking instrument is signed by the bank sponsor and concurring members of the review team. By signing, each agency signals its agreement with the

terms of the instrument. The 1995 Guidance states that review teams should "strive to obtain consensus," but if a consensus cannot be reached, it gives "the responsibility for making final decisions regarding the terms and conditions of the banking instrument" to the chair of the team (i.e., the Corps). Once a bank has been established, the Corps also is responsible for authorizing the use of credits from the bank to mitigate specific projects. When exercising this responsibility, the Corps is to consider the comments of the other resource agencies, just as it is generally required to do for wetland permit applications.

Activities That Generate "Credits"

What must a wetland mitigation bank do to generate credits? The 1995 Guidance recognizes four categories of activities: creation, restoration, enhancement, and preservation. *Creation* refers to the establishment of a wetland where none existed. Technically, this is usually the most challenging, least certain, and most controversial of the mitigation activities.

Preservation refers to the protection of existing wetlands in perpetuity through legal and physical mechanisms. Technically, this is the least challenging and generally most certain of the mitigation options. Nevertheless, for reasons discussed later, the 1995 Guidance does not favor preservation as a source of mitigation banking credits but allows it only "in exceptional circumstances."

Restoration and *enhancement* refer to a potentially overlapping set of activities. Restoration can mean the reestablishment of a wetland at a site where one once existed but no longer does. Often, restoration is relatively easy and usually successful if it is simply removing drainage tiles or levees, or otherwise restoring hydrological conditions to a site with hydric soils capable of supporting wetland plants. Because the art of wetland restoration is better developed than that of wetland creation or enhancement, the 1995 Guidance specifies that "restoration should be the first option considered when siting a bank."

Restoration, however, is not limited to the reestablishment of wetlands at former wetland sites. It also includes the reestablishment of wetland characteristics and functions at a site where they still exist but are degraded. It is here that it begins to blend with *enhancement*, which refers to activities that increase wetland functions at an existing (though not always degraded) wetland. When restoration is given this meaning, both it and enhancement activities present a big challenge in quantifying the values gained and ensuring their comparability to those lost by the filling of wetlands elsewhere.

Creating a Currency: The Measurement of "Credits" and "Debits"

Although the 1995 Guidance explains reasonably clearly the types of activities that can generate credits in a wetland mitigation bank, it is far less clear about how those credits are to be quantified to compensate for the impacts on wetlands elsewhere. Recall that the 1995 Guidance requires the bank sponsor and the agencies on the "mitigation bank

review team" to agree on a "banking instrument." Among other things, the Guidance specifies that the banking instrument should address "methods for determining credits and debits." It does not say what those methods should be, other than to say that "an appropriate functional assessment methodology . . . acceptable to all signatories should be used." Such methodologies may include "Habitat Evaluation Procedures, hydrogeomorphic approach[es] to wetlands functional assessment, [or] other regional assessment methodolog[ies]." Whatever methodology is chosen, the Guidance makes clear that it should be used in assessing both credits and debits.

The assessment methodology ultimately used must have a common "currency" to ensure that the environmental gains from the mitigation activities and the environmental losses from the wetland-filling activities are measured consistently. The 1995 Guidance's preference is a methodology that measures both wetland acreage and "function." However, the Guidance does recognize that in some instances "an appropriate functional assessment methodology is impractical to employ" and that in such instances "acreage may be used as a surrogate for measuring function."

The use of acreage as a surrogate for more sophisticated measures of function is not a problem when the mitigation involves creating or restoring the same general type of wetlands as those being lost. Acreage does become a more problematic surrogate when the mitigation takes the form of preserving an existing wetland or of enhancing the functions of a degraded wetland. The practical and difficult question then is how to determine what amount of wetland enhancement or preservation at the mitigation site is equivalent to the loss of an acre of wetland at the impact site. However credits and debits are measured, the actual exchange of credits for debits requires yet another determination, the specification of a compensation ratio.

Determining Compensation Ratios

Among the many things to be specified in each banking instrument are "compensation ratios." The banking instrument should specify the number of bank credits required to be exchanged in order to compensate for each unit (however measured) of wetland loss. Surprisingly, though, the 1995 Guidance fails to consider this in any detail.

The virtual silence of the 1995 Guidance on the topic of compensation ratios might be thought to reflect an implicit assumption that in nearly every case the ratio will be one-to-one. A one-to-one ratio would ensure that each unit of wetland loss was replaced by a comparable unit of wetland gain. This approach would presumably be consistent with the stated goal of "no net loss" of wetlands governing the nation's wetland programs since 1990. In practice, however, compensation ratios are frequently set higher than one-to-one.

Although the 1995 Guidance offers few clues to setting compensation ratios at anything other than one-to-one, it does at least suggest that the likelihood of success in creating, restoring, enhancing, or preserving wetlands at the mitigation site should not influence

the absence of a ceiling on advance crediting in the Guidance has virtually ensured that mitigation bankers will bargain for as much advance crediting authority as they can get, which often leads to squabbling among the agencies on the mitigation bank review team.

If advance credits are issued, there will be at least a temporary loss of wetland functions before the mitigation actions meant to compensate for that loss take effect. The 1995 Guidance tries to balance this situation in two ways. First, it seeks to limit the duration of such temporary losses by specifying that "initial physical and biological improvements" associated with the advance credits "should be completed no later than the first growing season following initial debiting of a bank." Second, the Guidance suggests that it may be appropriate to impose higher mitigation ratios to compensate for such temporal losses.

This unexplored inconsistency between the practice of advance crediting, clearly allowed by the 1995 Guidance, and the definition of a mitigation bank found in that same Guidance is a source of tension between the regulatory agencies and the banking community. The definition refers to "a site where wetlands and/or other aquatic resources are restored, created, enhanced, or . . . preserved expressly for . . . compensatory mitigation *in advance of* authorized impacts to similar resources" (emphasis added). When advance crediting is allowed, however, the compensatory mitigation takes place *after* the authorized impacts, not before them. This obvious inconsistency is a good example of the tension between trying to apply an abstract model of mitigation banking with clear theoretical benefits, and the practical necessity of adapting that model to economic considerations that might sacrifice some of those benefits. Other similar tensions can be seen in the Guidance's discussion of on-site versus off-site mitigation.

Service Areas: On-Site Versus Off-Site Mitigation

In 1990, five years before the Guidance on mitigation banking, the Corps and the EPA signed a memorandum of agreement concerning mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. That memorandum expressed a preference for on-site mitigation over off-site mitigation. By definition, however, mitigation banks are a form of off-site mitigation. Nevertheless, the 1995 Guidance concludes that the 1990 memorandum "should not preclude the use of a mitigation bank when there is no practicable opportunity for on-site compensation, or when use of a bank is environmentally preferable to on-site mitigation." Although this formulation appears to limit the circumstances in which off-site mitigation would be appropriate, it must be remembered that the 1995 Guidance begins by reciting the many advantages, including several environmental advantages, that mitigation banking offers over traditional project-by-project mitigation. Thus, the preference expressed in 1990 for on-site mitigation may not in fact be as strong as it first appears. Indeed, the 1995 Guidance asserts that "in general, use of a mitigation bank to compensate for minor aquatic resource impacts (e.g., numerous, small impacts associated with linear projects;

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of operation. See Kathrin Ellen Yates, Mitigation Banking in Louisiana, 59 *La. L. Rev.* 591, 606 (1999).

the compensation ratio. In a lengthy discussion of the technical feasibility of mitigation efforts, the Guidance states that "when uncertainties surrounding the technical feasibility of a proposed mitigation technique exist, appropriate arrangements (e.g., financial assurances, contingency plans, additional monitoring requirements) should be in place to increase the likelihood of success." Because using a greater than one-to-one compensation ratio could serve as a hedge against the mitigation's possible failure, its omission from this list is surprising. The unstated premise, reflected in a number of places throughout the Guidance, is that the conditions attached to approved mitigation banks must virtually ensure their success. One place where the Guidance departs from this premise--and the only place where the adjustment of compensation ratios is addressed--is in its discussion of "advance crediting."

The Chicken or the Egg: The Dilemma of Advance Crediting

As described earlier, the 1995 Guidance begins by reciting a number of advantages that mitigation banks have over individual mitigation projects. Among these is that with banks, "compensatory mitigation is typically implemented and functioning in advance of project impacts, thereby reducing temporal losses of aquatic functions and uncertainty over whether the mitigation will be successful in offsetting project impacts." This statement contains some important qualifiers. First, instead of "always," bank mitigation is "typically" implemented and functioning in advance of project impacts. Second, the Guidance does not claim that banking arrangements "eliminate" all uncertainty about the mitigation's success; rather, such arrangements only "reduce" such uncertainty.

All these qualifiers would be unnecessary if the 1995 Guidance required that mitigation bank credits be earned and used only after the bank's creation, restoration, enhancement, or preservation measures had been proved successful. Instead, it authorizes the "limited debiting of a percentage of the total credits projected for the bank at maturity" before the successful achievement of the full wetland functions that are to be the basis for any credits. This practice, known as *advance crediting*, was a concession to the economic argument that prospective bankers often need to be able to generate some return relatively quickly in order to finance the costs of mitigation at a bank site, particularly when a large restoration or creation effort is planned at the site. While that argument may often be valid, it undermines one of the strongest arguments frequently offered for mitigation banking--that mitigation is first achieved and then "banked" for later use.

When the 1995 Guidance was originally proposed, it included an illustrative example in which a bank was allowed to sell 15 percent of its projected credit total in advance of the credit's maturing. The final draft, however, omitted the example and explained that the percentage of advance credits permitted for a particular bank would be decided on a case-by-case basis and "may be higher or lower than the 15 percent example included in the proposed guidance."[11] Although 15 percent (or any other figure) may have been arbitrary,

[11] Louisiana's wetland mitigation banking policy allows the sale of all credits as soon as a bank deemed "low risk" becomes operational. "High-risk" banks can sell a quarter of their credits in the first two years

For these reasons, the 1995 Guidance allows the preservation of existing wetlands to serve as a basis for generating mitigation credits under a variety of exceptional circumstances. These circumstances include situations in which existing wetlands "are under demonstrable threat of loss or substantial degradation due to human activities that might not otherwise be expected to be restricted." If, through preservation, a bank prevents the degradation of an existing wetland, then the difficult issue becomes how to quantify the credits. The Guidance specifies that credits in such circumstances "should be based on the functions that would otherwise be lost or degraded if the aquatic resources were not preserved, and the timing of such loss or degradation." In other words, the more imminent the anticipated threat to the existing wetland is, the greater the number of credits earned will be. In practice, this rule is often exceedingly difficult to apply. Because preservation typically protects a wetland from the loss of some, but not all, functions, the Guidance asserts that "a greater number of acres from a preservation bank" is usually required to compensate for a given loss than would be the case if the bank were based on restoration, creation, or enhancement.

The Use of Public Land in Mitigation Banks

The 1995 Guidance prefers that preservation not generate mitigation credits because existing wetlands already have the benefit of significant legal protection. Somewhat similar considerations arise when publicly owned lands are proposed as sites for mitigation banks. Public agencies that manage public lands, particularly those established for conservation purposes, commonly carry out a variety of environmental improvements, including wetland creation, restoration, or enhancement. If private parties finance such improvements, should they be able to earn mitigation credits for doing so?

The 1995 Guidance says yes but specifies that the number of credits in such circumstances "should be based solely on those values in the bank that are supplemental to the public program(s) already planned or in place." Put differently, "baseline values represented by existing or already planned public programs, including preservation value, should not be counted toward bank credits." This presents another, very difficult, variant of the familiar problem of quantifying mitigation credits. It also introduces a potentially troublesome new issue. A private entrepreneur entering into a cooperative arrangement with a public landowner to carry out a wetland restoration project on public land in order to generate credits has no land costs associated with the project. In contrast, a private entrepreneur who carries out a similar project on his own land must factor the cost of the land into the credit price. These public-private cooperative arrangements therefore have a competitive advantage. The Guidance never addresses this, though commentators have pointed to it as an undesirable outcome. It reduces the incentive for entrepreneurs to establish mitigation banks on their own land, and it gives public agencies an incentive to look to the private sector to fund environmental improvements on public land. Ultimately, it may shortchange the environment by providing a convenient rationale for reducing the public funding of environmental improvements on public land.

impacts authorized under nationwide permits) is preferable to on-site mitigation." Thus, for this class of activities, the Guidance actually reverses the preference expressed in the 1990 memorandum.

The rationale for preferring on-site to off-site mitigation is that many of the benefits that wetlands provide, and that the law protects, are inherently local. Floodwater retention, nutrient uptake, and other functions of wetlands may be replicable through wetland restoration elsewhere, but the replication of those functions at a distant mitigation site still leaves the original wetland site without the local benefits that the lost wetland formerly provided. Unless mitigation is carried out very close to the impacted site, some local problems (e.g., flooding and the loss of locally valued wildlife) may actually be exacerbated, notwithstanding the mitigation.

Although the 1995 Guidance declares that the use of a mitigation bank may sometimes be preferable to on-site mitigation, it still tries to limit how far from the impact site a mitigation bank may be located. It does this by requiring that the banking instrument specify a "geographic service area" within which credits from the bank can be used to compensate for wetland impacts. Service areas may be nearby watersheds, adjacent counties, or other areas close by. The determination of the service area has major implications for the bank's economic viability. In general, bank sponsors seek as large a service area as possible so as to widen the market of potential buyers. The preference of the federal resource agencies for on-site mitigation, however, pushes them toward smaller service areas, to keep the benefits of mitigation as close as possible to the site of the wetland losses. The delineation of a bank's service area, however, does not necessarily preclude the use of credits from the bank to mitigate for losses outside the service area. The 1995 Guidance does allow such use of credits "on a case-by-case basis, where it is determined to be practicable and environmentally desirable."

The Preservation of Existing Wetlands as a Source of Credits

The 1995 Guidance allows the preservation of existing wetlands to generate mitigation credits only "in exceptional circumstances." The rationale for this policy is that Section 404 of the Clean Water Act already protects existing wetlands from a broad range of destructive activities. To allow credits for preserving what is already substantially protected from most threats would thus produce a largely illusory benefit.

While the scope of harmful activities regulated under Section 404 is broad, it is not limitless, and some serious threats to the viability of wetlands are beyond its reach. For example, land uses on adjacent or nearby upland areas can substantially degrade wetland values by increasing siltation, adding polluted runoff, lowering water tables, or other means. Section 404 also offers no protection against the considerable threat of invasive, nonnative plants, such as melaleuca in Florida or purple loosestrife in the Midwest. These plants may not wholly eliminate an existing wetland, but they effectively destroy many of its critical functions.

Although the U.S. Fish and Wildlife Service (Service) was one of the agencies that promulgated the 1995 Guidance, it apparently had misgivings about allowing mitigation banks to be sited on public land, at least if that land were part of the National Wildlife Refuge System. Four years after the 1995 Guidance was drawn up, the Service published its own policy that it "will not allow the use of National Wildlife Refuge System lands for mitigation banks" under the Clean Water Act, although it may accept a successfully completed bank as an addition to a unit of the system.[12] The Service's policy also generally bars the use of refuge lands for traditional, nonbanking mitigation purposes. The rationale for the policy is that although some refuge lands may have been degraded by past activities, the Service is "authorized to restore degraded habitats within the National Wildlife Refuge System and . . . will be restoring these lands in the future, irrespective of off-Refuge development." The policy, however, does not absolutely prohibit the use of refuge lands for traditional, nonbanking mitigation purposes. An exception may be granted if, among other things, "the mitigation would result in significantly increased natural resource benefits, when compared to other appropriate, off-site mitigation options."

The Service's policy applies only to wetland mitigation under the Clean Water Act, explicitly stating that it "does not apply to threatened or endangered species." This is a somewhat puzzling exclusion, since the Service's authority to restore endangered species on refuge lands is no less clear than its authority to restore wetlands and is arguably more so. Section 7(a)(1) of the ESA imposes on the Service an affirmative obligation to use its various authorities also to conserve threatened and endangered species. No comparable statutory command requires the Service to restore wetlands.

The Use of Federally Funded Wetland Projects

A similar question is whether mitigation banks can be sited on land where wetlands have been restored or created with federal funding. The Wetlands Reserve Program and the Partners for Fish and Wildlife Program are two examples. The 1995 Guidance states that federally funded wetland conservation projects undertaken under such programs "cannot be used for the purpose of generating credits within a mitigation bank." Similarly, the Service's 1999 policy on the use of refuge lands states that "where habitats are protected or restored under" such programs, the Service "will not recommend, support, or advocate the use of such lands as compensatory mitigation, including mitigation banks" during the term of the agreement and may do so after the term of the agreement only "in limited and exceptional circumstances." The rationale for these policies, though not explained, appears to be that because such projects have been at least partially federally funded, private banking interests should not be able to sell mitigation credits for actions that would not have taken place were it not for the federal funding. That rationale is difficult to square with the fact that the 1995 Guidance allows mitigation banks to be sited on public (including federal) land. In those instances, there is also a public contribution to

[12] 64 Fed. Reg. 49229, 49233 (September 10, 1999).

the endeavor (in the form of the public land made available for the bank), yet the Guidance allows credits to be sold from banks sited on public land.

Many of the federally funded wetland restoration programs require a private landowner to maintain a restored wetland for a limited time only. The Partners for Fish and Wildlife Program, for example, typically requires a landowner to maintain a restored wetland for only ten years, after which he may fill it under the authority of a nationwide permit issued by the Corps. If a landowner with the right to fill a restored wetland under such a program elects to waive that right, it is not clear why such a waiver should not qualify as compensatory mitigation. Similarly, a wetland that has been restored under a federal program might subsequently be enhanced by actions undertaken without the aid of federal funds. Here, too, it is not clear why the fact that the wetland was originally restored with the help of federal funding should disqualify any later enhancement of it from earning mitigation credits. Examples like these may in fact be contemplated by the 1995 Guidance, which, despite its general prohibition against using federally funded wetland projects for mitigation banking purposes, does allow mitigation credit "for activities undertaken in conjunction with, but supplemental to, such programs in order to maximize the overall ecological benefit of the conservation project."

In-Kind Versus Out-of-Kind Mitigation

Should the loss of one type of wetland (e.g., a forested wetland), be compensated for by the creation or restoration of another type of wetland (e.g., a shrub/scrub wetland)? Such arrangements are known as *out-of-kind* mitigation. Although the 1995 Guidance is not in favor of them, it does not prohibit them altogether. Instead, it allows them if they are "practicable and environmentally preferable to in-kind compensation." An example of this is a type of wetland at a mitigation site that is "of greater ecological value to a particular region." The Guidance is more emphatic in its opposition to the use of nontidal wetlands to compensate for the loss of tidal wetlands. Although it singles out this particular form of out-of-kind mitigation for special disapproval, even then it stops short of prohibiting the practice altogether.

Out-of-kind mitigation arrangements present a special challenge in quantifying credits and debits, since by definition, one is dealing with apples and oranges. Implicitly, the 1995 Guidance recognizes that it may be environmentally desirable to compensate for the loss of relatively common and ordinary types of wetlands by restoring or protecting relatively more rare or valuable types of wetlands. Alternatively, the relative rarity or value of two different types of wetlands might be addressed through specially tailored mitigation ratios. The Guidance, however, gives no real direction on this difficult issue.

Can Credits Count Twice?

A central tenet of mitigation banking is that beneficial activities carried out at a mitigation site generate credits that compensate for harmful activities at an impact site. Once used, a credit is extinguished and may not be reused. It is hardly surprising, then,

that the 1995 Guidance asserts, in one of its few unqualified statements, that "in no case may the same credits be used to compensate for more than one activity."

Immediately following this statement, however, the Guidance goes on to say that "the same credits may be used to compensate for an activity which requires authorization under more than one program." It then cites a number of examples of other potentially relevant programs, including state or local wetland regulatory programs, the National Pollutant Discharge Elimination System program, and the Superfund removal and remediation programs. Although the Guidance does not specifically mention the ESA, it presumably would qualify as a program under which separate authorization, in addition to that required by the Clean Water Act, is needed for at least some activities.

Must Mitigation Commitments Be Permanent?

Filling a wetland is, in most cases, a permanent loss. To balance that loss, compensatory measures should be permanent as well. That, at least, is the conclusion of the 1995 Guidance, which generally stipulates that wetlands in a mitigation bank be protected in perpetuity through a conservation easement, title transfer, or similar arrangement.[13]

Once again, however, the general rule in the Guidance has exceptions. Less-than-permanent protection of the resources in a mitigation bank can be approved "in exceptional circumstances." One example given in the Guidance is for "coastal protection projects which prolong the ecological viability of the aquatic system." Although not offered as an example, less-than-permanent protection might also be appropriate when the impact site is unlikely to persist in perpetuity, such as might be the case as a result of nearby groundwater withdrawals, heavy siltation, or the invasion of exotic plants capable of destroying all or most wetland functions.

When less-than-permanent mitigation is approved, the 1995 Guidance makes clear that it should never "extend for a lesser time than the duration of project impacts for which the bank is being used to provide compensation." The Guidance clearly is aiming for a temporal balance between impacts and mitigation: permanent impacts must be counterbalanced by permanent conservation commitments; less-than-permanent impacts should be counterbalanced by conservation commitments that last at least as long as the impacts.

Financial Assurances

Because of the uncertainties inherent in most forms of wetland mitigation, there must be sufficient financial resources to monitor the success of the mitigation effort and to respond to problems. For the ordinary project-by-project mitigation, the failure to carry

[13] Louisiana's state wetland mitigation banking policy requires that wetlands in mitigation banks be subject to nonpermanent servitudes, from twenty to fifty years in duration, depending on the type of wetland. See Kathrin Ellen Yates, Mitigation Banking in Louisiana, ibid., 605, n. 103.

out the mitigation requirements or the failure of the mitigation itself may result in revocation of the permit that authorized the impact. Revoking a permit often has little practical value, however, because after the project is completed, the builder no longer owns the affected property.

An important feature of mitigation banking is that the responsibility for the successful implementation of the mitigation requirements is transferred from the developer to the bank. As a practical matter, this provides a better opportunity to ensure the mitigation's success, since the bank sponsor is more likely to remain on the scene for a longer time. The 1995 Guidance attempts to ensure the success of mitigation at approved banks by requiring that bank sponsors secure sufficient financial assurances to monitor and maintain the bank and to cover future contingencies. Such assurances can take the form of performance bonds, casualty insurance, or other mechanisms. Similar requirements are seldom imposed on those undertaking traditional project-by-project mitigation.

III. CALIFORNIA'S CONSERVATION BANKING POLICY

Background

The federal guidance on wetland mitigation banking is similar to the guidance of many states. Although many states have promulgated laws, policies, or regulations pertaining to wetland mitigation banking, only California has adopted a policy governing endangered species mitigation banking. The California policy was promulgated in April 1995 as an initiative of the then governor, Pete Wilson. The roots of that initiative can be traced to federal efforts, under the ESA, to protect a California songbird, the coastal California gnatcatcher.

In mid-1990, the Service began a formal review of the status of the gnatcatcher to determine whether it warranted protection under the ESA. That review set off alarm bells in southern California, as development interests there recognized that federal listing of this bird could have an enormous impact on them. The reason was straightforward. The gnatcatcher depended on coastal sage scrub habitat, and it was precisely that sort of habitat that was being rapidly converted to subdivisions, shopping malls, highways, and other uses throughout Southern California. Once the gnatcatcher was listed as an endangered or threatened species, further development could bump up against the stringent requirements of the ESA.

The gnatcatcher was just the tip of the iceberg, as dozens of other species were largely confined to coastal sage scrub habitat. These, too, were potential future additions to the federal endangered species list. Developers foresaw that even if they could satisfy the requirements applicable to the gnatcatcher, the subsequent listing of other species would put still more obstacles in their path. They desperately needed a solution that would relieve them from the need to run a new series of gauntlets as each new species was added to the list.

On Earth Day in 1991, Governor Wilson unveiled a new initiative that he called "Natural Community Conservation Planning" (NCCP). Its core idea was to initiate conservation planning on a broad geographic scale. The aim of such planning was to protect sizable and strategically situated parcels of land that could perpetuate an entire natural community, rather than just one or a few of its constituent species. The hope was that by doing so, species not yet on the endangered list would never be put on it and those already on the list could be protected in enough key places that they would no longer need the protection of the federal law. The first test of the new idea was to take place in southern California.

In September 1991, the Service formally proposed adding the gnatcatcher to the endangered species list. The following month, Governor Wilson signed into law the Natural Community Conservation Planning Act. Over the next eighteen months, the state and the Service worked to make sure that if the gnatcatcher were to be federally listed, the NCCP initiative could provide the framework within which the ESA's requirements would be met. In March 1993, the Service designated the gnatcatcher a "threatened" species. This designation enabled it to customize a set of regulations that promised relief to developers and local governments if they took part in the NCCP process.

The NCCP process initially divided the coastal sage scrub habitat into eleven planning subregions in five counties. Each subregion was to develop a habitat conservation plan (HCP) that met the requirements of the ESA and the NCCP law. While the subregional plans were being developed, a limited amount of incidental taking of gnatcatchers was allowed under the special regulations promulgated for that species.

It quickly became apparent that the strategy likely to be applied to all the subregional plans would be to establish a system of preserves. These preserves would be composed of "key" parcels that, because of their size, location, and other characteristics, had special conservation value. An important question then was how to generate the financing that would be needed to acquire these key parcels. Local governments in California had been prohibited from raising property taxes by Proposition 13, a voter initiative passed many years earlier that forced local governments to resort to more creative means of funding services and infrastructure. Although the state had land acquisition resources, these were almost certain to fall well short of what would be needed. Perhaps the owners of the key parcels might simply be prevented by regulatory action from developing them, but that approach would face the near certainty of litigation in support of a constitutional claim for compensation. It was against this backdrop that the idea of "conservation banking" began to receive attention.

Six months after the gnatcatcher was added to the threatened list, the Bank of America foreclosed on a 263-acre parcel in San Diego County known as the "Carlsbad Highlands." An appraisal at the time of foreclosure gave the parcel a low value, primarily because of environmental constraints, including the presence of coastal sage scrub habitat that limited its development potential. Facing major regulatory hurdles if it tried to develop the property, the Bank of America looked instead for opportunities to benefit from the

land's ecological value. At the same time, the state's highway department, CalTrans, was seeking ways to mitigate the impact on the gnatcatcher of one of its projects. Eventually, the two found each other. CalTrans bought eighty-three acres of the Carlsbad Highlands property and placed a conservation easement on it to mitigate its highway project.

The sale of a part of the parcel to CalTrans left the Bank of America with 180 acres of undeveloped and ecologically significant land, and it was eager to unload the remainder for a similar purpose. Because of the Bank of America's prominence in the state, it was able to draw attention to a new state policy that was about to be publicly unveiled.

On April 7, 1995, the heads of California's two principal environmental agencies, the Resources Agency and the California Environmental Protection Agency, jointly issued their "Official Policy on Conservation Banks." At the same time, the state announced that the Bank of America's Carlsbad Highlands property had been transformed into the first conservation bank created under the new policy.

Details of the Policy

California's "Official Policy on Conservation Banks" is a brief document with a broad scope. It provides guidance on the use of banks to compensate for impacts on both wetlands and endangered species, as well as on "Environmentally Sensitive Habitat Areas, mudflats, sub-tidal areas, and less sensitive resources." The broad scope of the policy reflects the several different environmental laws in California that may require mitigation, including the California Environmental Quality Act (mitigation required for projects that "substantially diminish habitat for fish, wildlife or plants"), the California Coastal Act (requiring applicants for projects along the coast to demonstrate that all feasible mitigation measures have been provided to minimize adverse environmental effects), and the California Endangered Species Act.

Interestingly, although all these various laws impose "mitigation" requirements, the policy never uses the term *mitigation banks*. Instead, it refers throughout to the banks it seeks to encourage as *conservation banks*. At least in part, this terminology reflects a conscious choice to try to avoid the controversy that long dogged the wetland "mitigation banks." By calling their banks something different, California policymakers apparently hoped that those who had already made up their minds about "mitigation banks" would be willing to take a fresh look at "conservation banks."

Apart from their names, however, there are few real differences. One rather conspicuous difference between the California policy and the federal wetland mitigation banking guidance is the treatment afforded "preservation" as a source of bank credits. Recall that under the federal wetland banking guidance, the preservation of existing resources is permitted as a source of credits only under "exceptional circumstances." Instead, the restoration and creation of wetlands are the preferred activities. Under the California policy, however, no presumption against preservation is made. Indeed, it is listed first among the four types of resource management that can generate credits. The others are

resource enhancement (the enhancement of a degraded resource), resource restoration (the restoration of a resource to its historical condition), and resource creation (the creation of a specified resource condition where none existed before). In practice, most of the conservation banks thus far approved in California simply preserve existing parcels and promise little or no resource creation, restoration, or enhancement.

Like the federal guidance, the California policy allows advance crediting, or the recognition and use of credits before the "full realization of the targeted resource value at the bank." The availability of credits is to be determined "in accordance with agreed upon performance criteria for the development of the resource value in question." The California policy has one distinctive feature with respect to credits, however. It provides that "upon sale of the first credit in the bank area or subarea, the land in the bank or subarea must be permanently protected through fee title or conservation easement." Since the policy requires that any bank and each of its subareas be "large enough to be ecologically self-sustaining or part of a larger conservation strategy that has a reasonable expectation of being accomplished," this stipulation serves an important conservation purpose: it ensures that the mitigation associated with any sale of credits will be neither too small nor too transitory to be ecologically significant.

From the point of view of California's bankers, however, the requirement to convey an easement over an entire bank area or subarea upon the sale of the first credit is problematic. According to interviews with several of them, they believe the resource agencies have no motivation to help complete the sale of credits in a bank once an easement is in place. Rather, the bankers believe that once the first credit has been sold and an easement is in place, the agencies will regard the site as locked into conservation and therefore prefer to seek new sites to lock into conservation rather than to direct project proponents to banks with remaining, unsold, credits. If the bankers' perception is correct, this requirement will ultimately be self-defeating for the agencies, since it will discourage entrepreneurs from entering conservation banking, exactly the opposite result from what the California policy seeks. In the meantime, bankers are trying to overcome this difficulty by writing into their banking agreements stipulations that will obligate the resource agencies to inform potential credit buyers of the availability of credits at their banks and that will require the agencies to give them a sort of "most-favored nation" guarantee. Such a guarantee would prevent the agencies from recognizing credits as having a mitigation value that is less on an acre-for-acre basis than that of any other mitigation banking or habitat mitigation credit program available for the same species in the same area.

Although the California policy says nothing about the use of existing public lands for conservation banking purposes, this issue soon came up when San Diego County asked for the views of both the California Department of Fish and Game and the Service about the suitability of county-owned lands for such purposes. The two agencies prepared a joint response concluding that several types of county land would not be appropriate for banking purposes, such as (1) land used as mitigation for a previous project; (2) land already designated or dedicated for passive park or open space use, when that use was

generally compatible with sustaining biological values; and (3) land acquired or given for park or natural open space purposes. This response does not seem objectionable if preservation is the only activity that the bank is contemplating: the position of the two agencies prevents the use of lands already committed to preservation. A somewhat different response might have been appropriate for banks contemplating resource creation or enhancement. As mentioned earlier, the federal wetland mitigation banking guidance recognizes this distinction and allows mitigation credits to be earned on publicly owned lands, but "based solely on those values in the bank that are supplemental to the public program(s) already planned or in place."

The joint response of the California Department of Fish and Game and the Service to San Diego County's request illustrates the coordination between these two agencies. Although the California policy on conservation banking does not have the Service's imprimatur, the two agencies did jointly issue in 1996 its "Supplemental Policy Regarding Conservation Banks Within the NCCP Area of Southern California." This supplemental policy, which begins by noting that the two agencies "support the creation of conservation banks," largely fills in some of the interstices of the state policy, including that the number of banks will be determined by the free market rather than by the agencies and that banking agreements should specify the service areas within which their credits may be used. It also tries to offer some guidance on what has become a contentious issue regarding the interchangeability of species and their habitats. According to the supplemental policy, in general only in-kind mitigation (involving the same habitat and species) is permitted. However, an exception to this in-kind mitigation requirement will be made when "the bank is located within a jurisdiction that has an approved subarea plan, or if the wildlife agencies determine that the bank achieves regional conservation goals." That exception was at issue in the only litigation thus far concerning endangered species mitigation banking.

Litigation

The premise of the NCCP program was that it would focus on distinctive natural communities (like the coastal sage scrub), rather than on their constituent rare species. The ESA, however, focuses on individual species, generally prohibits their taking, and requires mitigation when their taking is allowed. Natural communities can sometimes usefully serve as a rough surrogate for the individual species generally associated with such communities, but the fit is not always precise. For example, if a landowner develops a one-hundred-acre parcel of coastal sage scrub habitat that is occupied by California gnatcatchers, it is by no means clear that the loss of this particular habitat could be satisfactorily mitigated under the ESA by protecting another one-hundred-acre parcel that is not occupied by gnatcatchers (although even an unoccupied parcel may be of conservation value if, for example, it is situated in a key corridor connecting major occupied sites). Yet the NCCP process tries to avoid this very need to account for each and every species on each and every parcel.

This issue surfaced recently in the only court challenge thus far to an endangered species mitigation bank. In *San Bernardino Valley Audubon Society v. Metropolitan Water District*,[14] the narrow issue decided was whether the creation of an endangered species mitigation bank required the preparation of an "environmental impact report," or "EIR," under the California Environmental Quality Act (under this law, an EIR is essentially analogous to an "environmental impact statement" under the National Environmental Policy Act). Although the trial court found no need for an EIR, the court of appeals reversed the trial court's decision.

The mitigation bank in the *San Bernardino* case was established by the Metropolitan Water District (MWD) primarily for its own future projects in southern California. However, the agreement creating the bank anticipated that there would likely be credits in the bank beyond those needed for the MWD's projects and provided that these could be sold to third parties. It was this potential for sale to third parties that most concerned the court, plus the fact that the bank purported to provide mitigation for projects affecting some sixty-five different "target species." In order to establish an equivalence of values when mitigating the impacts of future projects by the purchase of credits from the bank, the agreement adopted "a complex habitat value formula to match habitat values in affected outside project areas to the available mitigation bank credits."[15] The parties had different interpretations of how this complex formula was to work in practice, and the court declined to analyze it in detail. Nevertheless, in a key passage, the court concluded that there was "a fair argument that mitigation banking on a habitat basis will allow for a result different from an acre-for-acre or specie-by-specie [*sic*] exchange." To illustrate its concern, the court offered the following example: "If an outside project has six endangered or threatened species on one acre, it appears . . . that the habitat value equivalent of one acre of the mitigation bank could be used to provide mitigation for all six species. This compression of habitat could have a significant effect on the six species."[16] The court went on to agree with the plaintiff's concern that significant effects were possible because "occupied habitat may be replaced by unoccupied habitat in the mitigation bank."[17]

The court's decision would appear to create a significant problem for using habitat-based rather than species-based mitigation banks, at least when the habitat encompassed more than one species of concern. Since a major goal of the NCCP was to design a system of reserves that in their aggregate would meet the conservation needs of a whole suite of ecologically associated species without the need to account for each and every species on each and every parcel, the court's decision potentially undermines the ability to use mitigation banks as part of the NCCP's strategy. However, it may be noteworthy that the case addresses only the California Environmental Policy Act and not the California or federal Endangered Species Acts. The court did not rule on the compatibility of the

[14] 83 Cal. Rep. 2d 836 (1999).
[15] *Id.* at 843.
[16] *Id.* at 846.
[17] *Id.*

mitigation bank with the requirements of either of those laws. It held only that the bank's approval required the preparation of an EIR because there was a "fair argument" that the approval would have a significant effect on the environment.

Notwithstanding the recent court decision, banks continue to be established under the California banking policy. Some appear to have had notable success, whereas others have struggled. The case studies in Appendix I illustrate both the challenges and opportunities that have faced conservation bankers in California.

IV. RECOMMENDED POLICIES TO GOVERN ENDANGERED SPECIES MITIGATION BANKING

The ESA prohibits the "taking" of endangered animals, a prohibition that has been interpreted quite broadly to include the destruction of habitat under some circumstances. This prohibition, however, is not absolute. The government may permit landowners (and others) to take endangered species incidental to otherwise lawful activities. To secure such a permit, a landowner (or other entity) must prepare an HCP that mitigates the impact of the authorized taking.

Three basic approaches to mitigation are reflected in HCPs. The simplest is a plan for a single landowner to take prescribed measures on his own land to mitigate the impacts of the authorized activity. This approach is functionally equivalent to the traditional project-by-project, on-site mitigation typical of the Clean Water Act's implementation.

A much more complex mitigation scheme is representative of the many HCPs initiated by local governments on behalf of some or all landowners in their jurisdictions. A common arrangement under these HCPs is for the local government to agree to purchase identified land parcels and to manage them for conservation purposes. In return for that mitigation, landowners whose land has not been identified for acquisition can develop it as they choose. Often, the funds for the acquisition and management of the conserved parcels are generated from special assessments levied on other land as it is developed. These arrangements are thus closely akin to the "in lieu" mitigation arrangements widely used under the Clean Water Act. Under these, in lieu of actually performing wetland mitigation, a developer pays a predetermined sum to a public or private conservation agency, which then uses the money to support wetland conservation activities.

The third form of mitigation is mitigation banking. This is the acquisition (usually by purchase from a third party, at a negotiated price) of conservation "credits" that have been recognized by the appropriate regulatory agency (typically the Service) as a result of some action--such as the preservation, creation, restoration, or enhancement of habitat. This sort of private entrepreneurial mitigation banking is exemplified by the "butterfly bank" mentioned in the opening paragraph of this report. Thus far, mitigation banking has been used relatively infrequently under the ESA, although interest in it appears to be growing.

Although the Service has authorized the purchase of credits from various banks to mitigate adverse impacts to endangered species, it has not yet issued any formal or informal policies with regard to endangered species mitigation banking. As just described, the state of California's 1995 "conservation banking" policy purports to govern wetlands, endangered species, and certain other forms of mitigation banking. The federal wetland mitigation banking guidance and the California conservation banking policy differ significantly. Whether either of these serves as a good model for the development of federal endangered species mitigation banking policy is open to debate. It is clear, however, that any effective federal endangered species mitigation banking policy must address at least those issues explored next. The recommended resolution of these issues is given in the draft mitigation banking policy in Appendix II.

Should the Preservation of Existing Habitat Generate Mitigation Credits?

Federal wetland mitigation banking policy strongly discourages the preservation of existing wetlands as the basis for generating bank credits and favors the restoration of former wetlands or the enhancement of degraded wetlands. When preservation is accompanied by restoration, creation, or enhancement, the federal policy allows the generation of credits for the preservation if "it is demonstrated that the preservation will augment the functions of the restored, created or enhanced aquatic resource." However, the "preservation of existing wetlands . . . may be authorized as the sole basis for generating credits . . . only in exceptional circumstances." The rationale for this policy preference is that most existing wetlands are already "protected" (at least from being filled) by Section 404. Thus, the preservation of already protected wetlands as mitigation for the loss of other existing wetlands would result in a net loss of wetlands.

Do the same policy considerations apply to endangered species habitats? Should an endangered species mitigation banking policy also generally prohibit the preservation of existing habitats as a means of generating credits? The California conservation banking policy has no comparable provisions against mitigation through preservation, and most of the conservation banks established in that state simply preserve existing habitats. At first glance, there appear to be some important differences that may justify an approach more receptive to preservation in the case of endangered species. First, habitat that is currently not occupied by an endangered species is also not protected by the ESA, yet it may nevertheless be valuable for the species in the future. Preserving suitable but currently unoccupied habitat may make it more likely for the species to expand its current distribution and to recover. Second, there is no prohibition against taking endangered plants and therefore no prohibition against destroying their habitat. That is, endangered plants and their habitat are not "protected," at least not off federal land. Finally, although endangered animals benefit from the ESA's taking prohibition, that prohibition is no guarantee that today's habitats will still be tomorrow's. Successional change, catastrophic events, and even the absence of natural disturbances can result in the long-term or permanent loss of endangered species from the habitats they now occupy. Once endangered animals are gone, the law's taking prohibition no longer matters.

Based on these considerations, any formal policy governing endangered species mitigation banking should embrace preservation as an appropriate means of generating credits, though it should note that in some exceptional circumstances, preservation may not be appropriate. For example, if currently occupied habitat is likely to continue to be occupied more or less indefinitely without active management, then the protection afforded that habitat by Section 9 of the ESA may be sufficient to ensure the site's long-term protection. In those circumstances, agreement by the landowner to protect a site that is already, as a practical matter, likely to be protected anyway, should not give rise to mitigation credits.

Because endangered species habitats often require some form of active management to continue their value to endangered species, a mitigation banking policy should require that preservation of existing sites be accompanied by a strong management commitment (and the resources to fulfill it). Without a commitment to manage and the resources to do so, mitigation credit could be given for sites that will eventually cease to offer any benefit to the species they were intended to help conserve.

How Large Should Endangered Species Mitigation Bank "Service Areas" Be?

Federal wetland mitigation banking policy generally prefers that banks "service" nearby areas, usually in the same watershed. That is, banks should provide mitigation credits to offset the loss of wetlands in the same watershed (or smaller area).[18] The rationale for this policy is that wetlands provide many site-specific benefits (e.g., stormwater retention, groundwater recharge, pollution filtration, biodiversity, and recreation) that cannot be replaced by compensating in another watershed. Do valid policy considerations dictate a similar approach for endangered species?

Again, the differences between wetlands and endangered species may justify a different result. First, except for aquatic species, "watersheds" do not often serve as useful demarcations for endangered species. Second, if the ESA's goal is to improve the survival prospects of a species sufficiently that it can be considered recovered, that goal is to some degree independent of where a species is found today. Although endangered species offer significant local benefits, the ESA is not principally concerned with those local benefits. Rather, its overriding concern is that a species be sufficiently secure in enough places that it is not likely to become endangered again in the foreseeable future. To meet this goal, it may be enough to ensure the species' survival in some, but not all, the localities where it now occurs.[19]

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[18] Federal interagency guidance recommends that wetlands mitigation bank service areas be "guided by the cataloging unit of the 'Hydrological Map of the United States' (USGS 1980) and the 'Ecoregions of the United States' (James M. Omernik, EPA, 1986) or section of the 'Descriptions of the Ecoregions of the United States' (Robert G. Bailey, USDA, 1980)." The guidance recognizes, however, that there may be circumstances in which it is appropriate to use "other classification systems developed at the state or regional level." (Guidance, Part II, D. 3.).

[19] The point made here is not inconsistent with the ESA's broad purpose of "provid[ing] a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved." Even

These considerations suggest that recovery plans or similar undertakings should guide the determination of bank service areas. For example, many recovery plans set goals of establishing one viable population on protected habitat in each of several identified geographic areas.[20] At a minimum, those geographic areas should serve presumptively as banking service areas: banks located in a given area can sell credits to offset impacts elsewhere in the same area. In some circumstances, however, credit trading across recovery areas might serve recovery goals (e.g., when recovery goals for the red-cockaded woodpecker have been met in the Sandhills regions of North Carolina, future mitigation for impacts in the Sandhills could properly go toward meeting recovery goals in others areas where recovery goals have not yet been met). Such an approach would both hasten the recovery of endangered species and enhance the economic viability of mitigation banks.

Where no recovery plan exists, or where it fails to specify recovery goals for specific areas, the location of mitigation banks is probably more important than the delineation of their service areas. Typically, the goal should be to locate mitigation banks where they can support (or contribute to) viable populations by linking or buffering already protected areas. By securing these linkages or bufferings, recovery prospects for an imperiled species may be improved, notwithstanding the loss of habitats elsewhere that are isolated and too small to support viable populations. Thus, in these circumstances, the service area is essentially unlimited, with strategically sited banks able to sell credits to offset impacts anywhere else that the species occurs. The important point, however, is that such banks must genuinely be "strategically sited," with a particular conservation objective clearly in mind.

What Is the "Currency" for Mitigation Banking Credits and Debits?

An important and difficult issue in wetland mitigation banking is establishing a common currency for valuing credits created by restoration, enhancement, or other activities at the bank site and similarly valuing what is lost at the impact site. Wetland mitigation policy seeks to ensure no net loss of wetland "function," but in the absence of a clear measure of function, acreage often serves as a rough surrogate for it. How should the currency of credits and debits be measured in the case of endangered species mitigation banks? Will the answer to this question be different for each species? Would it ever be appropriate to

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that purpose does not require that each and every occurrence of a listed species be maintained. Many endangered species occupy entirely artificial habitats, species such as interior least terns (*Sterna antillarum)* that nest on ash islands in power plant ash ponds, or peregrine falcons (*Falco peregrinus*) that nest on bridges and office buildings. Others occupy habitats that may once have been self-maintaining but no longer are, such as many fire-adapted habitats in areas where roads and agricultural fields act as a barrier to the movement of fire.

[20] Examples include the recovery plan for the golden-cheeked warbler (*Dendroica chrysoparia*), which has a goal of one viable, self-sustaining population in each of eight specified regions of Texas, and the recovery plan for the interior population of least terns, which has specific numerical goals for each of five designated areas.

use some measure of habitat as the currency, without knowing the precise extent of use of that habitat by a particular species? Any useful policy governing endangered species mitigation banking must resolve these issues.

In theory, any action that either hurts or helps an endangered species can be reduced to a common currency, the likelihood that the species will survive for some period of time. If we assume that a particular endangered species has a 50 percent probability of surviving for another hundred years and that a proposed development action would, if unmitigated, reduce its survival probability to 40 percent, then mitigation measures would fully compensate for the development impacts if they restored the species to a 50 percent survival probability.

Unfortunately, as a practical matter, our ability to quantify precisely current survival probabilities and the impacts of helpful or harmful actions is rudimentary to nonexistent. But even though they cannot quantify such probabilities precisely, regulators nevertheless base many of their mitigation requirements on intuitive or crudely quantified assessments of such probabilities or use a convenient substitute. For wetland mitigation, wetland acres often serve as a convenient surrogate for a more sophisticated assessment of functions and values lost and gained. For endangered species, acreage is more of a problem, because the value of any given acre to a particular endangered species *always* depends on a host of variables. These variables include configuration, the size of the habitat patch of which it may be a part, its proximity to other habitat patches, its position upwind or downwind of pollution sources, the presence or absence of exotic species, its overall condition, and others. We have no neat formula by which to weight each of these many variables and produce a meaningful index value to assign to the acre.

Because of these difficulties, the practice of existing mitigation banks varies widely. A recent agreement establishing a North Carolina Department of Transportation bank for the red-cockaded woodpecker refers to mitigation credits without ever defining what they are. The International Paper agreement profiled in Appendix I concludes that a credit is earned when a new "active cluster" (i.e., a spatially associated group of trees with one or more cavities currently being utilized by one or more red-cockaded woodpeckers) is established at the mitigation site. Under the proposed Saipan Upland Mitigation Bank, also described in Appendix I, a mitigation credit consists of protecting habitat associated with an existing pair of nightingale reed-warblers (*Acrocephalus luscinia*), plus enhancing sufficient unoccupied habitat to provide the conditions needed by a pair of reed-warblers. Some of the conservation banks in California equate credits with acres of a particular type of habitat preserved or destroyed. These varied approaches reflect not merely the absence of a clear policy but also the practical reality that the varied circumstances and needs of particular species will inevitably produce different "currencies" to define bank credits and debits.

Should Mitigation Banks Generate Credits for Activities on Public Lands?

Federal wetland mitigation banking policy limits the use of mitigation banks on publicly owned lands. Part II.B.2 of that policy provides that banks may be sited on public or private lands. However, the policy goes on to say that credits generated by mitigation banks on public lands "should be based solely on those values in the bank that are supplemental to the public program(s) already planned or in place, that is, baseline values represented by existing or already planned public programs, including preservation value, should not be counted toward bank credits." On September, 10, 1999, the U.S. Fish and Wildlife Service issued a policy that generally prohibits compensatory wetland mitigation on National Wildlife Refuges because the Service is already "authorized to restore degraded habitats within the National Wildlife Refuge System and . . . will be restoring these lands in the future, irrespective of off-Refuge development." Ironically, in the case of endangered species, it is not uncommon for the Service to approve HCPs in which the mitigation for the loss of habitat on private land is carried out on public land, including federal land, even though federal land managers are also authorized (indeed, arguably required) to restore and improve habitats for endangered species on their land.

The argument for allowing mitigation on public land is that public agencies may lack the resources to carry out the restoration, enhancement, or management activities on their land that would help endangered species. Supplementing agency budgets with revenues derived from mitigation assessments enables conservation activities to be completed sooner on public lands than would otherwise be the case. That argument is sometimes true, yet it is troubling. There is a danger that the private resources contributed by the banker will not simply supplement agency budgets but will also displace them. As revenues for conservation management from private banking sources rise, appropriated public funds for those same activities may fall. To the extent that happens, the apparent mitigation on public lands will fail to compensate for losses elsewhere. This is especially worrisome in the case of federal lands, because of the affirmative duty imposed on federal agencies by the ESA to promote the conservation of endangered species. Another concern is that allowing banks to be located on public lands (federal or nonfederal) may create incentives for entrepreneurs to enter the banking business, but it does not create an incentive to use private land for conservation purposes.

For these reasons, a formal policy governing endangered species mitigation should generally disallow the use of federal lands for mitigation purposes, including mitigation banking. For other public lands (e.g., state or local), a formula similar to that in the federal wetland banking interagency guidance seems appropriate. The number of credits in such circumstances "should be based solely on those values in the bank that are supplemental to the public program(s) already planned or in place."

Should Mitigation Credits Be Sold Before They Are Earned?

Federal wetland mitigation banking policy allows limited "advance sales" of credits (i.e., credits can be sold before the mitigation has been successfully carried out) in order to

capitalize the banks. Bankers cite the need for a more liberal allowance of advance credit sales as a financial necessity, whereas many environmentalists urge that no credits be given until the mitigation is a proven success. Are the considerations different for endangered species than they are for wetlands? This is not an issue when the preservation of existing habitats generates mitigation credits, because the credits are earned as soon as the site is dedicated to conservation purposes. Note also that landowners who have created, restored, or enhanced endangered species habitat under "safe harbor" agreements may be able to become mitigation bankers by relinquishing their rights to remove the habitat improvements they have made.[21] When the habitat has been improved under a safe harbor agreement, the concern about advance credit sales also disappears, because the credits are realized as soon as the landowner gives up his rights to return to baseline conditions under the safe harbor agreement.

In other circumstances, when a bank wants to earn credits by restoring or enhancing currently unoccupied habitat, the question of whether any credits should be available for sale before the restoration or enhancement has begun (or before its success has been demonstrated) should perhaps hinge on whether the restoration or enhancement techniques are well established and known to be generally successful or whether they are largely experimental. If they are well known and generally successful, advance credit sales could be permitted with greater confidence. Conversely (and probably more typically), if they are experimental and the likelihood of their success is highly uncertain, advance credit sales should not be permitted. A formal endangered species mitigation banking policy should try to reflect these principles, though any rule short of an absolute prohibition against advance credit sales will unavoidably put a considerable amount of discretion in the hands of those who implement the policy at the field level.

Should Mitigation Credits Be Given Only for Permanently Protected Habitat?

Federal wetland mitigation banking policy requires that once all the credits in a bank have been sold, the underlying property must be given permanent protection through deed transfer or conservation easement. Should that same policy always apply to endangered species mitigation banking, or in some circumstances can a less-than-permanent-protection arrangement legitimately generate credits?

Some endangered species occupy early successional habitats that in time will mature and no longer support those species; other endangered species may survive on sites that are so small and so isolated that the species has a low probability of remaining on the site much longer. Once such habitats are no longer occupied by an endangered species, no ESA prohibitions encumber those sites, at least according to how the law has been interpreted thus far. Therefore, when the owners of such sites want to develop them and are required to mitigate that development, it is at least an open question whether the required

[21] For more information on "safe harbor" agreements, see the U.S. Fish and Wildlife Service's and National Marine Fisheries Service's recently published joint policy on that subject, at 64 Fed. Reg. 32717 (June 17, 1999).

mitigation should necessarily be in the form of a site protected in perpetuity. One might address this problem in either of two ways: (1) compensating for the loss of transitory habitats with less-than-permanent mitigation or (2) insisting that mitigation always be permanent but adjusting the mitigation ratios downward when the habitat being lost is transitory. A formal endangered species mitigation banking policy should probably favor the permanent protection of the mitigation site while allowing one or both of the preceding options in appropriate circumstances.

Whatever the duration of the mitigation commitment, it is important to have in place both the resources and an effective mechanism for maintaining the biological values of the mitigation site throughout that period. Often, mitigation sites are subject to edge effects from incompatible land-uses on neighboring lands. Others suffer from a policy of "benign" management resulting in erosion, invasion by exotic plants, and a lack of physical security. When such sites are near population centers, active management is often necessary to prevent the loss of the very values that the sites were established to preserve. It is critical, therefore, that the expected costs of future management needs be assessed and that sufficient financial resources be available to meet those costs.

The basic yardstick for deciding how much is needed is the average annual cost of management over the long term. The objective is to establish a funding source that provides enough income to cover annual stewardship costs and that also keeps pace with inflation. Unfortunately, there is no easy way to determine this, and managers around the country are struggling to devise formulas for calculating these costs. The costs vary widely with the nature of the land, the type of ownership (fee or easement), the scope of permitted activities (public use, education, etc.), and year-by-year circumstances. California has a system of establishing expected management costs and the size of endowments needed to meet them that is widely used by both public agencies and nonprofit land trusts. This system was developed by the Center for Natural Lands Management and is known as the "Property Analysis Record" (PAR).

The PAR is a computerized database methodology that helps land managers calculate the costs of land management for a specific site. It does this by analyzing the characteristics and needs of the property from which the management requirements are derived. It helps specify the management tasks and estimates both their costs and the necessary administrative costs. The PAR generates a concise report that serves as a well-substantiated basis for long-term funding, including endowments. The development of the PAR was funded by the U.S. Environmental Protection Agency and the David and Lucille Packard Foundation. Seminars on its use have been funded by the National Fish and Wildlife Foundation.

Sequencing and Mitigation

As a general matter, wetland impacts must be mitigated in a prescribed sequence: first avoiding impacts, then minimizing unavoidable impacts, and finally compensating for the remaining impacts. The federal wetland mitigation banking policy purports to be faithful

to this policy, although some conservation interests worry that the practical effect of the mitigation banks is to tempt regulators to skip rather lightly past avoidance and minimization and proceed instead directly to compensation in the form of purchasing credits from a bank. Bankers deny that this is the case but urge that the policy be less demanding with respect to sequencing. The argument for sequencing is that every wetland is important and that our ability to compensate for wetland losses through restoration and enhancement (or wetland creation) is imperfect at best.

Are those arguments as persuasive for endangered species? The idea that it is always better to protect any habitat that is currently occupied by an endangered species than to compensate for its loss elsewhere is hard to defend, given that many currently occupied habitats are practically indefensible in the long run because they are too small, too degraded, or too isolated to contribute meaningfully to the recovery of the endangered species now occupying them. Even though our ability to create, restore, or enhance habitats for endangered species is clearly imperfect, in some cases it may be less imperfect than our ability to maintain currently occupied habitats so that they remain occupied.

Perhaps because of these differences between wetlands and endangered species, there has never been, for endangered species mitigation purposes, a formal sequencing requirement comparable to that used for wetlands. It is worth noting that whereas avoiding wetland impacts serves the stated goal of no net loss of wetlands, merely avoiding endangered species impacts does not necessarily advance the goal of recovering imperiled species. By itself, it simply perpetuates the existing, unsatisfactory status quo. In most instances, to enable recovery, those areas currently lacking formal legal protection or beneficial management must receive it, and those areas not currently occupied by endangered species must become occupied, or both. Unless public funds to accomplish this are made available, the only alternative may be to do so through well-designed mitigation programs that trade other areas less important to the recovery of the species. For these reasons, endangered species mitigation banking policy need not track the sequencing requirements found in the wetland banking guidance.

Should Banks Be Available Only for Some Kinds of Impacts?

Some wetland mitigation banks can sell credits to compensate for wetland losses in connection with only some kinds of projects. For example, some can sell credits only to mitigate the impacts of small projects authorized by nationwide general permits; others can sell credits only for projects affecting wetlands beyond the Corps's jurisdiction (but still regulated by state or local laws). The rationale for these limitations is that larger projects should mitigate on-site wherever possible, whereas mitigation for very small projects on-site is often expensive, of little ecological value, and likely to fail. Thus, banks provide a convenient mitigation alternative for the less sophisticated and less wealthy "little guys" who are attempting to satisfy Section 404's requirements. Should endangered species mitigation banks also be designed primarily to serve little guys (e.g., those that qualify for "low-effect" HCPs)?

Although some banks may be purposely designed to cater to some subset of projects requiring endangered species mitigation, there does not appear to be a compelling reason that endangered species mitigation banking policy should limit the availability of bank credits to any particular category of potential purchasers. As a practical matter, bigger projects affecting larger areas may have more on-site mitigation opportunities available to them, but even for these projects, the alternative of buying credits from a strategically located and well-designed bank may yield greater environmental benefits.

Public and Private Banks

Wetland mitigation banks may be either publicly or privately owned. Private bankers complain that publicly owned banks compete unfairly because (1) they use underpriced public goods; (2) they are sometimes owned by the same agencies that act as regulators, who can steer permittees toward their own banks rather than the private banks; and (3) public banks are generally not required to meet the same financial assurance requirements that private banks must meet (e.g., posting of performance bonds).[22] Some independent observers echo these criticisms and urge that public agencies stay out of the banking business (other than to generate credits for their own internal use). Should endangered species mitigation banking policy allow or encourage both public and private mitigation banks?

Some public endangered species mitigation banks (e.g., the North Carolina Department of Transportation bank) may be established primarily or exclusively to meet the future mitigation obligations of the public agency establishing the bank. Unless they sell credits to private, third parties, they do not compete with private mitigation banks in any meaningful sense. Conversely, the proposed Saipan Upland Mitigation Bank is a public bank established for the purpose of facilitating private development by selling mitigation credits to private developers. Its circumstances, however, are unique because of the legal restrictions on who may own land in the Commonwealth of the Northern Mariana Islands. Elsewhere, publicly owned mitigation banks offering credits to third parties could stifle the development of genuine entrepreneurial banks. Although that would be an undesirable result, preventing it by means of an outright prohibition against public banks could have undesirable conservation consequences, too, particularly if the market for endangered species mitigation banking remained too uncertain to attract much private investment. To the extent that mitigation banking policy addresses this issue at all, it ought to seek to minimize the potential conflicts of interest in which public agencies serve as both regulators and mitigation bankers.

[22] John D. McKinnon, "Banks Blast Government for Selling Wetland Credits," *Wall Street Journal*, August 11, 1999.

Uniformity Versus Spontaneity

Federal wetland mitigation banking policy imposes uniform requirements on federally approved mitigation banks. The process of creating banks is prescribed; their basic elements are delineated; and other features are mandated in a policy that stresses uniformity rather than creativity, flexibility, and spontaneity. Should that also be the case for endangered species, or are the circumstances concerning endangered species too varied, the experience with mitigation too limited, and the potential for banking too fluid to warrant similar uniformity? Should endangered species mitigation banks be allowed to develop more or less spontaneously out of safe harbor agreements or other arrangements?

At least initially, the argument for spontaneity appears persuasive. An endangered species mitigation banking policy should aim at preventing potential abuses and securing real conservation gains. At the same time, however, it should avoid overly prescriptive and rigid rules that are unlikely to fit well with the many different circumstances that a host of different endangered species with highly varied needs will present.

SELECTIVE BIBLIOGRAPHY

In addition to the sources cited in the footnotes, the following bibliography identifies information sources that should be useful to anyone seeking a greater understanding of mitigation banking. Although the literature on mitigation banking is now extensive, almost all of it pertains to wetland mitigation banking, with as yet, nearly no published literature on endangered species mitigation banking.

Although dated, one of the most comprehensive sources of information about wetland mitigation banking is

Environmental Law Institute. *Wetland Mitigation Banking*. Washington, DC: Environmental Law Institute, 1993. 159 pp. plus appendices.

In addition to its own insightful analysis, this report includes an extensive annotated bibliography. A revised version of this report is included with the several studies done as part of the National Wetland Mitigation Banking Study by the Institute for Water Resources of the U.S. Army Corps of Engineers. The several reports that comprise that study are available from the Corps or can be downloaded from the web at

http://www.wrsc.usace.army.mil/iwr/currpt.htm

Several of the reports in the National Wetland Mitigation Banking Study were written before the 1995 federal guidance on wetland mitigation banking. This Guidance is thoughtfully and critically examined in

Gardner, Royal C. Federal Wetland Mitigation Banking Guidance: Missed Opportunities, 26 *Envt'l L. Rep.* 10075-10079 (February 1996).

A longer and more detailed account of the guidance and the history that led up to it is by the same author,

Gardner, Royal C., Banking on Entrepreneurs: Wetlands, Mitigation Banking, and Takings. 81 *Iowa L. Rev.* 527-587 (1996).

Another post-Guidance source of useful information about wetland mitigation banking and the various perspectives on it can be found in the following two recent congressional hearings:

Hearings on Wetlands Mitigation Banking Before the Senate Committee on Environment and Public Works. March 16, 1996, S. Hrg. 104-644, 104th Cong., 2d sess., 242 pp.

Hearings on Wetlands Protection and Mitigation Banking Before the Subcommittee on Water Resources and Environment of the House Committee on Transportation and Infrastructure. December 9, 1997, H. Hrg. 105-49, 105th Cong., 1st sess., 135 pp.

The state of California not only has the only statewide policy on mitigation (or "conservation") banking that includes endangered species, but it also maintains a website where much information on that subject can be found. The website includes the official state policy, related press releases and explanatory material, and a catalog of conservation banks approved in the state. Unfortunately, the information in the catalog of approved banks has not been regularly updated and therefore must be used with caution. The website address is

http://ceres.ca.gov/topic/banking/

A good reference that spans wetland mitigation banking and the California conservation banking efforts is

Marsh, Lindell L., Douglas R. Porter, and David A. Salvesen. *Mitigation Banking: Theory and Practice*. Washington, DC: Urban Land Institute, 1996. 300 pp.

Although there is still relatively little information about mitigation banking specifically for endangered species, two references worth consulting are

Toyon Environmental Consultants, Inc. "Conservation Banking--A Technical Report." Prepared for the California Department of Fish and Game and the California Wildlife Foundation with funding from the Ford Foundation. Undated. 24 pp.

Lawhead, David. "Bucks in the Bank . . . Land Bank That Is." *Outdoor California* (July-August 1997), pp. 4-8.

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APPENDIX I: CASE STUDIES OF SELECTED ENDANGERED SPECIES MITIGATION BANKS

This appendix presents brief profiles of six endangered species mitigation banks. The first three are based in California, where mitigation banking for endangered species conservation purposes has been used far more widely than elsewhere. Under a 1995 state policy initiated by then Governor Pete Wilson, California's "conservation banks" are specifically encouraged in areas where they support continuing regional habitat conservation strategies. Comparable to wetland banks, a conservation bank is privately or publicly owned land managed for its natural resource values. The banks are normally based on habitat and designed to conserve a number of rare species.

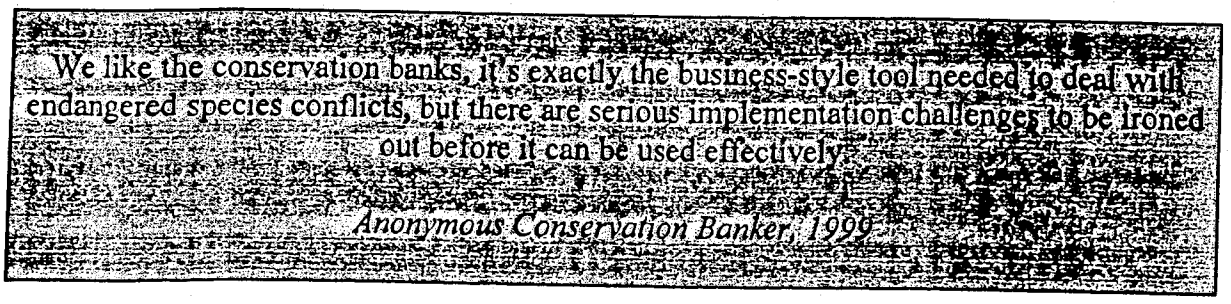
It is not surprising that endangered species banking should have gotten its start in California. It is the state with the second largest number of such species, and it has a pressing need to find creative new approaches to the growing conflict between growth and protection of the natural environment. Early architects of California's conservation banking policy describe endangered species banking as a combination of mitigation banks created to create, restore, or enhance wetlands and a totally new form of natural resource banking focused on species and habitats.

California's new enterprise, Natural Community Conservation Planning (NCCP), is designed to protect threatened and endangered species at the scale of the natural community. The proving ground for the program is the coastal sage scrub natural community and the range of plant and animal species that occupy this habitat mosaic across five southern California counties covering six thousand square miles. The NCCP is intended to be an improvement on the prior model of project-based, single-species conservation efforts. Under this new approach, wildlife agencies identify areas of important habitat for conservation before they are degraded or jeopardized by development. Planning is on a regional basis in order to maintain areas large enough to retain species diversity. Each subregion and locality is expected to contribute a share to the reserve system, and each has a predominant role in land-use planning.

One of the NCCP's goals is to identify the funding for, and secure the management of, reserve lands from public and private sources. Conservation banks were originally envisioned as a tool to provide long-term protection of habitat and to offer landowners economic incentives to protect natural resources. Because the planning is on a large regional level and then broken down into a subregions and subareas, the region and the community know where the preserve system will be. The conservation banks are part of the effort to consolidate environmental mitigation requirements and apply them to high-priority sites for maximum regional environmental benefit.

Thus far, the NCCP has been the impetus for more than twenty conservation banks in California. Because the center of this tool has been San Diego County, we explore its

advantages and disadvantages in two conservation banks from that area, the San Vicente and Manchester Avenue Conservation Banks. The Kimball Island Mitigation Bank, in the delta of the San Joaquin and Sacramento Rivers, is an example of a quite different bank that seeks to restore a mix of aquatic and riparian habitats. Of the remaining banks briefly summarized, two are for the red-cockaded woodpecker (the Southlands and Champion International Banks) and one is located on the island of Saipan in the South Pacific.



The San Vicente Conservation Bank

The San Vicente Conservation Bank started as a "feel-good" story, but its ending is still uncertain. The bank became the dream of the Boys and Girls Clubs of the East County Foundation after a wealthy donor deeded the land to the group. Without the associated costs of purchasing the land, the foundation hoped to finance its recreational, cultural, and physical education programs for disadvantaged youth by creating the bank from what had been a fifteen-hundred-acre cattle ranch.

The East County Foundation is a nonprofit organization with a mission "to inspire and enable all young people, to realize their full potential as productive, responsible and caring citizens." Other nonprofits have used the conservation banking tool in California, including The Nature Conservancy, the Trust for Public Land, and the American Land Conservancy. The experience of the Boys and Girls Clubs has been mixed and provides many useful lessons concerning the pitfalls as well as the opportunities of banking.

Biologically, the area of the San Vicente Conservation Bank is exceptional. The 320-acre bank is dominated by high-quality coastal sage scrub and southern mixed chaparral communities and houses numerous pairs of the threatened California gnatcatcher. It is located near a great deal of open space and undeveloped land, some private and some public, in the vicinity of the Sycamore Canyon County Open Space Preserve and the San Vicente Reservoir and along the boundary with the Iron Mountain Preserve. The bank is relatively undisturbed and requires minimal management such as maintenance of fencing and signage, control of exotic plants, removal of trash, and patrolling for trespassers which is done voluntarily by friendly, but protective, neighbors. Since the land required no real enhancement, the anticipated credits were for preservation rather than restoration activities.

In regard to administration, the bank's house is in order. It has been formally approved by both the California Department of Fish and Game (Department) and the U.S. Fish and Wildlife Service (Service) under the state's conservation banking policy in an implementation agreement signed in 1996. The first phase of the bank has been transferred to an experienced nonprofit bank manager, The Environmental Trust (TET), which is responsible for all monitoring and management. The Department holds the easement for the land, which is considered a core biological area within the regional preserve of the Multiple Species Conservation Plan, one of the first subregional plans approved under the NCCP program. The San Vicente Bank is considered high-quality habitat for both regional and subregional planning.

The bank's general marketability is solid, if not outstanding, in the very competitive credit environment of San Diego County. It has 320 conservation credits for sale on a one-to-one basis for Diegan sage scrub, threatened and endangered species, and general multispecies habitat values. The bank's service area includes all of San Diego County except for coastal species and habitats as well as certain rare endemic and endangered species. The bank does contain cismontane alkali marsh habitat, but its coverage has not been estimated because it has not been approved as a wetland mitigation bank under Section 404 of the Clean Water Act of Section 1600 of the California Fish and Game Code. The foundation has the exclusive right to determine the price for any and all credits. The TET maintains the numerical accounting of credits sold in a calendar year and is responsible for reporting on both this information and the bank's management and monitoring.

The bank's initial financial security was assured through its short-term management activities when the foundation paid TET $25,000. All but $5,000 was placed in an investment program designed to earn interest to pay the bank's annual maintenance. The endowment was expected to be permanently funded through the sale of conservation credits, and the long-term management fee assessed for the site was $450 per acre--the management costs are low because the site is physically secure. Any net proceeds above that $450 would have paid for gyms, clubhouses, and gang and drug prevention programs for the foundation. If all credits had sold as expected, the total endowment would have been $128,000, which would have been paid directly to TET to manage the land in perpetuity for conservation purposes.

With all these apparent assets, the bank should have been first in line for credit sales, particularly because it was one of the first banks in the area, being approved in 1996. The bank was at a disadvantage, however, by being some distance from the center of San Diego County's expanding development, and thus it has not been able to sell many of its credits--a great disappointment to its sponsors.

What do the experiences of the San Vicente Conservation Bank tell other habitat bankers? The foundation had a solid enterprise, except for two factors crucial to the success of any bank. First, it could not predict how the local government would respond to the region's habitat goals. Second, the bank became a casualty of the county's land-

use trends. In theory, the NCCP is supposed to be a driver for regional efforts to create a reserve system in which the wildlife agencies could combine the reserves based on the development taking place across the county and focusing on broader habitat goals.

Despite its huge formal service area for credits, the actual market for the San Vicente Bank is more local. Because the various cities and towns in San Diego County must meet certain quotas regarding land set-aside for the reserve system, they prefer that all development be mitigated within their boundaries, which reduces the service area considerably. When they meet their quota, the localities do not want to encourage any more banks because open space is not on the tax rolls. And since Proposition 13 was passed, localities increasingly rely on revenues from development to build and maintain basic and new infrastructure.

Because many of the banks are phased--that is, one separate block of habitat is committed at a time--as soon as a phase's economic value exceeds that of a conservation bank, the risk/reward ratio is such that the other phases may not develop. At this point, therefore, the foundation is exploring other uses for its remaining land, including an off-road vehicle park. If the credits do not sell, the Department is the backup guarantor for the bank, which is not completely endowed. In addition, the potentially valuable wetland credits are not available to the foundation. The three agencies involved in bank approvals, the Service, the Department, and the Army Corps, have not agreed on how to provide for these types of credits in a conservation bank.

"Looking back on my experience, I am not sure I would recommend that my clients get involved in conservation banking. While I was involved with many of the early banks and it always takes time to work out the kinks in policy, the problems still remain and I can't say I think it is worth the time or the money to do it again in San Diego County. It's really too bad because I had many people who truly believed they could make a business out of saving the environment and making some money. This would have been a real win-win for all of us."

Anonymous, Banking Consultant, 1999

The Manchester Avenue Conservation Bank

The 124-acre Manchester Avenue Conservation Bank located in Encinitas, California, has long been in private hands. Tech-Bilt, Inc., a thirty-year-old family development enterprise in San Diego County, was the original property owner. The company is run by a father, brother, and sister and had owned the land for twenty-five years. Although the concept of conservation banking was new to this family, they understood from the wildlife agencies and their own biologists that they owned something very special.

Manchester is an important corridor to the El Cajon open space. It contains coastal sage scrub habitat, an extremely rare type of southern maritime chaparral (SMC) habitat, and

some very rare plants, including the San Diego thorn mint (*Acanthomintha ilicifolia*), Del Mar manzanita *(Arctostaphylos glandulosa* var. *crassifolia)*, and the Del Mar sand-aster (Lessingia *filaginfolia var. linfolia*). The last of these was proposed for listing under the ESA, but the proposal was later withdrawn because the Fish and Wildlife Service concluded that it was not taxonomically distinct. The property also houses four pairs of threatened California gnatcatchers as well as orange-throated whiptail lizards (*Cnemidophorus hypeythus*). Long before the listing of the California gnatcatcher that initiated the NCCP regional process, the company had been made aware of this property's special value and had started to look for alternatives to building homes on it.

Because its basis in the land was very low, Tech-Bilt had more options for earning a competitive economic return from its bank. Prompted by the publicity surrounding the Bank of America's conservation bank, it investigated both conservation banking and the more usual forms of development. It chose conservation banking because the property's regional significance under the NCCP made it unlikely that the company could develop it in a reasonable time period without significant time, cost, and complexity. But according to its calculations, even with those associated costs, the company would have still obtained a higher return from development. After talking with the wildlife agencies, Tech-Bilt and its consultant were able to agree on a higher credit ratio for portions of the land because of the rarity of the SMC. For the most part, credits in San Diego conservation banks are distributed on a 1:1 to 1:1.05 basis. However, the SMC was so rare that the credits went for 1:1.8. Tech-Bilt eventually retained twenty-three credits for its own use and has sold almost all the remaining bank credits.

Like the San Vicente Bank, Tech-Bilt hired a very experienced bank manager, the Center for Natural Lands Management (CNLM), to manage and monitor its bank, although it has an outside vendor that is responsible for selling its credits. The CNLM is the trustee for the management endowment fund, and the California Department of Fish and Game holds the easements. It is common in San Diego County for outsiders to sell and market conservation credits. With twenty or more banks, this is an extremely competitive market, and it is necessary to track mitigation needs regularly to keep up with local development trends. Although the bank is clearly identified, it is in the midst of high-density residential development and is therefore subject to considerable public use. The bank's main challenges are controlling particularly tough exotic species, including acacia and pampas grass, downward discharges from surrounding residences, erosion from existing easements through the property, and trespassers. No enhancement of the site is anticipated.

How does this bank differ from the San Vicente Bank, with an almost identical credit area? First, the Manchester Bank has a rarer and more threatened type of natural community that has made it more competitive regionally. It is at the center of the development boom in San Diego County. In regard to the San Vicente Bank, the idea of a regional service area truly has been an unrealized dream, given the pressure on local jurisdictions both to contribute to the regional preserve system and to find sources of infrastructure revenue. In regard to the Manchester Bank, however, the city of Encinitas

was interested in preserving the land as its contribution to the subregional Multiple Species Habitat Conservation Plan for this portion of San Diego County. Thus, the great advantage the San Vicente bank had was simple--location, location, location.

It took both banks a very long time to complete the negotiations and banking instrument, and consequently, the length and complexity of negotiations have led to less formal means of generating mitigation credits. A secondary market for conservation lands also has begun to develop across the county. Prospective conservation bankers have chosen not to go through the onerous process of negotiating agency approvals to obtain formal approval for their banks. Instead, they trade back and forth for appropriate mitigation lands. Although the agencies dislike this "swap-meet" approach and cannot guarantee that the mitigation will be acceptable, it continues nonetheless. One large, well-respected conservation organization complained bitterly (but anonymously) that it would never again participate in a conservation bank because of the lack of coordination among the agencies on things like credit ratios--because it "took too long." Interestingly, this comment was not made only in San Diego but in other parts of the state as well. In sum, the process is exhausting.

In San Diego, each banking instrument is negotiated anew, although the Department has developed a template for transactions and some excellent guidance for bankers. In other parts of the state, the fighting over mandates between the ESA and the Clean Water Act standards seems to be the source of the delays. Because of problems like these, every banker in the state with whom we talked, with one exception, said that the agencies do not speak with one voice and that they would hesitate to become involved again in developing a bank. One banker claimed to have spent $200,000 on just the regulatory review process and wondered what a small, underfunded, unsophisticated banker would do in similar circumstances.

The Kimball Island Mitigation Bank

The Kimball Island Mitigation Bank is located in the San Joaquin Delta (Delta) at the confluence of the Sacramento and the San Joaquin--two of California's largest rivers. The U.S. Army Corps of Engineers (Corps) authorized its creation in March 1998. The bank was designed to provide mitigation cognizable under Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, Section 10(a) of the ESA, and several California laws.

The bank presents a particularly interesting story, for several reasons. First, it has a significant area of coverage both geographically and in terms of habitat and species. Second, it is unusual because of the Corps's relatively central role in initiating its development, even though many bankers complain they cannot get the agencies to cooperate with them. Third, unlike the two previously discussed banks, this one entails substantial restoration. Fourth, it presents fairly some of the biggest challenges to the development of such banks, that is, agency disagreements regarding credit ratios and

mandates. Finally, the company that created the bank is widely recognized in the state as being a model economically and biologically for conservation banking.

The bank is made up of approximately 90.6 acres of aquatic habitat and 14 acres of adjacent riparian habitat, a total of 105 acres. In consultation with other federal and state regulatory agencies, the Corps determines the eligibility of projects that may use the bank for off-site mitigation after all the sequencing is complete.

The general service area for the bank is in the boundaries of the Delta and the main stem of the Sacramento River to river mile 200. However, it may also provide compensatory mitigation for certain endangered species in six Central Valley counties.

Kimball Island offers credits for impacts to a wide variety of federal and California-listed endangered, threatened, and rare plant and animal species and their associated habitat. As discussed earlier in this report, the state has a parallel system of environmental regulation that requires mitigation based on the California Endangered Species Act and California Environmental Quality Act. Unlike the federal ESA, the state's endangered species law regulates the taking of plants (though many exceptions dilute the rigor of that regulation). This system of parallel, but not always intersecting, regulation; the location of the Kimball Island Bank in a rapidly developing region; and its habitat values all contribute to the comparably lengthy list of species and habitat covered by the bank.

Among the species covered are a number of imperiled fish, including the Delta smelt *(Hypomesus transpacificus),* longfin smelt *(Spirinchus thaleichthys),* Sacramento splittail (*Pogonichthys macrolepidotus*), chinook salmon (*Oncorhynchus tshawytscha)*, and a federally listed population of steelhead (*Oncorhynchus mykiss).* Kimball Island is an ideal location for a bank in terms of salinity levels and the types of conditions needed for the fish, including shaded riverine aquatic bed habitat. The listed fish species are particularly threatened by freshwater exports from the two rivers, urban and agricultural nonpoint discharges, and the loss of shallow water and spawning habitat.

The plants covered by the bank include the Delta tule pea (*Lathyrus jepsonii* var. *jepsonii),* Mason's lilaeopis (*Lilaeopis masonii),* Suisun aster *(Aster lentus),* and Sanford's arrowhead *(Sagittaria sanfordii).* Compensatory mitigation also is available for birds like the California black rail *(Laterallus jamaicensis coturniculus),* yellow-breasted chat *(Icteria virens),* and Suisun song sparrow (*Melospiza melodia maxillaris*).

Under the terms of the federal guidance on mitigation banking, the Corps takes the lead on the mitigation bank review teams. Because of the spiraling demand for development permits in this rapidly growing region of California, the Corps recognized a growing need to compensate for the impacts on many rare species in the Delta, most notably the Delta smelt and chinook salmon. It approached Wildlands, Inc., a nonprofit organization engaged in restoration efforts, because of its concern that the demand for off-site compensatory mitigation would outstrip the supply.

The restoration of Kimball Island was challenging because it was technically complex and needed the cooperation of area farmers, many of whom were under economic pressure to convert their croplands to housing developments or other uses. The restoration was facilitated by the fact that although Kimball Island had previously been used for agriculture, it had lain fallow long enough for a number of the old agricultural ditches to revert to wetlands. Unfortunately, the ditches were deep, with steep vertical banks that provided neither good habitat for fish nor a complete connection between the adjacent waters and the rest of the land. In addition, few native plants remained on the island. But despite the disturbed and degraded land conditions, both Wildlands, Inc., and the Corps believed the site was a good candidate for restoration because even after breaching the perimeter levy, two to three feet of the island would remain above sea level.

Wildlands, Inc. began the restoration in 1998. The design objective for the bank is to create vegetative communities closely resembling the Delta's historic aquatic, wetland, and riparian habitats. Wildlands studied the adjacent natural areas for clues to replicate existing or historical conditions and to create a similar area. This included restoring and enhancing the marsh and weedy uplands to make the habitat more diverse and improving connectivity to adjacent aquatic environments. By creating gradually smaller fingers within the channel, Wildlands wanted the old agricultural ditches to begin operating as sloughs. The largest logistical challenge was that because the work was being done on an island, it was necessary to use excavators mounted on barges. So Wildlands had to find specialized equipment with tracks rather than wheels so as not to disturb habitat further.

Before the bank could move forward, Wildlands approached the agricultural community to determine whether there would be any opposition to converting the island to a bank. Representatives of the Delta Protection Commission, a group of farming interests, did not object to the conversion because of the size of the site and its unsuitability for agriculture.

The biggest hurdle to achieving consensus on the banking instrument was persuading the agencies to agree on the credit ratios. Because the island contains so many different habitat types, the mitigation ratios vary. Credits for endangered species, scrub-shrub habitat, and riparian forest are measured in acres, and the shaded riverine aquatic habitat is measured in lineal feet. The number of credits per acre or lineal foot of impacted habitat depends on the quality of the respective habitats and may change as the bank's habitat matures. The agency or agencies having jurisdiction over the habitat or species impacted will determine the mitigation ratios. Neither the agency's approach nor the policy regarding the amount of credits to issue follows a standard pattern. Several regulators commented that the agencies also tend to engage in "dueling mandates," particularly between the Clean Water Act and the ESA regarding which statute has more weight in the considerations. Both the determination of the credit ratio and the dueling mandates make creating a bank a very long process. Although it took two years to complete the banking instrument, in the case of Kimball Island, this was considered quite a rapid approval process.

Wildlands owns and manages the bank, and the endowment funds will be held by the California Department of Fish and Game. These funds are calculated at $3.00 per linear foot of shaded riverine aquatic habitat and $1,000 per credit acre for any other aquatic or riparian habitat. A conservation easement on the property is held jointly by the U.S. Fish and Wildlife Service and the Corps. Wildlands is wholly responsible for managing and monitoring the bank. Its preliminary monitoring plan calls for the water-quality sampling to include turbidity and salinity levels monthly and tidal fluctuation seasonally and to provide certain baseline data for fish. This monitoring strategy is far more comprehensive then those developed for most other conservation banks.

Wildlands, Inc., was the first private enterprise to be fully authorized to develop a private commercial mitigation bank and sell credits to compensate for wetland losses in California. It currently owns several mitigation banks and works in partnership with groups like the American Land Conservancy and the Trust for Public Land to assist in the development of their banks, and it has full-time staff for the needed restoration design, regulatory permitting, credit marketing, and biological monitoring and maintenance.

Wildlands expects to sell the acreage-based credits for between $25,000 and $75,000 and the shaded riverine aquatic habitat credits for roughly $200 per linear foot. Though still in the midst of restoring Kimball Island, Wildlands has been allowed to sell a small number of credits. As of June 1999, the California Department of Water Resources had bought credits for riparian scrub, shaded mud flat, and shallow water habitat; Contra Costa County had bought credits for impacts to endangered species habitat; and the U.S. Army Corps of Engineers had bought credits for riparian and shaded riparian aquatic habitat.

The Saipan Upland Mitigation Bank

The Saipan Upland Mitigation Bank is a proposed endangered species mitigation bank on the island of Saipan, one of fifteen islands comprising the Commonwealth of the Northern Mariana Islands, a U.S. Commonwealth Territory. The commonwealth's legislature authorized the bank on January 9, 1998, to be established on a 814-acre "core area" of the commonwealth-owned Marpi Commonwealth Forest. The Marpi Commonwealth Forest is situated in the northern part of Saipan and is managed and controlled by the commonwealth's Department of Lands and Natural Resources. Established in 1983 for resource protection, the forest has the island's most extensive (but rare) native limestone forests, which harbor several endemic birds, including the endangered Micronesian megapode (*Megapodius laperouse*), the Mariana fruit dove (*Ptilinopus roseicapilla*), and the collared kingfisher (*Halcyon chloris*), as well as fruit bats and other endemic species. Also found in the forest are large areas of tangantangan/grassland mosaic, where endangered nightingale reed-warblers can be found.

This bank presents an interesting case study because it was developed in concert with an HCP and incidental take permit application for the Obyan Beach Resort. The resort is

proposed for the southeastern part of the island known as the Naftan Peninsula and is to be built on land leased to it by the commonwealth government. The peninsula currently is rural, and the proposed resort site has been used for cattle grazing, wildlife management, diving, and fishing. With or without this particular development, the pressure to provide jobs, housing, and other economic benefits to its citizens will likely drive the commonwealth to lease the site. Tourism is Saipan's leading source of employment, involving about half its workforce.

Negotiations to establish the bank were largely completed by June 1998, when an HCP and an incidental take permit application for the Obyan Beach Resort were submitted to the U.S. Fish and Wildlife Service. Subsequently, negotiations regarding certain aspects of the proposed bank were reopened, and the Service has not yet approved either the permit application or the banking agreement.

The Commonwealth of the Northern Mariana Islands has a land-tenure system that limits private ownership of land to people of Northern Mariana Islands descent. Nonindigenous interests may, however, lease land from indigenous landowners or from the government, which itself has significant landholdings. Through its leasing of land, the government tries to encourage certain forms of economic development, including resort-based tourism. In 1991, the government proposed leasing an area at the southern tip of Saipan and invited competitive bids. The successful bidder was Obyan Beach Resort Associates, which wanted to build a resort complex with two golf courses, three hotels, and assorted other developments on an 814-acre project site.

In May 1996, after securing a variety of approvals from the commonwealth government, Obyan Beach Resort Associates was informed by the Service that it would also need a permit under Section 10 of the ESA because of the anticipated incidental taking of nightingale reed-warblers. During the next two years, consultations among the various interests produced an agreement that the best way to meet the ESA's requirements for this and future developments would be by creating a mitigation bank. Because people not of Northern Mariana Islands descent cannot purchase land, a mitigation bank operated by the commonwealth would provide a practical means for noncommonwealth interests to secure off-site mitigation.

Just as the land-tenure system in the commonwealth is somewhat unusual, so too are the circumstances of the nightingale reed-warbler. Although endangered, this bird can be found on much of the island and is most abundant in habitats dominated by an introduced Philippine plant, tangantangan (*Leucaena lucocepha)*. Following the island's devastation during World War II, the United States tried to stem the erosion of island soils by aerial seeding of the fast-growing tangantangan. Today, tangantangan covers about 80 percent of the forty-six-square-mile island and, at lower elevations, is commonly inhabited by nightingale reed-warblers. Even though this bird has disappeared from some portions of its range, on Saipan it may actually be more abundant than it was before World War II.

Because tangantangan is highly invasive and grows rapidly, it is relatively easy to establish in areas currently subject to cultivation or grazing. Simply by discontinuing these activities, tangantangan can quickly be established at a site and, once established, nightingale reed-warblers can be expected to occupy it. That fact underlies the Saipan bank's mitigation strategy.

Although the bank is not yet operating, the manner in which it is intended to operate is described in considerable detail in the draft banking agreement, the HCP for the Obyan resort development, and the draft environmental assessment for the resort development. Although the bank is to be the primary means of mitigating the impacts of the resort, the HCP includes a number of measures to minimize on-site impacts as well. It requires that 55 percent of the overall site remain undeveloped, including all but two acres of native limestone forest and thirty-nine of forty-two acres of ironwood forest. Habitat capable of supporting ten pairs of reed-warblers is to be maintained at the site.

For each pair of reed-warblers incidentally taken during the resort's development, the developer must buy one credit from the bank. A credit is generated at the bank as a result of the government's commitment to carry out two actions: (1) preservation of sufficient habitat to support an existing pair of reed-warblers at the mitigation site and (2) enhancement of sufficient habitat to support a new pair of red-warblers. To achieve the enhancement objective, the government must protect degraded pasture or other lands from grazing or other activities, thereby allowing tangantangan to invade the site.

Preliminary estimates are that the core area may be capable of supporting thirty-five pairs of reed-warblers besides those already present. Thus, thirty-five credits could be available from the bank, of which the Obyan resort development has reserved the right to purchase twenty-four. The remaining credits are expected to be needed for various other projects anticipated in the future. Because the resort will be built in phases, credits may also be purchased in phases before each building phase begins.

According to the June 1998 version of the banking agreement, proceeds from the sale of credits are to be deposited as follows: 70 percent into a "management account" to be used for carrying out those actions required by a management plan; 20 percent into a "contingency account" to be used for taking remedial measures in the event that the bank's performance standards are not met; and 10 percent into a "long-term maintenance account," the income from which is to be used to pay the costs of management once all the credits have been sold and the bank has closed. Subsequent negotiations have attempted to create a more stable financing mechanism, by providing that a substantial portion of the proceeds from the sale of credits will be paid into an account, the income from which will be used to manage the bank.

When the bank is established, all of the projected thirty-five credits will be available immediately for sale. Sale of a credit obligates the bank to protect immediately the habitat for an existing pair of reed-warblers and to begin enhancement activities for a new pair. Success in establishing a new pair at the enhanced site need not be demonstrated

before a credit is sold. Upon the sale of any credits, specific areas in the Marpi forest associated with these credits must be demarcated. If the Service or the Department of Lands and Natural Resources determines before all the available credits are sold that the already debited credits are not meeting performance criteria, no more credits may be sold unless the remediation efforts are successful. The agreement also spells out the management requirements for the entire bank, regardless of whether credits have been sold. These measures include fencing areas where access by livestock may be a problem, developing and implementing a fire management plan and drawing up and putting into place regulations governing the public's use of the bank.

The agreement establishing the bank provides that the commonwealth shall determine the price of the credits sold. However, the agreement specifies that the price must be adequate to cover implementation of the agreement. These costs apparently do not include the underlying land costs, a fact that arguably understates the true cost of the credits. The agreement further specifies that a mitigation bank review team (composed of the Service and the commonwealth) must agree on the price. Thus, this bank is somewhat unusual in that it gives the Service substantial influence over the price of the credits. Though unusual, this arrangement may reflect the fact that the commonwealth has the dual role of mitigation banker and lessor of land for the development project. The inherent tension in these dual roles may make it appropriate for the Service to ensure that the price charged for mitigation credits is sufficient to achieve the mitigation goals.

The HCP for the Obyan beach resort development set a price per credit of $113,725, which was determined by amortizing the expected cost of management, including an endowment for future operations, and dividing that total cost by 35, the number of credits expected to be available at the site. Since then, further work on the management plan may revise the price per credit.

Because several other endangered species live on Saipan, the bank contemplates that credits for other species may be sold as well. The agreement, however, stipulates that the parties mutually agree on an assessment methodology for defining and quantifying credits with respect to other species. None of the documents pertaining to the bank discusses how the sale of credits for other species may affect the price of credits for the reed-warbler.

The Saipan Upland Mitigation Bank has not yet begun operating. More than a year has passed since the commonwealth and the Service reached a tentative agreement on how it is to work and since the incidental take permit application for the Obyan resort development was submitted. However, no final action has been taken. In part, the delay has resulted from the accidental death of a Service employee who had been deeply involved in the bank's development. Meanwhile, the Asian financial crisis has had a dramatic negative impact on Japanese tourism in Saipan, thus dampening prospects for the Obyan resort. As a result, there has been little pressure to complete action on the permit application, and the delay has allowed the parties to continue refining the particulars of the banking agreement.

The Champion International Red-Cockaded Woodpecker Mitigation Bank

Champion International Corporation is a large forest products company with land in several states and foreign countries. Among its lands is a parcel of approximately two thousand acres in east Texas within a larger unit called "Brushy Creek Forest." In 1994, Champion entered into a five-year memorandum of agreement with the U.S. Fish and Wildlife Service, Texas Parks and Wildlife, and the U.S. Forest Service in which it committed to manage the two-thousand-acre parcel so as to create conditions favorable for the red-cockaded woodpecker, an endangered species that had once occupied a portion of the parcel.

Champion's 1994 decision was not motivated by a desire to establish the Brushy Creek site as an endangered species mitigation site. Nor was Champion then able to protect its interests in the site by entering into a "safe harbor" agreement that would have allowed it to remove any habitat improvements, even though the woodpeckers might then be occupying the improved areas. At the time, the nation's first safe harbor agreement was still more than six months away from completion, and although Champion later learned about safe harbor agreements, it did not elect to pursue one until 1998. Rather, in 1994, Champion was apparently motivated simply by its desire to be a good corporate citizen and to help establish working models to conserve an endangered species, even though its actions might further encumber the Brushy Creek site with restrictions under the ESA.

Champion's effort in east Texas was one of several in which it saw its role as promoting positive approaches to ESA issues. The company was a founding member of the Black Bear Conservation Committee in Louisiana (focusing on the Louisiana black bear, *Ursus americanus luteolus*), a participant in a similar effort in Maine to aid the conservation of the Atlantic salmon (*Salmo salar*), and a participant in an industry-supported study of three declining amphibians of the South (flatwood salamander, *Ambystoma cingulatum*; stripped newt, *Notophthalmus perstriatus*; and gopher frog, *Rana capito*). The company was also the first forest products company to work with the newly created National Biological Survey to test survey techniques for aquatic and terrestrial species on private forests. By actively promoting the conservation of the red-cockaded woodpecker at the Brushy Creek site, the company hoped to provide a win-win solution--more flexibility in its management activities elsewhere and a better chance of the woodpeckers' survival.

In 1997, a new circumstance prompted Champion to reconsider its arrangements for Brushy Creek. A timber purchase agreement between Champion and Misstex Properties, owner of a 753-acre tract in Montgomery County, Texas, revealed the presence on the Misstex property of two red-cockaded woodpecker cluster sites, one still occupied and one abandoned. Misstex was required by the Fish and Wildlife Service's red-cockaded woodpecker guidelines to leave eighty acres uncut so as to provide foraging habitat for the birds in the occupied site. Misstex, however, wanted to be relieved of that requirement and sought permission to cut all of its tract by applying for an incidental take permit under Section 10(a)(1)(B) of the ESA.

To support its application for a permit to harvest the last eighty acres, Misstex submitted an HCP. The HCP proposed mitigating the impact of the tree cutting by paying $50,000 to Champion, to be used to try to establish a new group of red-cockaded woodpeckers on the Brushy Creek site. Champion also pledged to assist in managing the habitat for the remaining birds on the Misstex site before the trees were cut and to move their progeny to its own Brushy Creek site. In addition, Champion agreed to enroll its Brushy Creek site (in order to establish a baseline) in the east Texas regional safe harbor program for red-cockaded woodpeckers that the Fish and Wildlife Service approved in early 1998 and to do this before Champion's 1994 memorandum of agreement expired on August 21, 1999.

The object of the translocation efforts required by the HCP was to establish on the Brushy Creek site one new breeding group of red-cockaded woodpeckers to replace the group that would be lost at the Misstex site. If no new breeding group was established at Brushy Creek in four years, Misstex could still undertake its planned harvest. To reflect its assumption of Misstex's responsibility for mitigating the loss of birds on the Misstex site, Champion agreed to increase its safe harbor "baseline" at Brushy Creek by one group and to protect 210 acres of suitable habitat for this addition to its baseline. Champion's commitment to the long-term management of the site is covered under a cooperative agreement with the Service.

This arrangement has many elements of entrepreneurial mitigation banking. One private landowner (Misstex) pays another (Champion) to assume the former's legal responsibility for mitigating adverse resource impacts on the former's property. Unlike the prototypical entrepreneurial mitigation banking situation, however, Champion's motivation in this arrangement was not profit. Indeed, Champion agreed to donate the balance of the $50,000 payment (about $35,000) it received from Misstex--after deducting the costs of surveys, monitoring, translocation, and similar activities--to the National Fish and Wildlife Foundation. In this respect, Champion's position is more like that of a public agency or nonprofit organization acting as a mitigation banker; the sum it retains is intended merely to cover its costs, not to generate a profit and with no costs allocated to land encumbered.

As a for-profit company, Champion did recognize one business advantage in acting as a mitigation banker beyond the $50,000 payment--goodwill. Like many timber companies, Champion cannot supply all the wood needed for its mills from its own lands but must often buy wood from other landowners. Because other landowners are free to sell their timber to whomever they wish, Champion and its competitors seek to cultivate good relationships with landowners from whom they hope to buy timber. Champion worked very closely with Misstex in developing the HCP that allows Misstex to cut its last eighty acres of timber, and Champion itself will carry out the monitoring, banding, translocating, and other activities required by the HCP. Its ability to help another landowner solve an endangered species problem not only creates a positive relationship with that landowner but also furnishes an example that is likely to cast Champion in a favorable light in the eyes of other landowners.

The arrangement between Misstex and Champion was an innovative, progressive advance in mitigating the loss of red-cockaded woodpeckers on private land. In almost all the earlier HCPs for this species, the mitigation took the form of a payment by the mitigating landowner to a federal land managing agency to cover the cost of managing federal lands. In effect, earlier HCPs shifted to private parties the burden of paying for management activities that federal land-managing agencies should be undertaking. As a practical matter, it has been nearly impossible to separate the activities paid for by the mitigating landowner from those paid for by the federal agency, thus making the ultimate success or failure of mitigation efforts impossible to determine. Moreover, the earlier HCPs did not formally transfer the legal responsibility for the mitigation.

Despite the creative and positive Misstex-Champion arrangement, Champion had many problems securing approval for it and is not inclined to pursue a similar agreement in the future. Champion's concerns are many. First, it believed that the process took far too much time. From its perspective, the government failed to appreciate that for a private business, time is money, and failing to move forward expeditiously with any idea seriously imperils it. A long delay can mean more than additional expense; in this case, it may also have been responsible for further biological loss. Champion asserts that delays in securing necessary approvals meant that it lost the opportunity to move at least one juvenile bird from the Misstex property to the Brushy Creek property. By the time the approvals were issued, the young bird had left its natal territory and could no longer be captured.

A separate but related concern was that, again from Champion's perspective, the standards and requirements for approval were a moving target. Each time Champion had satisfied what it thought were the government's requirements, a new one would surface, necessitating another round of negotiations. Resolving the issue of the permanent protection of a precisely delineated 210 acres for the new baseline group was a particularly difficult issue, as was the question of what to do in the event that mitigation efforts were not successful in creating a new breeding group.

In Champion's view, the biggest problem stemmed from the fact that a private landowner was willing to pay $50,000 for mitigation. The problem itself was that everyone wanted some of that money. Some wanted it to go to the Fish and Wildlife Service to spend on refuge properties. Others wanted it to go to the nearby National Forest. Still others wanted it for state-owned lands. The idea that it should go to a private landowner for mitigation on that landowner's land was not enthusiastically embraced.

In Champion's view, the Service's policies, at least as articulated at the national level, were not the problem. Rather, it believed the difficulties were primarily their interpretation and implementation. Despite its growing frustration, Champion never took its problem to the top levels of the Service, where it might have been able to elicit sympathy and help. Often, large landowners with extensive and continuing interactions

with field-level federal agency personnel are reluctant to elevate difficulties within the agency because doing so might hurt future dealings with field-level personnel.

Even though these problems may have arisen under any circumstances, they probably were exacerbated by the lack of a written policy concerning the use of mitigation banking for endangered species. Champion's experience was similar to that of wetland mitigation banking entrepreneurs before 1995, when written federal interagency guidance was first promulgated to lead the future development of wetland mitigation banks. Those early entrepreneurs commonly encountered frustrating delays, unclear and shifting standards, and competing agencies. The absence of clear written direction added to the cost and complexity of developing mitigation banks and deterred many from undertaking or repeating the effort.

While openly sharing its concerns about the process for this project, Champion was explicit about its commitment to trying to innovate and seek conservation solutions. Company personnel believe that most obstacles come from (1) a lack of understanding of the private sector's motivations; (2) unclear policies; (3) a lack of understanding how private landowners can contribute to conservation; and (4) the fear of being challenged from inside or outside the agency regarding any decision that is made.

The Southlands Mitigation Bank

The Southlands Mitigation Bank grew out of a unique effort to develop an HCP for industrial forestland owned by the International Paper Company (IP). Under the plan, IP is to manage a 5,300-acre portion of its 16,000-acre "Southlands Experimental Forest" near Bainbridge, Georgia, for the purpose of increasing the number of red-cockaded woodpecker groups there. If successful in doing so, IP can treat the increase as mitigation for the incidental take of this species elsewhere on IP's industrial forestland. It may also, with the U.S. Fish and Wildlife Service's approval, sell credits to third parties, thus functioning as a private, entrepreneurial mitigation bank. To date, the HCP has been approved, and IP has had substantial initial success in building up the population of red-cockaded woodpeckers at the Southlands site. It has not yet either used or sold mitigation credits, however.

IP is a major forest products company with extensive forest landholdings in eight southeastern states. Much of its land is intensively managed, short-rotation pine plantations, as is typical of industrial forestland throughout the Southeast. With rare exceptions, such land is inhospitable to the red-cockaded woodpecker, which generally requires stands thirty years of age or older for foraging habitat and trees of one hundred years or older for nesting. Thus, despite IP's extensive forest landholdings, very little is suitable habitat for the red-cockaded woodpecker. When IP began working on its HCP, it was aware of only eighteen groups of red-cockaded woodpeckers on all its land, sixteen on its operational lands and two on its Southlands Experimental Forest in Georgia. As its name implies, Southlands is used by the company for experimental purposes, testing a

variety of silvicultural practices and techniques for possible application on IP's operational lands.

By the mid-1990s, several southeastern forest landowners had begun to develop either HCPs or "no-take agreements" for the red-cockaded woodpecker ("no-take" agreements are agreements between a landowner and the Fish and Wildlife Service that if the landowner adheres to certain management prescriptions, the Service agrees that no "take" woodpeckers will occur). IP wanted to be able to take the remaining scattered groups of woodpeckers on its operational lands, but it also wanted to do something innovative and different. The safe harbor program that had been recently inaugurated in the Sandhills of North Carolina had come to the company's attention and prompted it to do something similarly innovative. Because the company was aware that the Environmental Defense Fund (EDF) had played a key role in crafting the Sandhills safe harbor program, it invited EDF to meet with it to explore ideas for IP's land. An initial exploratory meeting and site visit was followed by a series of communications and drafts that eventually became IP's HCP.

The red-cockaded woodpecker is one of the few endangered species for which the U.S. Fish and Wildlife Service has developed written, quantitative guidelines that attempt to translate into readily understandable requirements the ESA's often nebulous prohibition against "taking" a protected species. Because individual family groups of this nonmigratory species typically occupy the same sites for years at a time, the Service's guidelines are based on the presence of an occupied site. In effect, the Service's guidelines draw a circle with a half-mile radius around each occupied site. Within that circle, the landowner (or landowners, if the circle encompasses more than one property) must maintain a minimal amount of suitable foraging habitat (the acreage may vary depending on the number and size of the trees involved). If a landowner reduces the amount of foraging habitat within the circle below the minimum specified in the guidelines and the birds abandon the site, the Service may hold the landowner responsible for their taking.

In this scheme, everything hinges on the presence of an occupied (or "active") site on or near a landowner's property. If such a site is present, a landowner is responsible for the birds occupying it. If no such site is present, a landowner is not restrained by the guidelines. If the occupied site ceases to be occupied (e.g., a storm topples the cavity trees), the restraints are no longer applicable to it.

The core of the HCP devised by IP is its commitment to manage a portion of the Southlands Experimental Forest so as to create new occupied sites. The objective is to build up the population of red-cockaded woodpeckers there from two groups to thirty or more. The strategy to do this includes controlling the hardwood understory through prescribed fire or other means, drilling artificial cavities, rehabilitating formerly suitable cavities, and translocating juvenile birds from other locations.

The plan includes clear criteria for judging the success of these efforts. When IP succeeds in "activating" a site by attracting and holding a pair of red-cockaded woodpeckers, it is entitled either to take, incidental to its timber harvest operations, a group of woodpeckers elsewhere on its own property or to sell or transfer a mitigation credit to a third party. Although IP may use credits from Southlands to mitigate the loss of birds anywhere on its own property, it may sell credits to third parties only to mitigate impacts within a service area that includes the panhandle of Florida, the coastal plain of Alabama, and the coastal plain of Georgia. Once IP uses a credit or sells it to a third party, IP must actively manage the occupied site so as to keep it occupied for the agreement's thirty-year duration. If an occupied site becomes unoccupied after a credit applicable to it has been used or sold, IP must use its best efforts to reactivate the site. The use of credits to mitigate the incidental taking of woodpeckers on IP's own land does not require the Service's concurrence, but the sale of credits to third parties does. The reason for requiring the Service's concurrence is to ensure that the groups to be incidentally taken on the lands of others do not have special conservation significance, by virtue of their location or otherwise, that would not be fully mitigated by the use of credits from the Southlands Bank.

Considerable fanfare accompanied the Fish and Wildlife Service's approval of the plan. At a public ceremony in Bainbridge, Service Director Jamie Clark hailed the plan for creating "an economic incentive . . . for International Paper. They have a plan where they hope to one day market woodpecker credits. We think that's great." Although the plan was formally approved in February 1999, IP did not wait for formal approval to begin building its population of red-cockaded woodpeckers at Southlands. As a result, by the latter half of 1999, the number of woodpeckers at Southlands had increased from three in 1996 (when IP began work on the plan) to fourteen. The increase includes some birds that were translocated and some that came spontaneously to the actively managed sites from elsewhere. IP has not yet used or sold any credits from the bank, although it reportedly has discussed sales with one or more third parties.

In the summer of 1999, the Georgia Department of Natural Resources (DNR) submitted to the Fish and Wildlife Service an application for a statewide red-cockaded woodpecker HCP. According to the application, Georgia landowners could incidentally take groups of woodpeckers on their land that are considered to be "demographically isolated" from other groups, provided that they satisfy certain mitigation requirements. Under this proposed plan, a landowner could mitigate by purchasing credits from IP or in a number of other ways. If approved, the Georgia DNR plan could affect the market for credits from IP, although to date, this issue has received little attention.

APPENDIX II: DRAFT POLICY ON THE ESTABLISHMENT, USE, AND OPERATION OF MITIGATION BANKS UNDER THE ENDANGERED SPECIES ACT

Introduction and Purpose

This draft policy provides guidance for the establishment, use, and operation of mitigation banks for the purpose of mitigating adverse impacts to threatened or endangered species under the Endangered Species Act (ESA). Although Section 9 of the ESA generally prohibits the "taking" of endangered or threatened species, Section 10 authorizes the issuance of permits allowing such species to be taken incidental to the carrying out of otherwise lawful activities. To issue such a permit, the Service (either the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, depending on the species affected) must find, among other things, that the permit applicant has prepared a conservation plan that "will to the maximum extent practicable, minimize and mitigate the impacts of such taking." In implementing this provision, the Service has, on several occasions, allowed the requirement to mitigate the impacts of authorized taking to be met by the purchase of credits from various "mitigation banks." In addition, Section 7 of the ESA requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of listed species or adversely modify or destroy their critical habitat. To meet this requirement, federal agencies (or those whom such agencies authorize or fund) often include a mitigation component in their proposed activities, and the Service has sometimes encouraged them to establish mitigation banks as a means of anticipating and minimizing the impacts of their future activities.

The interest in, and use of, mitigation banks to meet the ESA's requirements are growing. At present, however, the Service has neither a formal policy nor any official guidance pertaining to the establishment, use, or operation of mitigation banks for endangered species conservation purposes. Without policy or guidance, decisions about mitigation banks have been ad hoc and uncoordinated. To provide better coordination within the Service and more consistent and useful information to parties outside the Service, the Service proposes to adopt the Policy on the Establishment, Use, and Operation of Mitigation Banks Under the Endangered Species Act.

In preparing this draft policy, the Service carefully considered the 1995 interagency Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks under the Clean Water Act and the Food Security Act. The 1995 Guidance addresses the mitigation requirements of those laws with respect to wetlands and other aquatic resources. The Service also considered the Policy on the National Wildlife Refuge System and Compensatory Mitigation Under the Section 10/404 Program, published on September 10, 1999. This latter draft policy also pertains only to mitigation requirements relating to wetlands and other aquatic resources. Although the interagency guidance and refuge policy consider many issues common to any form of mitigation banking, their

conclusions are not necessarily transferable to endangered species mitigation. There are important differences between wetlands and endangered species and the goals and requirements of the laws pertaining to each, differences that often dictate different policies governing mitigation banking for wetlands and endangered species.

Part 1. Scope of the Policy

This draft policy applies to the use of mitigation banks by nonfederal parties to meet the requirements to minimize, mitigate, or compensate for adverse impacts to listed species of authorized activities under the ESA. Such activities include those authorized by permits under Section 10(a)(1)(B) and those reviewed under Section 7.

Part 2. Mitigation Banks As Distinguished from Other Forms of Mitigation

Mitigation under the ESA has many forms. In some cases, to compensate for adverse impacts to listed species, land (or water) is deeded to a public or nonprofit agency for conservation purposes. In other cases, land remains with its current owner, but its use is restricted in some manner to benefit listed species. In still other cases, mitigation takes the form of monetary payments to a public or nonprofit agency, with the payments used to acquire land for conservation purposes, to manage already acquired land, or to perform some other specific task. Mitigation also can be through the purchase of defined "credits" from an approved "mitigation bank."

Several features distinguish mitigation banks from other forms of endangered species mitigation. Typically, in a mitigation bank, the mitigation is carried out before the action that causes the impact to be mitigated. Mitigation banks are therefore anticipatory, established in anticipation of some future demand for mitigation to compensate for the effects of future actions. Mitigation banks are also typically designed to provide a means of mitigating, at a single, larger site, the impacts of future activities at many smaller sites. Thus, mitigation banks are aggregative; they consolidate at a single site the mitigation for activities that may be widely dispersed. Mitigation banks can be designed to meet the future mitigation needs of either those who establish them or third parties. When mitigation banks have been established to meet the future mitigation needs of third parties, the sale of the bank's credits to third parties is typically at a price dictated by the market and is negotiated between the bank and the third party. Once the Service has approved mitigation through the purchase of bank credits by a third party, the legal responsibility for the mitigation, including the responsibility to remedy any failings of the mitigation efforts, is assumed by the bank.

Some habitat conservation plans have features that superficially resemble mitigation banking but differ in other ways. For example, many habitat conservation plans allow individual landowners to meet their obligations by paying a local government a fixed, per-acre assessment on land they develop, with the proceeds used to finance a conservation program by the local government. These payments are sometimes called "*wildlife impact fees*." The rationale of these plans is that because the local government

has authority over land use within its jurisdiction, it shares the legal responsibility for any incidental taking of endangered species that results from permitted development. In mitigation banking, however, the banker typically has no control over or legal responsibility for the actions of others. Only by selling credits to others does it assume their responsibility for mitigation. In habitat conservation plans financed by special local assessments, mitigation is also typically carried out either concurrently with or after development. The core idea of a mitigation bank is that the mitigation is accomplished first and "banked" for use later. These differences are what set mitigation banks apart from many local or regional habitat conservation plans.

Mitigation banks should also be distinguished from arrangements in which the party carrying out an action that requires mitigation simply pays a set amount into an established fund operated by a natural resources agency or nonprofit conservation organization. These arrangements are commonly referred to as *in lieu payment* programs, because a payment is made in lieu of actually taking any specific mitigation measures. Payments into such funds are generally intended for future conservation actions by the party administering the fund, not for a specific, identifiable mitigation activity.

Part 3. Definitions

For purposes of this policy, the following terms have the following meanings:

a. *Bank sponsor.* A *bank sponsor* is any public or private entity responsible for establishing a mitigation bank.

b. *Creation. Creation* refers to the establishment of habitat for an endangered or threatened species where no such habitat previously existed.

c. *Credit.* A *credit* is a unit of measure representing the accrual of conservation benefits for an endangered or threatened species at a mitigation bank.

d. *Debit.* A *debit* is a unit of measure representing the loss of conservation benefits at an impact or project site.

e. *Mitigation bank.* A *mitigation bank* is a site where habitat for endangered or threatened species is preserved, created, or restored for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources elsewhere.

f. *Preservation. Preservation* refers to the protection, usually in perpetuity, of habitat for an endangered or threatened species through the implementation of appropriate legal and physical mechanisms.

g. *Restoration. Restoration* includes activities designed to restore habitat for an endangered or threatened species at a site where it formerly existed, as well as activities designed to improve the quality of degraded habitat for such species.

h. *Service. Service* refers to either the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, or both.

i. *Service area. Service area* refers to the designated geographic area or areas within which the credits associated with a particular mitigation bank can be used to compensate for authorized impacts on endangered or threatened species.

Part 4. Planning Considerations

Carefully designed and appropriately sited mitigation banks can contribute to the conservation of threatened or endangered species. Threatened or endangered species often face a wide array of threats, only some of which fall within the scope of the ESA's prohibition against taking such species. Conservation prospects can be improved by securing management commitments that effectively address those other threats (e.g., invasive exotic species, disruption of natural disturbance regimes, cowbird parasitism), increasing the likelihood that sites currently occupied by threatened or endangered species will remain occupied. Currently occupied sites may be too small or too distant from other occupied sites for listed species to be likely to survive in them over time. Mitigation banks that effectively enlarge such sites or buffer them from external threats thus can improve conservation prospects. Mitigation banks can also protect sites that are not currently occupied by listed or threatened species but that may be important to the future recovery of such species.

Two issues of paramount importance in planning any mitigation bank are the siting of the bank and its management program. Persons contemplating the establishment of a mitigation bank should confer in advance with the Service about both. Although recovery plans for individual species will rarely, if ever, identify particular parcels as desirable sites for mitigation banks or other conservation actions, they often identify broader areas within which recovery efforts will be focused. By siting mitigation banks in these areas, banks can create mitigation opportunities that both increase the options available to regulated interests and contribute to the conservation of the species. For species without recovery plans, or with plans that do not clearly identify those areas where recovery efforts will be primarily focused, conferral with the Service is especially important, to identify those areas it regards as of particular value in conserving the species.

For many species, individual mitigation banks are seldom large enough, by themselves, to support a viable population of a threatened or endangered species over the long term. But if the bank is located next to an existing area managed for the conservation of that

species, even a small mitigation bank may increase the likelihood that a viable population can be maintained there. Similarly, if banks are sited to encourage dispersal between two areas managed for the conservation of the species, the bank may increase the likelihood of the species surviving at both locations. In some instances, banks may be able to provide replacement habitat for species currently occupying nearby unmanaged habitats at risk of becoming unsuitable because of succession. Sites that otherwise appear to be good locations for mitigation banks may turn out, on closer examination, to be inappropriate because of anticipated land-use changes in the surrounding area. These and other considerations relevant to the siting of a mitigation bank should be taken into account at the outset and discussed with the Service to ensure that the would-be banker's objectives and the Service's objectives for the species are compatible.

No less important than siting is the bank's management program. This, too, should be the focus of early discussion with the Service. Seldom will the needs of a threatened or endangered species be met on a completely unmanaged piece of property. More commonly, an active management program--to control invasive exotic species, replicate natural disturbance regimes; prevent an area's use by off-road vehicles, illegal garbage dumpers or others; and address myriad other threats--is essential to ensure that the potential conservation value of a particular property is realized and maintained. These management needs should be anticipated and provided for in any mitigation banking agreement.

As with siting considerations, recovery plans provide a logical starting place for identifying needed management measures for a proposed mitigation bank. Because actual management needs at any site depend on its particular circumstances, early conferral with the Service to identify appropriate management measures at that site is advisable.

Part 5. Development of a Mitigation Banking Agreement

A mitigation banking agreement between the bank sponsor and the Service documents the agency's agreement with the objectives, proposed administration, and management of the bank. The agreement should describe in detail the physical and legal characteristics of the bank and how the bank will be established and operated. In general, the following information should be included:

a. The bank's goals and objectives, including identification of the species for which the bank is to be primarily operated.

b. An accurate legal description and map of the bank property and identification of the bank's owners and managers.

c. A detailed description of existing conditions at the bank site, including the nature and extent of its use by the species for which it is to be primarily operated.

d. A description of the specific management measures to be carried out at the site for the conservation of the species for which it is to be primarily operated.

e. The methods for determining credits within the bank and debits outside the bank, setting performance standards to calculate the availability of credits, and devising accounting procedures to track the creation and use of such credits.

f. The geographic service area within which credits from the bank can be used to mitigate the impacts of other activities.

g. Provisions for long-term management and maintenance.

h. Monitoring, inspection, and reporting requirements.

i. Contingency and remedial action responsibilities in the event that the sponsor does not fulfill the obligations of the agreement or the bank is transferred to another entity.

j. Financial assurances.

k. Provisions for amending the banking agreement.

Part 6. Coordination with Other Levels of Government

Mitigation banks covered by this policy are those established to meet the requirements of the ESA. State or local laws may also impose requirements that can be met by the measures provided for in a mitigation bank. When that is the case, the Service requires that the relevant state or local government entity be given an opportunity to participate in the development of a mitigation banking agreement and to become a party to it. The Service will endeavor to coordinate its requirements with those of state or local government entities to the extent possible in order to minimize expenses, burdens, or duplicative requirements for bank sponsors, project proponents, and other governmental agencies. Although the Service will encourage the appropriate state and local governmental agencies to participate in the development of mitigation banking agreements and to become parties to them, the failure of such other agencies to participate in developing, or to sign an agreement that otherwise meets the requirements of this policy and of the ESA, shall not preclude the Service from entering into such an agreement.

Part 7. Public Review and Comment

Section 10 of the ESA requires that for applications for permits authorizing the taking of listed species, notice must be published in the Federal Register and an opportunity for public comment provided. Establishing a mitigation bank will not ordinarily necessitate

an application for a permit. However, the use of credits from an established bank to mitigate subsequently approved actions will require a permit application, notice, and opportunity for public comment, if done pursuant to Section 10. If there are significant public concerns about the design or operation of a mitigation bank, it is better to discover them before approving a banking agreement than afterward. Therefore, before entering into a mitigation banking agreement under this policy, the Service will publish in the Federal Register advance notice of its intent to do so and invite public comment on the proposed agreement in the same manner as it does with respect to applications for permits under Section 10. In some instances, a mitigation banking agreement may be considered at the same time as a related permit application. When that is the case, the notice and comment requirements for each may be combined.

Part 8. Service Areas

Every mitigation banking agreement must specify the geographic area within which credits earned by the bank can be used to mitigate the effects on listed species of actions authorized by the ESA. Service areas should be determined with a view to using mitigation banks to advance the conservation of the affected species. Thus, banks generally should be located within areas designated in recovery plans as focal areas for recovery efforts, and their service areas should correspond to the recovery areas in which they are located. If there is no applicable recovery plan, banks should be sited, and service areas should be designated, to serve a comparable purpose.

Two exceptions to the preceding general guidance should be noted. First, some projects may be located outside a designated focal area for recovery. Banks located within areas designated as focal areas for recovery efforts should be able to provide credits for such projects. In such situations, the project to be mitigated will have little or no detrimental impact on recovery prospects, and the mitigation bank will aid those prospects.

A second exception to the general guidance regarding service areas concerns projects located in focal areas for recovery efforts and undertaken *after* the recovery objectives for those areas have been achieved. Such projects should be able to buy mitigation credits from banks located in other recovery focal areas. Allowing such projects to do so will help achieve the recovery objectives in the focal area where the bank is located, without hurting these objectives in the area of the project requiring mitigation.

Part 9. Credits, Debits, and Accounting Procedures

Credits and *debits* are the terms used to designate the units of trade (i.e., the currency) in mitigation banking. Every mitigation banking agreement should specify the methods for determining credits within the bank and debits outside the bank, setting performance standards to calculate credit availability, and devising accounting procedures to track the creation and use of such credits. If several mitigation banks are created for the same species, the Service will use a consistent methodology for determining credits in each of them and make that methodology publicly available. That methodology should also be

consistent with the methodology used to determine mitigation requirements for activities mitigated by means other than the purchase of credits from mitigation banks.

Credits associated with a mitigation activity (as well as debits associated with an activity requiring mitigation) should reflect an assessment of the degree of beneficial (or detrimental) impact of the activity on the prospects for the affected species' survival. In theory, population viability analyses could be used to quantify the degree of impact on survival prospects. In practice, however, the information needed for rigorous population viability analyses is often unavailable. As a result, the units of currency may take the form of surrogates for the extent of impact on population viability, such as occupied acres or nesting pairs beneficially or detrimentally affected. In determining credits or debits, the same types of activities may be weighted differently depending on where they occur (e.g., nearby or far from existing protected areas), or other factors (e.g., quality of habitat at the affected site). The rationale for any differential weighting schemes should be clearly articulated in the mitigation agreement or elsewhere.

In some instances, banks may be designed to conserve habitat types that are typically used by several listed species. In such cases, it usually is necessary to determine that the species of concern generally associated with the habitat type do in fact use the mitigation bank site. If some of the species typically associated with a particular habitat type do not actually use the mitigation bank site, it may be inappropriate to mitigate the impacts of activities affecting that habitat type elsewhere by using credits from the mitigation bank.

In general, three types of activities of mitigation banks can generate credits: (1) habitat preservation (the preservation of specified, existing habitat through a conservation easement, transfer of fee title ownership to a conservation entity, or other appropriate means); (2) habitat restoration (the restoration of habitat for an endangered or threatened species at a site where it formerly existed or the restoration of a degraded habitat to an improved condition); and (3) habitat creation (the creation of a specified habitat where it did not previously exist). When deciding whether the preservation of existing habitat is appropriate as the sole basis for generating credits at a mitigation bank, consideration should be given to whether that habitat is under a demonstrable threat of loss or substantial degradation due to activities not otherwise likely to be effectively controlled (such as invasion by exotic species or ecological succession due to the absence of natural disturbance regimes). Typically, mitigation banks involving either habitat creation or restoration activities also require preservation of the restored or created habitat. Some mitigation banks encompass all three types of activities. The mitigation banking agreement should identify both the activities that will produce the credits and the methodology for quantifying them. In the case of habitat creation and restoration activities, the banking agreement should specify the performance standards that, when met, will result in credits being created at the bank site.

Credits "mature" and become available for use at different times, depending on the nature of the activity producing the credits. In general, credits for preserving existing habitat are available for use as soon as an easement, title transfer, or other satisfactory mechanism

ensuring dedication of the site to conservation and management in accordance with a particular plan is in place. Credits for creating or restoring habitat are available for use only after the creation or restoration activities have been successfully implemented and an easement, title transfer, or other satisfactory mechanism ensuring dedication of the restored or created habitat has been put in place.

The price of credits sold to a third party shall be agreed on by the bank sponsor and the third party; the Service will play no role in setting the price of credits. The mitigation banking agreement should require that the bank sponsor establish and maintain an accounting system (i.e., a ledger) to document all transactions involving bank credits. Each time a bank makes an approved credit/debit transaction, the bank sponsor should submit a statement to the Service. The bank sponsor should also submit to the Service an annual ledger report for all mitigation bank transactions.

Part 10. Provisions for Long-Term Management and Maintenance

In general, mitigation banking agreements should provide that the habitat resources in such banks will be conserved and appropriately managed in perpetuity through mechanisms such as conservation easements or transfer of title to a governmental resource agency or nonprofit conservation organization, accompanied by an adequate endowment for long-term management. When conservation easements are used to ensure permanent protection, they should effectively restrict harmful activities that could jeopardize the purpose of the bank, but they need not restrict activities or uses that are compatible with the bank's purposes. In appropriate circumstances, real estate arrangements may be approved that provide for less than permanent protection of the habitat resources in a bank (such as when the adverse effects of the project requiring mitigation are temporary or the habitat resources at the site of the project requiring mitigation are unlikely to remain there for long, with or without the project). An alternative and generally preferable way of dealing with these latter circumstances is to adjust the amount of credits required to compensate for the anticipated adverse effects (i.e., the mitigation ratio) in light of the expected duration of those effects.

Part 11. Use of a Mitigation Bank Versus On-Site Mitigation

This policy does not presume that the use of a mitigation bank is generally preferable to on-site mitigation, or vice versa. Rather, the purpose of the policy is to ensure that mitigation banks are sited and managed so as to contribute to the conservation of the affected species. Unless mitigation opportunities at the site of the proposed project are also likely to improve the conservation prospects of the species, a mitigation bank should be preferred to on-site mitigation.

Part 12. Use of Public Lands as a Mitigation Bank

Federal land management agencies, like all other federal agencies, have an affirmative responsibility, under Section 7(a)(1) of the ESA, to use their various authorities to

advance the ESA's purposes by carrying out programs for the conservation of listed species. This affirmative duty is independent of any separate duty of nonfederal persons to mitigate the adverse effects on listed species of activities that they carry out. Accordingly, mitigation of the adverse effects of nonfederal actions should, whenever possible, be carried out on nonfederal lands, and mitigation banks should not be sited on federal lands. Mitigation banks may be sited on other public lands (such as state or local government lands). Mitigation credits generated by banks of this nature should be based solely on those values in the bank that are supplemental to the public program already planned or in place. Existing values represented by ongoing or already planned public programs, including preservation value, should not be counted toward bank credits.

Similarly, federally funded conservation projects undertaken by a separate authority and for other purposes, such as the Wildlife Habitat Improvement Program or the Partners for Fish and Wildlife Program, cannot be used for generating credits in a mitigation bank, at least during the period that the landowner is required to maintain the projects. However, these other authorities typically allow a landowner to remove restored or created habitat at the end of a specified period. If a landowner agrees to preserve such areas beyond the term of the original agreement, mitigation credits may be issued for doing so. Similarly, a landowner's agreement to protect in perpetuity habitats originally created or restored pursuant to endangered species safe harbor agreements can serve as the basis for credits in a mitigation bank.

Part 13. Monitoring Requirements

The bank sponsor is responsible for monitoring mitigation banks based in whole or in part on habitat restoration or habitat creation activities, in accordance with the monitoring provisions in the mitigation banking agreement to determine the level of success and any problems requiring remedial attention. Monitoring provisions should be specifically described in the banking agreement and be based on scientifically sound performance standards prescribed for the bank. Monitoring should be conducted at time intervals suitable for the particular project type and until such time as the Service has decided that it has been successful. The bank sponsor should submit annual monitoring reports to the Service.

In addition to the monitoring activities required of the bank sponsor, the mitigation banking agreement must allow for the Service's right to enter bank lands in order to evaluate compliance with the banking agreement, the results of habitat creation or restoration activities, and the implementation of required management activities.

Part 14. Remedial Actions

The mitigation banking agreement should stipulate the general procedures for identifying and implementing remedial measures at a bank. These remedial measures should be based on both information in the monitoring reports and the Service's inspections. The Service, in consultation with the bank sponsor, will decide on the need for remediation.

Part 15. Financial Assurances

The bank sponsor is responsible for securing sufficient funds or other financial assurances to cover contingency actions in the event of the bank's default or failure. In addition, the bank sponsor is responsible for securing adequate funding to monitor and maintain the bank during its operational life and to endow its proper management thereafter. The total funding requirements should reflect realistic cost estimates for monitoring, long-term management, and contingency and remedial actions.

Financial assurances may be in the form of performance bonds, irrevocable trusts, escrow accounts, casualty insurance, letters of credit, or other approved instruments. Such assurances may be phased out or reduced once the bank has demonstrated that it has met its performance requirements as described in the banking agreement.

APPENDIX III: MODEL ENDANGERED SPECIES MITIGATION BANKING AGREEMENT

(for a single-species bank based on the preservation of existing habitat as well as habitat restoration and creation activities)

This endangered species mitigation banking agreement is made and entered into this ___ day of ____, 1999, among [NAME OF BANK OWNER] ("Property Owner"), the United States Fish and Wildlife Service [OR National Marine Fisheries Service] ("Service"), and [state fish and wildlife agency IF APPLICABLE]. The Property Owner and the Service [and the state fish and wildlife agency IF APPLICABLE] are referred to jointly as the "Parties." The purpose of this agreement is to establish the terms and conditions for a mitigation bank on certain real property to be known as the "[NAME] Mitigation Bank."

RECITALS

A. The Property Owner is the owner of [NUMBER] acres of real property located in [NAME] County, [STATE], and more completely described in Exhibit A (general location map and legal description) and illustrated in Exhibit B (legal parcel map) attached hereto ("Property").

B. Under the Endangered Species Act of 1973, 16 U.S.C. 1531 et seq., the Service has jurisdiction over activities affecting the conservation of species designated as endangered or threatened or their habitats.

C. [Comparable recital of fish and wildlife agency's authority if applicable].

D. Establishment of the [NAME] Mitigation Bank is intended to further the conservation of the [SPECIES' COMMON AND SCIENTIFIC NAMES], a species designated as [endangered OR threatened] under the Endangered Species Act while providing opportunities to mitigate the impacts of authorized activities affecting such species elsewhere. The primary goal of the [NAME] Mitigation Bank is to [protect existing, restore degraded, or create new] habitat on approximately [NUMBER OF ACRES OR OTHER APPROPRIATE MEASURE] for the [SPECIES' NAME] in a manner that will contribute to its conservation.

E. The Parties anticipate that construction, development, or other authorized activities in the Service Area of this Agreement will necessitate the mitigation of impacts on the [SPECIES' NAME] and its habitat.

F. The Service has visited and examined the Property and determined that it is suitable for the uses described in this Agreement. The existing conditions at the Property relevant to the conservation of the [SPECIES' NAME] and the extent of its current utilization by such species are more fully described in writing and with photo documentation in Exhibit C attached hereto.

G. In accordance with the terms and conditions hereinafter provided, the Parties desire to establish a mitigation bank with respect to the Property (referred to as the [NAME] Mitigation Bank) in order to provide for the permanent conservation [OR conservation for at least NUMBER years] of the Property, the use of such land as mitigation as provided in this Agreement, and the sale of Mitigation Bank credits by the Property Owner to third-party purchasers ("Credit Purchasers") in need of such mitigation.

The Parties desire to enter into this Agreement to set forth terms and conditions pursuant to which the [NAME] Mitigation Bank will be established and operated.

DEFINITIONS

1. "Agreement" means this document and its attached Exhibits.

2. "Conservation Easement" means a duly recorded easement that is established to conserve specified biological resources and that imposes certain habitat management obligations on the [NAME] Mitigation Bank lands.

3. "Endowment Fund" means an investment fund maintained by a designated party approved by the Service [and the state fish and wildlife agency IF APPLICABLE] as a nonwasting endowment to be used exclusively for the management of the Mitigation Bank lands in accordance with the Management Prescriptions and the Conservation Easement.

4. "ESA" means the Endangered Species Act of 1973, 16 U.S.C. 1531 et seq., and its implementing regulations.

5. "Management Prescriptions" means the prescriptions attached as Exhibit D that will govern the utilization and management of the Mitigation Bank Lands.

6. "Mitigation Credit" means a credit established and recognized in accordance with Sections 2 or 3 below that may be used by the Property Owner or purchased from the Property Owner by a third party

to mitigate the impacts on [SPECIES' NAME] of authorized activities in the Service Area.

7. "Off-site mitigation" means mitigation that is carried out at a site (a) separate from the site where the project requiring mitigation occurs and (b) owned by someone other than the person undertaking the project requiring mitigation.

8. "Service" means the United States Fish and Wildlife Service [OR the National Marine Fisheries Service].

9. "Service Area" means the geographic area in which the impacts on [SPECIES' NAME] may be mitigated by the use of Mitigation Credits from the [NAME] Mitigation Bank. The Service Area is delineated in Exhibit E attached hereto.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereby agree as follows:

1. Establishment of the [NAME] Mitigation Bank

Upon written approval of this Agreement by the Parties, the Property Owner shall (a) be entitled to receive and use or sell Mitigation Credits as provided in Section 4 below and (b) convey a Conservation Easement (in the form attached hereto as Exhibit F) covering the Property (OR A PORTION OF THE PROPERTY AGREED ON BY THE PARTIES) for conservation purposes and committing the Property Owner to manage the Property in accordance with the Management Prescriptions attached hereto as Exhibit D, which Conservation Easement shall take effect on the date of sale or use of the first Mitigation Credit from the Property. Before the recordation of the easement, any credits used or sold will be made expressly contingent on the subsequent proper recordation of the easement. Upon the use or sale of any Mitigation Credit, the Property Owner shall promptly record the Conservation Easement and, within thirty (30) days after such recordation, provide copies of the recorded Conservation Easement to all Parties.

2. Credits from the Preservation of Existing Habitat

As a result of the conservation benefits accruing to the [SPECIES' NAME] from the preservation of existing habitat at the [NAME] Mitigation Bank and the Property Owner's commitment to manage the land so as to sustain the conservation value of such habitat, the [NAME] Mitigation Bank shall be able to use or sell [NUMBER] Mitigation Credits. The methodology used to determine these Mitigation Credits and the number of

Mitigation Credits to be required for mitigating impacts on the [SPECIES' NAME] in the Service Area is set forth in Exhibit G attached hereto.

3. Credits from the Creation or Restoration of Habitat

In addition to the foregoing, the Property Owner may use or sell up to an additional [NUMBER] Mitigation Credits if the Property Owner succeeds in restoring or creating habitat for the [SPECIES' NAME] as provided in Exhibit H attached hereto. The Service will judge the success of the habitat restoration and creation activities in accordance with the criteria set forth therein.

4. Use and Sale of Credits

The Property Owner shall be entitled to sell Mitigation Credits to others or to apply such Credits to any mitigation requirements applicable to other properties owned by the Property Owner, in the Service Area. Mitigation Credits may serve as mitigation for impacts on the [SPECIES' NAME] only from projects in the Service Area. The methodology for determining the number of Mitigation Credits required for mitigating impacts on the [SPECIES' NAME] from projects in the Service Area is described in Exhibit G attached hereto. The Property Owner shall have the exclusive right to determine the price of any and all Mitigation Credits offered for sale.

5. Endowment Fund

Concurrent with the execution of this Agreement, the Property Owner shall establish, in a dedicated, interest-bearing account, an Endowment Fund, the income from which is to be used exclusively to fund the permanent management of the land in the Mitigation Bank in accordance with the Management Prescriptions after all Credits from such Mitigation Bank have been used or sold and title to such land has been transferred as provided in Section 7 below. The Property Owner agrees to make an initial deposit of $[AMOUNT] into the Endowment Fund upon execution of this Agreement and to make additional payments into it thereafter upon the use or sale of Mitigation Credits in accordance with the Schedule set forth in Exhibit I attached hereto.

6. Accounting for Credits; Transfer of Title

The sale or use of Mitigation Credits shall be accounted for in accordance with Section 8 below. Once all Mitigation Credits have been utilized, the Property Owner shall transfer title to the Property to the Service or to an entity designated by the Service.

7. The Property Owner's Covenants

The Property Owner agrees and covenants for as long as this Agreement is in effect and has not been terminated pursuant to Section 10 below, that the Property Owner:

(a) Shall not discharge or release on the Property, or permit others to discharge or release on the Property, any material or substance deemed "hazardous" or "toxic" under any applicable federal, state, or local environmental laws.

(b) Shall not create any encumbrances to the title of the Property other than those set forth in Exhibit J attached hereto, or execute, renew, or extend any liens, leases, licenses, or similar interests if the proposed encumbrances, liens, leases, licenses, or similar interests would adversely affect the biological values of the Property as determined by the Service, or execute, renew, or extend any leases, licenses, liens, or similar interest covering any lands in the [NAME] Mitigation Bank without the prior written consent of the Service.

(c) Shall not, unless otherwise agreed to in writing by the Service, construct any structures or engage in any development activities on or uses of the Property that degrade biological values.

(d) Shall maintain the biological value of lands in the [NAME] Mitigation Bank to ensure their suitability as habitat for the [SPECIES' NAME].

8. Database for Mitigation Bank Transactions

A database shall be established by the Property Owner in the following manner for the purpose of tracking the use and sale of Mitigation Credits. Until such time as the Service has been notified in writing that all Mitigation Credits have been used or sold and the last annual report has been received by the Service, the Property Owner shall be responsible for maintaining a database (hereafter the "Ledger"), which shall include an accounting of all Mitigation Credits sold or used, the balance of Mitigation Credits remaining and the total amounts deposited in the Endowment Fund, and each individual sale of a Mitigation Credit and shall state the number of Credits sold; the name, address, and telephone number of the entity purchasing the credits; the project name for which the credits were sold; and the location of such project. The Property Owner shall make the Ledger available to the Service upon request. Upon each sale or use of Mitigation Credits in accordance with Section 4 above, the Property Owner shall deliver to the Service an updated accounting of all Credits sold or used as of the date of the most recent conveyance of Mitigation Credits. This information will be sent to the Service within thirty (30) days of each purchase or use of Mitigation Credits. The Property Owner shall, on or before [DATE] deliver to the Service a report covering the prior year that contains all the information described above. Until such time as the Service has been notified that all Mitigation Credits have been sold or used and the final annual report has been received by the Service, the Property Owner shall be responsible for maintaining an accounting of Credits used or sold and the Credit balance remaining.

9. Management of Mitigation Bank Property

(a) The Property Owner shall oversee, manage, and maintain the Mitigation Bank land to preserve its habitat and conservation values in accordance with the terms of this Agreement, the Conservation Easement, and the Management Prescriptions attached hereto as Exhibit D. The Property Owner's management obligations

shall include using reasonable efforts to prevent third-party use of the Property in a manner not permitted under this Agreement or the Conservation Easement. The Property Owner and the Service shall meet and confer from time to time, upon the request of either of them, to revise the Management Prescriptions to better preserve the habitat and conservation values of the Property.

(b) The Property Owner shall immediately prohibit or restrict public access to the Property through fencing, gates, and signs, unless otherwise agreed by the parties. The Property Owner acknowledges the need for the Service to monitor compliance with this Agreement and will cooperate fully in such monitoring. The Property Owner consents to, and will allow, at any reasonable hour, agents or employees of the Service to enter onto the Property. Agents or employees of the Service may inspect the Property and any records or documents required to be kept under this Agreement. Such inspections may include taking photographs, measurements, and samples; interviewing employees, contractors, and agents of the Property Owner; and other actions that the Service deems necessary to monitor compliance with this Agreement.

(c) The Property Owner shall provide the Service with an annual Property Management Report. The Property Management Report shall include the following:

(i) A general description of the status of the [SPECIES' NAME] on the Property.

(ii) The results of any biological monitoring or studies conducted on the Property.

(iii) A description of all management actions taken on the Property.

(iv) A description of any problems encountered in managing the Property and actions taken to address those problems.

(v) A description of management actions that the Property Owner will undertake in accordance with the Management Prescriptions in the coming year.

10. Term of Agreement: Termination Rights

(a) Once the Bank has been established, no conveyance or assignment of any portion of, or interest in, the Bank lands shall be made without the prior written concurrence of the Service, which concurrence will require that the successor or assign assume all the Property Owner's management and other obligations under this Agreement and the Conservation Easement and have sufficient financial capacity to carry out any unfunded obligations under Sections 5 and 7(d) above, in which event such concurrence shall not be unreasonably withheld or delayed. As a condition of granting such concurrence, the Service may require, in its sole discretion, that the transferee deposit a letter of credit or other substantially equivalent security for $[AMOUNT].

(b) The Service may terminate this Agreement if each of the following has occurred:

(i) The Property Owner has breached one or more of the covenants set forth in Section 7 above.

(ii) The Property Owner has received written notice of such breach from the Service.

(iii) The Property Owner has failed to cure the breach within thirty (30) days after such notice; provided, however, that if the breach is curable but in the judgment of the Service cannot reasonably be cured within the thirty (30)-day period, the Service may not terminate the Agreement so long as the Property Owner has commenced the cure of such breach and is diligently pursuing such cure to completion. Nothing in this subsection is intended to or shall be construed to limit the legal or equitable remedies (including specific performance and injunctive relief) available to the Service, except that no Party shall be liable in damages to any other Party for breach of this Agreement.

(c) This Agreement shall end upon the submission of the final annual report to the Service described in Section 9(c) following the use or sale of all Mitigation Credits.

11. Cooperation

The Service recognizes and agrees that both the conservation and the financial success of the [NAME] Mitigation Bank depend on the use or sale of as many of the credits available in the Bank as possible. The Service also recognizes and acknowledges the possibility, under Section 1 above, that Property Owner may be required to convey a Conservation Easement over all or a portion of the Property before all Mitigation Credits associated with the Property or the portion of it subject to the Conservation Easement have been used or sold. Accordingly, the Service agrees to cooperate reasonably with the Property Owner in the implementation of this Agreement, and in particular to cooperate to facilitate the use of sale of unused or unsold Mitigation Credits after a Conservation Easement to the Property or any portion of it has been conveyed. Such Cooperation shall include, but not be limited to, the following:

(a) The Service will confirm to prospective purchasers of Mitigation Credits that Mitigation Credits are available to offset impacts on [SPECIES' NAME] as provided in Section 4 above.

(b) The Service will acknowledge that the [NAME] Mitigation Bank is a Mitigation Bank approved by the Service; include the [NAME] Mitigation Bank on a list to be maintained by the Service of all approved Mitigation Banks; and make the list available to prospective credit purchasers at such time as the need for such credit purchaser's mitigation is evident to the Service.

(c) After the Service has accepted conveyance of a Conservation Easement on the Property or any portion thereof, if any Mitigation Credits associated with such Property or portion thereof remain used or unsold, the Service will not approve the off-site mitigation of impacts on [SPECIES' NAME] (other than the purchase of credits from any approved mitigation bank) for any new project in the Service

Area unless the proponent of such new project has been offered the opportunity to purchase mitigation credits from the [NAME] Mitigation Bank.

12. Modification

This Agreement is not subject to modification except in a writing signed by all Parties. The Parties shall use their good-faith efforts to complete such modifications within ninety (90) days after the initial request is made for a modification by the requesting Party.

13. Notices

All notices, demands, or requests from one Party to another may be personally delivered, sent by facsimile, sent by a recognized overnight delivery service, or sent by mail, certified or registered, postage prepaid, to the following persons:

Property Owner	[Name and Address]
Service	[Name and Address]
Other Parties	[Names and Addresses]

14. Appropriations

The duty of the Service to carry out its obligations under this Agreement shall be subject to the availability of appropriated funds.

15. Dispute Resolution

Unless the Parties agree on another dispute resolution process or unless an aggrieved Party has initiated administrative proceedings or suit in federal court, the Parties may use the following process to attempt to resolve disputes:

(a) The aggrieved Party will notify the other Parties of the provision that may have been violated, the basis for contending that a violation has occurred, and the remedies it proposes to correct the alleged violation.
(b) The Party alleged to be in violation will have thirty (30) days or such other time as may be agreed on, to respond. During this time, it may seek clarification of the information provided in the initial notice. The aggrieved Party will use its best efforts to provide any information then available to it that may be relevant to such inquiries.
(c) Within thirty (30) days after such response was provided or was due, representatives of the Parties having authority to resolve the dispute will meet and negotiate in good faith toward a solution satisfactory to all Parties, or they will establish a specific process and timetable to seek such a solution.
(d) If any issues cannot be resolved through such negotiations, the Parties will consider nonbinding mediation and other alternative dispute resolution processes

and, if a dispute resolution process is agreed on, will make good-faith efforts to resolve all remaining issues through that process.

In witness hereof, the Parties hereto have executed and delivered this Mitigation Banking Agreement as of the date last set forth below.

For the Property Owner: _____

Date: _____

For the Service: _____

Date: _____

For Other Parties: _____

Date: _____

EXHIBITS

Exhibit A--General Location Map
Exhibit B--Legal Parcel Map
Exhibit C--Description of the Property's Existing Conditions
Exhibit D--Management Prescriptions for Mitigation Bank Lands
Exhibit E--Service Area
Exhibit F--Conservation Easement
Exhibit G--Methodology for Determining Credits and Mitigation Requirements
Exhibit H--Credits for Habitat Restoration and Creation Activities
Exhibit I--Schedule of Payments to the Endowment Fund
Exhibit J--Authorized Encumbrances to the Property