

HABITAT CONSERVATION PLAN
FOR THE
METRO AIR PARK PROJECT
IN THE NATOMAS BASIN
SACRAMENTO COUNTY, CALIFORNIA

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EXECUTIVE ABSTRACT

The Metro Air Park Property Owners Association (MAP POA) has applied for a 50-year permit, pursuant to section 10(a)(1)(B) of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (Act), from the U.S. Fish and Wildlife Service (USFWS) for the incidental take of the federally threatened giant garter snake and valley elderberry longhorn beetle and 12 currently unlisted additional species which have been identified as potentially subject to take in the Metro Air Park area (see Table 1). The MAP POA applied on behalf of 138 individual landowners. MAP POA has also applied for take authorization from the California Department of Fish and Game (CDFG) pursuant to Section 2081 of the Fish and State Game Code.

In support of the application, the MAP POA proposes to implement a Habitat Conservation Plan (HCP) to meet the requirement of law for a section 10(a)(1)(B) permit. Some of the species shown in Table 1 are listed under the state or federal ESAs while others are currently unlisted. All fourteen "covered species" are subject to take under the HCP to the extent take of such species is prohibited under federal and state law. The listed species will be included in the incidental take permits immediately upon permit issuance. The permits will become effective for the unlisted species when those species are actually listed under either the ESA or CESA. The proposed incidental taking would occur within the 1,892-acre Metro Air Park Special Planning Area (MAP SPA), and on 123 acres of lands outside the MAP SPA within Sacramento County, California (refer to Figure 1, Regional Location and Figure 4, Off-Site Improvements for area of incidental take authorization). Take could occur as a result of development of the Metro Air Park industrial park project approved by the County of Sacramento, from rice farming, and from management of reserve lands.

The HCP and attached Implementation Agreement (IA) delineate the responsibilities of the MAP POA, the USFWS, the CDFG, and the Natomas Basin Conservancy (NBC) which is the Plan Operator, and are intended to enable the construction of the Metro Air Park Industrial Park (MAP project) in the Natomas Basin to proceed in such a way as to result in conservation of the target area's biological resources. The MAP project intends to minimize and mitigate impacts of the project through participation in the conservation program originally set up for the entire Natomas Basin which is described in the Natomas Basin Habitat Conservation Plan (NBHCP), published by the City of Sacramento, November 1997, as modified by the MAP HCP. Although the MAP HCP supports and follows the regional conservation strategy set forth in the NBHCP and relies on the NBC, the NBHCP plan operator, to implement the MAP HCP conservation program, the MAP HCP is independently viable and does not depend on implementation of the NBHCP to achieve its conservation goals. Even so, if the regional conservation strategy is modified in a future revised NBHCP, the MAP HCP and IA include a provision for the automatic incorporation of such modifications into the MAP HCP.

The MAP POA would pay a mitigation fee based upon the number of acres disturbed by development. The fee is currently \$5,993 per gross developed acre. On behalf of MAP POA, the NBC is required to acquire habitat mitigation land at a 0.5:1 ratio (one half acre for every one acre developed). At full build-out, with all off-site infrastructure completed, MAP POA is expected to develop 2015 acres of land. The habitat mitigation land obligation at full build out is half of that or 1007.5 acres. To mitigate for the loss of Swainson's hawk nest trees on-site, MAP

POA will secure or provide funds to the NBC to secure an additional 200 contiguous acres, in perpetuity, and transfer the lands, along with related Administration, Endowment and Habitat Management Mitigation Fees. The NBC will hold and manage the reserve lands for the benefit of Swainson's hawk nesting. Thus the total habitat mitigation land obligation for the MAP project is 1207.5 acres.

The MAP HCP addresses the five policy initiatives that are included in the Final Addendum to the Handbook for Habitat Conservation Planning and Incidental Take Permitting Process. The five policy initiatives are: (1) biological goals and objectives, (2) adaptive management, (3) monitoring, (4) permit duration, and (5) public participation.

The biological goals and objectives of the MAP HCP are consistent with those identified in the 1997 NBHCP. Those objectives, as stated in the NBHCP, are contained in Appendix A of this HCP. Note that those objectives may be modified, if and when a revised NBHCP is approved by USFWS. Through participation in the mitigation program for the NBHCP, the MAP HCP includes adaptive management provisions (refer to Section III. E of the MAP HCP and Section IV. E. of the NBHCP) and biological monitoring of the covered species (refer to Section IV. F. of the NBHCP). In addition, the MAP HCP requires monitoring of development activities and an accounting of mitigation land established using mitigation fees (refer to Section III. D. of the MAP HCP).

The 50-year requested permit duration is appropriate for the MAP project as it reflects the expected long-term build out of the MAP project. The fifth initiative under USFWS's five-point policy pertains to public participation in the HCP process which takes place during pre-permit processing. In response to the policy, the MAP HCP provided a 60-day public comment period rather than a 30-day period. Furthermore, the NBHCP, upon which the MAP HCP is based, was subject to extensive public review through the City's CEQA process (Initial Study and Negative Declaration, 6/97), and the Federal Review process (NEPA Environmental Assessment, December 1997).

Note that all figures are located at the end of the document.

TABLE 1
LISTED, CANDIDATE, AND OTHER SPECIES COVERED BY THE METRO AIR
PARK PERMITS *

HABITAT & SPECIES	FEDERAL STATUS	STATE STATUS	HABITAT NOTES
WETLAND ASSOCIATED SPECIES			
Aleutian Canada goose <i>Branta canadensis leucopareia</i>	Delisted 2001		Grazes in marshes and stubble fields, roosts on the water
Swainson's hawk <i>Buteo swainsoni</i>		T	Breeds in riparian forest; known nesting sites in trees along Sacramento River in Natomas Basin
giant garter snake <i>Thamnophis gigas</i>	T	T	Forages in low gradient open waterways and flooded rice fields, hibernates in canal berms and other uplands; several known occurrences in Natomas Basin
white-faced ibis <i>Plegadis chihi</i>	SC	SSC	Forages in flooded rice fields
bank swallow <i>Riparia riparia</i>		T	Nests in riverbanks, forages for insects over open water, croplands, and grasslands
peregrine falcon <i>Falco peregrinus anatum</i>	Delisted 1999	E, FP	Preys on birds, including waterfowl in and around wetlands
greater sandhill crane <i>Grus canadensis tubida</i>		T, FP	Forages in moist croplands with stubble and emergent wetlands
tricolored blackbird <i>Agelaius tricolor</i>	SC	SSC	Nests in marshes with bulrush, blackberry or cattails; three known occurrences in Natomas Basin
northwestern pond turtle <i>Clemmys marmorata</i> <i>marmorata</i>	SC	SSC	Lives in permanent bodies of water; requires floating vegetation, logs, rocks or banks for basking

HABITAT & SPECIES	FEDERAL STATUS	STATE STATUS	HABITAT NOTES
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T		Lives and reproduces on elderberry shrubs found along rivers and canals
Delta tule pea <i>Lathyrus jepsonii ssp.jepsonii</i>	SC		Perennial twining vine occurs in both riparian and marsh habitats
Sanford's arrowhead <i>Sagittaria sanfordii</i>	SC		Tuberose perennial likely in drainage or irrigation ditches
UPLAND ASSOCIATED SPECIES			
Swainson's hawk <i>Buteo swainsoni</i>		T	Forages for small mammals in grasslands and croplands
Tricolor blackbird <i>Agelaius tricolor</i>	SC	SSC	Forages on the ground in grasslands and croplands; three known occurrences in Basin
Loggerhead shrike <i>Lanius ludovicianus</i>	SC	SSC	Prefers open habitats with scattered shrubs, trees, fences, and posts. Will use cropland.
Burrowing owl <i>Athene cunicularia</i>		SSC	Prefers open, dry grassland and desert habitats

*Note that some species occur in more than one habitat category and thus are listed twice. A total of 14 species are included in Table 1 and are covered by the permits.

Key to Abbreviations

Federal

E = Listed as endangered

T = Listed as threatened

C = Candidate for federal listing, data sufficient

SC = Species of Concern -- informal category, formerly called candidate 2 species (data for listing insufficient)

State

E = Listed as Endangered

T = Listed as Threatened

FP = Fully Protected

R = Listed as Rare

SSC = Species of Special Concern

I. INTRODUCTION

The Metro Air Park (MAP) project is contained within the much larger Natomas Basin. The MAP Habitat Conservation Plan (HCP) calls for participation in the multi-species conservation program established under the Natomas Basin Habitat Conservation Plan (NBHCP) to minimize and mitigate the expected loss of habitat values on its 1,892-acre property and on the 123-acre off-site infrastructure improvement area. The NBHCP was prepared as a regional plan for the entire Natomas Basin. The NBHCP promotes biological conservation along with economic development and continuing agriculture.

Implementation of the MAP HCP, however, is independent of the NBHCP and the MAP HCP does not rely on implementation of the NBHCP to mitigate for the impacts of the MAP development.

A. Site description

The 1,892-acre MAP project site is located northwest of the City of Sacramento in Sections 20, 29, and 32 of Township 10 North, Range 4 East, USGS Taylor Monument 7.5 minute quadrangle map in the unincorporated area of Sacramento County, California (Figure 1, Regional Location). The site is located immediately east of the Sacramento Metropolitan Airport on the north side of Interstate 5.

The site is located in the 53,341-acre Natomas Basin an agricultural/rural area. The site is primarily flat agricultural land with occasional wetlands, irrigation and drainage ditches, and a few agricultural related structures and rural residences. The agricultural ditches support a variety of riparian vegetation such as cattails, willows, alders, thickets of blackberry, and various perennial and annual riparian plants.

B. History of Conservation Planning Process

During the period 1994-1996, the Sacramento Area Flood Control Agency (SAFCA) developed the Draft Natomas Basin Habitat Conservation Plan (NBHCP). The plan was intended to guide development, conservation, and other land use decisions throughout the Natomas Basin. It was also intended to support expected Endangered Species Act (ESA) Section 10(a) (1)(B) and California Endangered Species Act (CESA) Section 2081 permit applications from affected land use agencies, water companies, or other entities with relevant land use authorities or activities within the Natomas Basin (i.e., City of Sacramento, Sacramento County, Sutter County, Reclamation District 1000 (RD1000), and the Natomas Central Mutual Water Company (NCMWC)). The NBHCP was developed as a regional plan to provide a regional conservation strategy for the protection and conservation of threatened, endangered and sensitive species and their habitats in the Natomas Basin. While each affected entity in the basin is free to submit its own HCP, it was anticipated that most would either adopt the NBHCP or prepare a separate HCP compatible with the regional plan.

In 1996, the City of Sacramento developed a modified version of the previous HCP and submitted a separate incidental take permit application for land within its jurisdiction in the Natomas Basin. The City received an incidental take permit (PRT-823773) from the USFWS on

December 31, 1997 for 24 species including the 14 species proposed to be covered by the MAP permit. The City of Sacramento's NBHCP is referred to as the "Regional HCP" because the City's NBHCP, like the earlier SAFCA draft plan, describes the regional mitigation program for the entire Natomas Basin.

The primary mitigation measures in the approved City NBHCP, dated November 1997 are summarized below:

The Natomas Basin Conservancy (NBC) will serve as Plan Operator and carry out habitat acquisition and management activities set forth in the NBHCP. The NBC was formed as a non-profit California corporation in 1994.

A system of habitat mitigation lands or reserves will be established which will provide wetland and upland habitat values for giant garter snake, Swainson's hawk, and other species. The NBHCP requires that one-half acre of mitigation land be conserved for each acre of land that is developed in the Basin.

The mitigation land will be acquired using mitigation fees paid by developers. Fees will be paid based on the gross acres of land approved for development. An initial base fee of \$2,656 per acre was established through a funding study that was prepared by Economic and Planning Systems, Inc. This fee was increased in September 2000 by the City Council to \$3,941, and again in June 2001 to \$5,993. The annual fee will be adjusted for inflation each year and, as necessary, to reflect increases in operation and land costs, adaptive management, and plan modifications resulting from GGS Recovery Plan implementation.

Individual landowners must conduct pre-construction surveys for covered species and, depending on the results of the surveys, implement specific minimization measures to reduce direct take of covered species on specific development sites.

One habitat block for the wetland reserve system must be a minimum of 2500 acres in size and the balance of wetland reserve lands must be in habitat blocks a minimum of 400 acres in size.

The wetland reserves in the Natomas Basin must be hydrologically connected to the existing system of canals and ditches and must have an adequate water supply and adequate water rights.

The habitat reserves must be adequately buffered from the effects of adjoining land uses, including public roads.

The NBHCP's mitigation program summarized above is also referred to as the "regional mitigation program" throughout this document.

The MAP project is outside of the City limit lines, thus the project can not be covered by the City's incidental take permits and because the County has not applied for permits for its portion of the Natomas Basin, the Metro Air Park Property Owners Association (MAP POA) is seeking separate incidental take permits for the MAP project.

A federal court ruling on August 15, 2000, held that the USFWS decision to issue the City's permit and its decision not to prepare an Environmental Impact Statement (EIS) for the project were arbitrary and capricious. The City, along with Sutter County, is preparing a revised HCP for the Natomas Basin that will address the court's concerns and support the issuance of a new permit to the City and issuance of a permit to Sutter County. The MAP HCP addresses the concerns of the court as they pertain to the MAP project.

On May 10, 2001 a Settlement Agreement was executed by several environmental groups (plaintiffs in the aforementioned law suit), the City of Sacramento and Natomas Basin developers. The Agreement addresses a request by the City/developers to carry out limited development on 1,668 acres within the City's Permit Area pursuant to City-issued grading permits. The Agreement establishes enhanced conservation of the areas surrounding Fisherman's Lake, establishes reserves in one or two important presently unprotected habitat areas in the Natomas Basin area of Sacramento County, and ensures compliance with the protections established in prior environmental documents.

The Agreement allows the City to issue grading permits for up to 1068 acres of land prior to acquiring mitigation lands for such development. Once the 1068-acre threshold is reached, however, mitigation lands for the 1068 acres must be acquired before any additional grading permits are issued. Thereafter, mitigation lands must be acquired for each acre of the additional 600 acres of development allowed under the Agreement prior to the issuance of grading permit for that acre.

The Agreement specifically provides for the protection and maintenance of the Fisherman's Lake area which is important habitat for both the giant garter snake and Swainson's hawk, as well as other species. The Agreement requires that at least one parcel of land approximately 100 acres in size be acquired by the NBC prior to the issuance of any grading permits. An additional 250 acres of land must be acquired in identified zones in Sacramento County prior to the City issuing grading permits on more than 1360 acres of land.

The City's Settlement Agreement does not directly affect the MAP HCP.

C. Project Description

1. Development of Metro Air Park Project

The MAP HCP calls for participation in the multi-species conservation program established under the NBHCP to minimize and mitigate the expected loss of habitat values. The MAP POA would pay a mitigation fee based upon the number of acres disturbed by development. On behalf of MAP POA, the NBC is required to acquire habitat mitigation land at a 0.5:1 ratio (one half acre for every one acre developed). To mitigate for the loss of Swainson's hawk nest trees on-site, MAP POA will, either on its own or by providing funds to the NBC, secure 200 contiguous acres, in perpetuity. Under either option, the lands and fees to manage the lands will be turned over to the NBC to manage for the benefit of Swainson's hawk nesting. The mitigation will be implemented commensurate with the impact and will be funded sufficiently to manage the site.

The MAP Park project consists of the development of 1,892 acres with a combination of commercial, industrial, manufacturing, and airport related land uses (see Figure 2, Land Use Plan). The land use plan assessed in the Final Environmental Impact Report (FEIR), would result in the creation of:

- 617 acres of light manufacturing
- 296 acres airport related
- 167 acres office-retail/high tech/Research and Development
- 344 acres commercial
- 127 acres commercial professional offices/Corporate Headquarters
- 278 acres open space/golf course
- 58 acres roads and freeway interchange

Actual land use types and acres may vary from the above list subject to County review and approval. Land uses are distributed along a north/south central open space/recreation corridor to maximize the relationship between property frontage and open space. The open space and golf course are designed for draining water off the property during periods of heavy rain. The intent of the land use plan is to encourage the growth of land uses from two distinct core areas. This is an important feature of the plan as it would balance development pressure over time. Principal access to the project is via Elkhorn Boulevard extension and the proposed Metro Air Parkway linking Interstate 5 with Elverta Road. A FEIR for the Metro Air Park Special Planning Area (MAP SPA) was certified in August 1993 by the County of Sacramento. Modifications to the MAP SPA were proposed in 1997 and were the subject of a Supplemental EIR (SEIR). The Sacramento County Planning Commission held a public hearing on the SEIR on June 9, 1997. The Planning Commission recommended approval of the proposed Zoning Ordinance Amendments. The Sacramento County Board of Supervisors approved the project and certified the SEIR on September 10, 1997.

Development of the project area is being overseen by the MAP POA. The project area comprises 56 separate planning units. Although a specific plan for the phased development of the site has not been prepared, it is expected that development will take place over a fifty year period, being built in logical units as the market demands. Individual landowners will be covered by the incidental take permits if they are members of MAP POA (described in III.A.2 below), have signed MAP POA's covenants, conditions, and restrictions (CC&Rs) included as part of Exhibit G to the Implementation Agreement (IA), and have complied with specific mitigation measures contained in this HCP and its accompanying IA. Individual(s) or entities not members of MAP POA are not covered by this HCP.

"Tier One" initial on and off-site infrastructure improvements are required to allow development of the site. MAP POA will oversee construction of the Tier One improvements and payment of mitigation fees which will be funded through a Mello Roos (described in III.B.1) or a similar bonding mechanism. The improvements include extending Metro Air Parkway from I-5 to Elverta Road, extending Elkhorn Boulevard from Powerline Road to Lonetree Road, and installing drainage improvements along the golf course and south of Elkhorn Boulevard (Figure 3, Initial On-site Infrastructure Improvements). Also included is the installation of a new sewer trunk line to be contained within the proposed future Meister Way right-of-way from Metro Air Parkway to Highway 99 right-of-way, and then proceed south along Highway 99 to I-5 and the

Natomas Interceptor. Approximately 190 acres will be permanently disturbed to install the Tier One infrastructure improvements. Specific improvements and affected areas are contained in Table 2.

TABLE 2
TIER ONE INITIAL ON AND OFF-SITE INFRASTRUCTURE IMPROVEMENTS

INITIAL ON-SITE INFRASTRUCTURE IMPROVEMENTS	AREA (acres)
Elkhorn Boulevard	13.4
Metro Air Parkway	33.3
Freeway Embankment	28.3
Earthwork Balance & Offsite NCMWC Facilities	10.9
Road "B" /Meister Way Outfall	5.8
Road "G" Drain Line	3.8
Detention/Water Quality Facilities	47.7
Sewer Lift Station	0.3
Pump Station - 1 Sites	0.5
Well Sites - 2 Sites	0.4
Storage Reservoir and Booster Pump	3.5
Water Treatment Plant Site	1.5
Off-Site Sewer Line Extension	41.0
TOTAL	190.4

As Figure 3 indicates, development of the initial on-site infrastructure improvements would not affect current farming practices as they primarily involve roadway and drainage improvements. The drainage improvements would not affect water deliveries to agricultural lands. As many as 650 additional acres would be temporarily disturbed by initial project grading, but will be returned to their original agricultural land use upon completion of initial grading work. Most of the 650 acres to be temporarily disturbed are currently fallow.

Once the Tier One infrastructure improvements are completed by the MAP POA, individual landowners will submit site specific plans for each of the planning units and must obtain separate grading and building permits from the County as development proceeds. Individual landowner site development projects are part of the "Tier Two" development. MAP POA will regulate actions of landowners through CC&R's. Refer to Sections 3 and 4.3.4 of the IA for specific obligations of each of the MAP HCP participants.

2. Off-Site Infrastructure Improvements

The Metro Air Park project requires off-site drainage, sewer, and roadway improvements that would result in additional habitat loss both within Sacramento County and within a small area of the City of Sacramento. These off-site improvements would be covered by MAP POA's incidental take permit and would be mitigated in accordance with this HCP. Except for the sewer line extension, all off-site improvements will be constructed as part of Tier Two development. The off-site improvements covered are:

a. Drainage Facilities

All of the off-site drainage facilities are maintained by RD1000. Several off-site drainage facilities are needed to maintain the pre-project stages of all drainage facilities that exist downstream of the project. This will be accomplished by detaining 50% of the increase in on-site project flows and improving Reach 8, and replacing and upsizing some existing culverts. Upsizing the culverts will not change the canal configuration just the size of the culvert. The improvement of Pump Station No. 3 to convey project flows to the Sacramento River is being accomplished under separate permits by RD1000. Table 3 provides the area of impact estimated for each of the proposed RD-1000 off-site drainage improvements. The locations of the off-site drainage improvements are shown in Figure 4 and are numbered as indicated below in the Figure. Specifically, the improvements consist of:

Del Paso Road Culvert. Replace and upsize the culverts at Del Paso Road and West Drain Canal.

Power Line Road Culverts. Replace and upsize the culverts at Power Line Road and Canal Reach 5/7.

Canal Reach 4/5 Culverts. Replace and upsize culverts between canal Reach No. 5 and Canal Reach No. 4.

Canal Reach No. 8 Improvements. Acquire all required off-site drainage rights-of-way from the on-site pump station outfall to canal Reach No. 7. Widen and deepen Reach No. 8 and flatten side slopes to 2:1 and increase the capacity of I-5 culverts by jacking 2-78" culverts under I-5 parallel to the existing box culvert once the project pump station discharge demand exceeds 150 cfs. This canal currently has a width that ranges from 27 to 30 feet and a depth from 5 to 9 feet with a side slope range of 1:1 to 1.5:1. The upsized Reach 8 canal will have a final width ranging from 59 to 73 feet, a depth ranging from 9 to 13 feet, and a side slope of 2:1. The side slopes will be revegetated with appropriate plantings.

Airport/NCMWC Irrigation Pump. Install an irrigation pump and drainage ditch south of

I-5 on the airport property. Once the Miester Road canal is filled, NCMWC will need an alternative route to supply irrigation water to the Airport property north of Interstate 5 and south of the east runway. The new pump will be installed south of I-5 along reach 4/5 and will pump water north via existing canals to the Airport property north of Interstate 5. The pump installation will take place prior to the Miester Road canal being taken out of service.

b. Sewer Facilities

Currently there are no Sacramento Regional County Sanitation District (SRCSD) sewer facilities located within the MAP development boundaries. The SRCSD plans to provide service to the MAP site through connection with the Natomas Interceptor which currently terminates at Del Paso Road and the Interstate 5 freeway, approximately two-miles south of the project boundary. The proposed route of the new trunk line is shown in Figure 4. It would be located within the proposed future Meister Way right-of-way from Metro Air Parkway to Highway 99 right-of-way, and then proceed south along Highway 99 to I-5 and the Natomas Interceptor. There is an alternative alignment from Elkhorn Road/99 to the Interceptor which is more northerly and would add about 6 additional acres of disturbance (refer to Figure 4). The alternative alignment is roughly 500 feet longer than the proposed alignment. Under the worst case scenario, the sewer installation would require a 100 foot wide by 17,700 foot long construction envelope and would affect 41 acres of land (see Table 3).

c. Roadway Improvements

Elkhorn Boulevard from Power Line Road to the Sacramento Airport. This extension of Elkhorn Blvd. from off of the MAP site to the Airport (Airport Boulevard/Crossfield Drive) would provide a direct connection from the MAP site to the Airport. The roadway would consist of one 13-foot car lane and a seven-foot bike lane in each direction. Construction of this roadway would impact 14 acres of off-site land (see Figure 4 and Table 3).

South Bayou Road Improvements are necessary to upgrade a non-standard section of roadway and to relocate South Bayou Road around the proposed I-5/Metro Air Parkway interchange. South Bayou, from Power Line Road to 2000 feet east of Metro Air Parkway would be improved to two-lane arterial standards. There would be a 60 foot right-of-way with 60-feet of pavement to provide one 12-foot lane and one four-foot shoulder in each direction. Drainage would consist of a roadside ditch. Construction of these improvements would impact as much as 16 acres of land. See Figure 4 for project location.

Elkhorn Boulevard Widening between Lone Tree Road and State Route 99. Elkhorn Boulevard would be widened to three lanes in both the east and west bound directions. Shoulders would be included. Construction of this project would impact as much as 14.7 acres.

Elverta Road Widening between Lone Tree Road and State Route 99. Elverta Road would be widened to two lanes in both the east and westbound directions. Shoulders would be included. Construction of this project would impact as much as 9.7 acres.

Meister Way Extension between Lone Tree Road and State Route 99. Meister Way

would be developed into a four-lane roadway from Lone Tree to State Route 99. The disturbance associated with the new roadway would be included in the land area needed to install the sewer extension.

Improvements to Del Paso Road from Power Line Road to Sacramento City Limits.

Improvements include reconstructing existing road to two-lane arterial standards and installing signals at South Bayou Road. The existing 26-foot roadway would be widened to 42 feet and would include a wider traffic lane as well as pull-off shoulders.

Improvements to Power Line Road from I-5 to Del Paso Road.

Improvements include overlaying existing pavement, widening each side to two-lane arterial standards and installing signals at Power Line Road. The existing 26-foot roadway would be widened to 42 feet and would include a wider traffic lane as well as pull-off shoulders.

In total, about 123 acres of land would be affected by the off-site infrastructure improvements. MAP POA will oversee construction of the off-site infrastructure improvements and payment of mitigation fees which will be funded through the same Mello Roos bond (or a similar bonding mechanism) that funds the initial infrastructure improvements (see discussion of bonding mechanism, section III.B Funding). The off-site sewer installation will coincide with the on-site Tier One improvements adding about 41 acres to the total area disturbed during Tier One construction.

TABLE 3
OFF-SITE INFRASTRUCTURE IMPROVEMENTS

PROJECT	IMPACT	ACREAGE
RD-1000 Off-Site Drainage Improvements		
Del Paso Culvert	200'x200' work area	1.0
Power Line Road Culvert	200'x200' work area	1.0
Canal Reach 4&5 Culverts	100' wide x 400' long construction envelope	1.0
Off-Site Reach No. 8 Improvements	125' wide x 5,600' long construction envelope	16.1
Airport/NCMWC Irrigation Pump	50' wide x 4,000' long construction envelope	4.6
Sub-Total		23.7
Off-Site Sewer Improvements		

Meister Way/99/I-5 Trunk Line or Elkhorn Road/99/I-5 Trunk Line	100' wide x 17,700' long construction envelope (worst case)	40.7 (approx. 14 acres of the total is within the City limits)
Off-Site Roadway Improvements		
Elverta Road Improvements Lone Tree to 99		9.7
Elkhorn Blvd. Improvements Lone Tree to 99		14.7
Meister Way Extension to 99	disturbance area included in sewer line extension area. No additional disturbance.	0.0
Elkhorn Blvd. Extension to Airport		14.0
Del Paso Road from Power Line Road to City Limits, Improvements		2.0
Power Line Road from I-5 to Del Paso Road, Improvements		2.0
South Bayou Road Improvements		16.0
Sub-total		58.4
GRAND TOTAL		122.8

3. Site-specific Surveys and Canal Revegetation

Site-specific surveys including biological surveys have not been completed for MAP's off-site infrastructure improvement projects. The estimated total number of acres proposed to be affected by the off-site infrastructure projects is 123 acres and covered species are the only species anticipated to be affected by the infrastructure projects. MAPPOA will conduct the wildlife agency approved pre-project surveys including, but not limited to, biological surveys and provide the data and results to the USFWS and the CDFG to review. If during the pre-construction surveys it is determined that the total acres of land, type of habitat, or effects on covered species are greater than permitted, or uncovered listed species will be affected, then the permit must be amended, and MAPPOA will be responsible for payment of any additional

mitigation fees prior to any ground disturbance for those off-site projects. MAPPOA also will provide the USFWS and CDFG with post-project reports for all off-site infrastructure improvements

During the construction of off-site infrastructure projects, all habitat for listed vernal pool crustaceans will be avoided. All construction impacts (temporary or permanent), including direct and indirect effects, shall be kept a minimum of 250 feet from all vernal pool crustacean habitat and not affect the hydrology of the habitat.

Prior to implementation of any off-site canal improvements, a revegetation plan will be developed. The plan should replace any riparian vegetation removed due to construction activities and restore the canal to pre-construction conditions. The revegetation plan will include an analysis of pre-project habitat conditions, the impacts to the habitat that will occur due to construction and construction related activities (staging, borrow sites, access, etc.), and those measures necessary to restore the canal to the pre-project habitat conditions. Plantings should include appropriate native species, and where possible should include use of native grass seed. The revegetation plan will be submitted and approved by the USFWS and CDFG prior to implementing any canal improvements.

4. Rice Farming

Rice has historically been one of the agricultural products farmed on and around the MAP project site. Although rice is not being farmed on the MAP site at present, it could be farmed in the future until development of the MAP project phases out agricultural uses. Rice fields currently provide primary habitat for giant garter snake in the Natomas Basin. Because giant garter snakes use rice fields during most of the growing season, it is possible that individual snakes may be taken incidentally to normal rice farming. Consequently, landowners, who are members of MAP POA, and who choose to grow rice in a manner that benefits wetland species, including the periodic rotation of rice fields to other crops with the exception of orchards or vineyards, shall be covered for incidental take under the Section 10(a)(1)(B) and 2081 permits. In order to be covered for incidental take for rice farming MAP POA landowners, or their leasees shall employ Best Management Practices approved by USFWS and CDFG (Appendix C) to maximize compatibility of this land use with the protection of giant garter snakes and must also sign binding legal documents (Certificate of Inclusion) with MAP POA. Refer to IA for specific requirements on participation.

The permits would not cover the destruction of giant garter snake habitat through actions not normally associated with rice farming or the cultivation of agricultural crops that are not the result of periodic rotations from rice. Take resulting from pesticide (includes herbicides, rodenticides, fungicides, bio-controls) use in the MAP permit area is not covered under the MAP HCP and remains subject to the state and federal endangered species acts and other federal and state regulations which apply to pesticide use.

5. Continued Agricultural Uses on MAP Site

To protect habitat values on existing agricultural lands (see Section II.A.1), the following provision applies: any existing agricultural land in the MAP area will be subject to the payment of development mitigation fees if the landowner voluntarily elects to take land out of agricultural

production for a period of more than one year prior to the receipt of development permits on the land to which they apply or if lands are left fallow (not seeded) for over a period of three years. In addition, any lands temporarily disturbed as a result of initial infrastructure (Tier One) development that are not returned to agricultural use within 12 months of completion of the improvement, will also be subject to the payment of development mitigation fees.

6. Installation of Giant Garter Snake Deterrent along Lone Tree Road

The design will include a feature that prevents GGS from accessing Lone Tree Road or the MAP site itself. The design may include physical and/or vegetative barriers to prevent snakes from entering the roadway where snakes experience an increased risk of mortality, and should also include features to prevent snakes from becoming trapped on the MAP (western) side of the feature. The design plans will also include measures to avoid and minimize take of GGS during installation and a maintenance plan to ensure that the barrier continues to function over the life of the MAP HCP. A monitoring plan will also be developed to determine the effectiveness of the design in preventing snakes from accessing the roadway and the MAP site. Monitoring may include mark-recapture studies, radio telemetry studies, or other study methods that will allow MAP POA to determine the effectiveness of the design in protecting giant garter snakes. The design, maintenance, and monitoring plans will be submitted for USFWS review and approval prior to construction of Lone Tree Road.

D. Biological Goals and Objectives

A goal of the NBHCP was to establish a multi-species conservation program to mitigate the incidental take of covered species and expected loss to habitat values that will result from urban development. The MAP HCP shares this primary goal and is designed to contribute to the creation of a system of wetland reserves, with associated uplands, that will support populations of the giant garter snake, Swainson's hawk and other covered species. The conservation of wetland habitat values focuses on the state and federally listed giant garter snake while the conservation of upland habitat values focuses on the state listed Swainson's hawk. Implementation of these strategies will also provide for the habitat requirements of the other species covered by the MAP HCP. MAP POA's HCP will contribute land, and land acquisition and management funds to the NBC to assemble the reserve system.

The following are the biological objectives for the giant garter snake under the MAP HCP:

- (1) Maintenance of a long-term viable population of giant garter snakes in the Natomas Basin.
- (2) Mitigation for impacts of urbanization on the giant garter snake and other covered species through development of a biologically sound network of habitat reserves that contribute to the recovery of these species.
- (3) Reserves described in (2) above will consist of habitat blocks a minimum of 400 acres in size, consisting of both wetland and upland habitat, with an interlinking network of water supply channels or canals.

(4) Improvement of giant garter snake habitat values in reserve areas in the Basin through habitat creation, protection and enhancement; reduction in mortality sources.

The following are the biological objectives for the Swainson's hawk under the MAP HCP:

(1) Retention and creation of sufficient quality nesting and foraging habitat to maintain existing Swainson's hawk population levels in the plan area, and allow for population increases to meet any future recovery goals (as defined by the forthcoming CDFG's Swainson's Hawk Recovery Plan).

(2) Acquisition or protection of sufficient foraging habitat to support breeding and successful fledging of young by hawks nesting within the Natomas Basin.

(3) Prevention and/or mitigation of disturbance to and loss of Swainson's hawk nest trees throughout the plan area.

(4) Acquisition of habitat lands for Swainson's hawks within the Natomas Basin only (i.e., no out-of-Basin acquisitions for the Swainson's hawk is permitted under the Plan).

(5) Establishment of a tree planting program to provide for future Swainson's hawk nest trees within the regionally designated Swainson's hawk zone (area within 1 mile of the Sacramento River) or to establish new nest sites in the eastern portions of Natomas Basin (including, but not limited to, areas along the levees and Natomas East Main Drain). However, no trees will be planted within water conveyance or flood control ditches or canals where such plantings would interfere with the function of these facilities.

II. BIOLOGICAL DATA AND SPECIES OF SPECIAL CONCERN

A. Environmental Setting

Agriculture is the dominant land use in the Natomas Basin and on the MAP project site. The predominant crops in the Natomas Basin are rice, corn, sugar beets, grain, tomatoes and pasture lands. The overall topography remains -- the Basin is still a shallow bowl -- but the irregular small-scale topographic features have largely been eliminated by agriculture. The drainage pattern of the Basin has been altered so that runoff is pumped into the surrounding canals and the Sacramento River at several places. Even with pumping, significant portions of the area are subject to shallow flooding from rain falling in the Basin that cannot be conveyed quickly enough to external drainage systems.

Natural and uncultivated vegetation types are interspersed throughout the agricultural areas of the Natomas Basin. See Figure 5, Current Native Habitats. Natural areas are found primarily along irrigation canals, drainage ditches, pasture and uncultivated fields. The borders of drainage canals are often associated with narrow strips of emergent vegetation (cattails and bulrushes) and/or wooded riparian areas. The presence of water conveyance systems among the mosaic of agricultural fields and riparian areas, provide important nesting, feeding and migration corridor habitat for a variety of wildlife species inhabiting the Plan area.

1. Habitat Communities

Agriculture. Today some 40,000 acres of land in the basin are under cultivation or lie fallow. Rice has been a principal crop grown in the Natomas Basin with roughly 20,000 acres grown annually (AGA). Other crops include wheat (4,000 AGA), sugar beets (3,500 AGA), safflower (2,500 AGA), corn (2,500 AGA) and tomatoes (1,000 AGA).

Recently, urban development has begun within the Basin and is displacing some of the agricultural croplands. Between 1993 and 1999 there was a net increase of approximately 2000 acres of urban land in the Basin. Cropland was reduced by 1,600 acres as a result of the development, mostly within the City of Sacramento.

Nearly 100 percent of the 1,892 Metro Air Park project site has been converted to agricultural uses. Agricultural fields are linked with an intertwining network of canals, ditches, and the open water habitat described below. Although cultivation patterns shift from year to year due to market conditions, prior to 1998 roughly 1,000 acres of the project site were routinely maintained in irrigated rice cultivation. Since 1998 all rice farming on the site has ceased. In 1998 over 1,500 acres were in fallow agriculture and from 1999 to May 2001 over 1,700 acres of the site were in fallow agriculture. A site visit in May 2001 found some of the fallow fields choked with tall weeds, while other areas had been disced or mowed.

Cropland in the Natomas Basin has become an important habitat for some species, although it generally lacks native vegetation. Rice fields are typically flooded for 5 months during the summer, creating a man-made/constructed type of "wetland". Supplemental winter flooding of the rice fields for waterfowl hunting creates overwintering habitat for shorebirds, egrets, herons, and many species of migratory waterfowl. These include mallard, pintail, snow and white-fronted geese, American widgeon, green-winged teal and gadwall. They feed on the rice left over from harvesting, aquatic plants, and tubers and invertebrates. The giant garter snake, a state and federally listed threatened species, is also found in this habitat.

Other agricultural lands support varying levels of wildlife, depending on the crop type, rotation period, and frequency and type of associated disturbances. Fallow fields and other ruderal uplands support nesting bird species such as ring-necked pheasant, northern harrier, American bittern, short-eared owl, and mallard. However, fallow fields that are choked with weeds no longer provide good foraging habitat for birds. Grain and row crops support high rodent populations important to the state listed Swainson's hawk (*Buteo swainsoni*) and the burrowing owl (*Athene cunicularia*), black-shouldered kite, red tailed hawk, and short-eared owl.

Open Water Aquatic Habitat & Ditches & Drains within the Natomas Basin as well as on the project site are found where standing or slow moving water is at least 5 to 6 feet deep and can be either natural or man-made. There is an approximately 140 mile network of major canals, ditches, and drains in the Natomas Basin resulting from the historic and ongoing agricultural uses in the Basin. Individual parcels have additional minor irrigation and drainage ditches.

Prior to 1998 the MAP project site contained approximately 12 miles of canals, ditches and drains used in the farming operations which, when in full use, represented 76 acres of open water and adjacent banks (1993 EIR). Since 1998, however, the length of canals, ditches and drains that routinely have water flowing through them has been reduced to about 4.5 miles,

representing about 28 acres of open water. Vegetation supported in this habitat includes pondweeds (*Potamogeton* sp.), duckweed (*Lemna* sp.), *Elodea* sp., mare's tail (*Hippuris vulgaris*), yellow water-weed (*Jussiaea repens*), and water millfoil (*Myriophyllum* sp.). These species provide cover, food, and oxygen for the invertebrates (crayfish, clams, etc.), amphibian larvae, and juvenile fish that become prey items for the higher trophic levels including the giant garter snake, larger game and non-game fish, and migratory waterfowl. The interconnected waterways of the basin's water conveyance system (e.g., canals, ditches, and drains) are similar to natural open water habitats, and form an aquatic network with high biotic value. The waterways provide opportunities for food, cover, and short and long distance wildlife dispersal and migration.

Riparian Scrub-Shrub habitat in the Natomas Basin and on the project site is characterized by thickets of woody shrubs, seedlings, and saplings growing along the upland margins of canals, sloughs, and ditches. Within the Natomas Basin there are about 630 acres of scrub-shrub; there are about five acres (1%) on the Metro Air Park site. Periodic disturbances such as mowing, disking, burning and spraying have prevented young trees of various species -- valley oak (*Quercus lobata*), walnut (*Juglans californica* var. *hindsii*), cottonwood (*Populus fremonti*), maple (*Acer negundo*), and willow (*Salix gooddingii*) -- from maturing into a riparian woodland. The dominant shrubs of this habitat type include button willow (*Cephalanthus occidentalis*), blackberry (*Rubus ursinus*), arroyo willow (*Salix lasiolepis*), sandbar willow (*Salix hindsiana*), poison oak (*Toxicodendron diversilobum*), wild rose (*Rosa californica*), and elderberry (*Sambucus mexicana*).

The disturbance regime normally found in riparian scrub-shrub also facilitates an aggressive herbaceous component typically found in ruderal fields and non-native grasslands. Red brome (*Bromus rubens*), wild oat (*Avena fatua*), bermuda grass (*Cynodon dactylon*), ryegrass (*Lolium perenne*), wild mustard (*Brassica campestris*), star thistle (*Centaurea solstitialis*), horseweed (*Conyza canadensis*), fennel (*Foeniculum vulgare*), dock (*Rumex* sp.), knotweed (*Polygonum* sp.), and chicory (*Cichorium intybus*) intergrade with the more mesic understory of the riparian scrub-shrub; smartweed (*Polygonum amphibium*), sedge (*Carex barbarae*, *Carex* sp.), nutsedge (*Cyperus egrostris*), mugwort (*Artemisia douglasiana*) and creeping spikerush (*Eleocharis palustris*) also occur in this community.

Grassland-Ruderal vegetation in the Natomas Basin and on the project site is found on levee crowns and side slopes, terraces below the levees, along road shoulders, easements, powerline rights-of-way, and exists as the ground cover type for areas with less than 30 percent tree cover. There are roughly 2900 acres of grassland-ruderal vegetation within the Natomas Basin, of this about 90 acres (3%) are on the Metro Air Park site.

The most common grass species found in this habitat are wild oat (*Avena fatua*), slender wild oat (*Avena barbata*), rip gut brome (*Bromus diandrus*), brome (*Bromus madritensis* ssp. *rubens*), bermuda grass (*Cynodon dactylon*), dallis grass (*Paspalum dilatatum*), and ryegrass (*Lolium perenne*). The forb cover includes wild mustard (*Brassica campestris*), star thistle (*Centaurea solstitialis*), chicory (*Cichorium intybus*), horseweed (*Conyza canadensis*), fennel (*Foeniculum vulgare*), bur clover (*Medicago arabica*), plaintain (*Plantago major*), knotweed (*Polygonum* sp.), and dock (*Rumex* sp.).

Grasslands maintained by mowing or disking have low to moderate wildlife habitat value.

Common birds include the meadowlark, starling, mockingbird, scrub jay and shorteared owl. California voles, field mice and jackrabbits nest and forage in the grasslands, becoming prey for several raptors including American kestrel, Swainson's hawk, red-tailed hawk, black-shouldered kite, and burrowing owl.

2. Habitat Communities at Off-Site Improvement Sites

Approximately 123 acres of land would be affected by construction of off-site drainage, sewer, and roadway improvement needed for the MAP project. The locations of the off-site features are shown in Figure 4, which is a 1999 air photo of the MAP site and its vicinity. As evidenced in Figure 4, most of the off-site improvements are located on agricultural lands, which are/were in rice cultivation or other irrigated agricultural use. Some of the improvements to drainage facilities are located along existing drainage ditches which would be upsized.

Sewer Line, Proposed Alignment and Meister Way Widening: This alignment is roughly 15,000 feet in length (2.8 miles) from where it exits the MAP site and joins the I-5 trunk line. Approximately 1 mile of the line traverses through active rice fields (see Figure 4). It then would cross under I-99 where it would turn south and parallel I-99 and I-5, next to the road right-of-ways, to the existing trunk line connection. Agricultural fields parallel I-99 and I-5 along the length of the proposed sewer line. This line would impact approximately 12 acres of active rice fields and 22 acres of other "low crop" agricultural lands. These 34 acres could support habitat for the giant garter snake, Swainson's hawk, burrowing owl and loggerhead shrike.

Sewer Line, Alternative Alignment: The first segment of this line, from the MAP site to I-99 is the same as for the proposed alignment. Once the line crosses under I-99 it would extend roughly 1200 feet before it turned south, paralleling I-99/I-5 to the trunk line connection. This segment of the line traverses through agricultural fields that appeared to be fallow in the 1999 air photo (see Figure 4). The alternative line would roughly impact 12 acres of rice lands and 22 acres of other agricultural fallow rice or other low crop agriculture. These 34 acres could support habitat for the giant garter snake, Swainson's hawk, burrowing owl and loggerhead shrike.

New Elkhorn Extension. The 2-lane extension of Elkhorn Road to the airport would traverse through about 6,000 feet of agricultural fields that are located immediately south of the airport. The new road would remove 14 acres of active agricultural fields. These 14 acres could support habitat for the giant garter snake, Swainson's hawk, burrowing owl and loggerhead shrike.

South Bayou Road Improvements. This 2-lane road, which would be relocated south of the new I-5 interchange at Metro Air Parkway, would traverse through a rice field and other low crop agricultural field just to the west of the rice field (see Figure 4). Approximately 16 acres of the rice field would be lost as a result of these road improvements. These 16 acres could support habitat for the giant garter snake, Swainson's hawk, burrowing owl and loggerhead shrike.

Elkhorn Boulevard Widening from 2-lanes to 6-lanes. The north side of Elkhorn Blvd. between Lone Tree Road and Highway 99 is currently in rice production. The rice field would be reduced in size by as much as 7 acres. The south side comprises a non-agricultural land use that is disturbed by ongoing use of the site (see Figure 4). These 7 acres could support habitat for the giant garter snake, Swainson's hawk, burrowing owl and loggerhead shrike.

Elverta Road Widening from 2-lanes to 4-lanes. Both the north and south sides of Elverta Road between Lone Tree Road and Highway 99 are currently in rice production. As much as 9.7 acres of the rice field would be lost as a result of the road widening project. These 9.7 acres could support habitat for the giant garter snake, Swainson's hawk, burrowing owl and loggerhead shrike.

Powerline Road Improvements from I-5 to Del Paso Road. This ¾-mile section of Powerline Road is a narrow two-lane roadway running between active agricultural fields. There is a water canal located on the east side of the road until about ½ the way to Del Paso at which point the canal runs under to road to the west side. Several small trees grow in the canal. Road improvements would result in the loss of approximately 2 acres of agricultural land and the reconstruction of the existing water ditches/canals. These 2 acres could support habitat for the giant garter snake, Swainson's hawk, burrowing owl and loggerhead shrike.

Del Paso Road Improvements from Powerline to City Limits. This ¾-mile section of Del Paso Road is a narrow two-lane roadway running between active agricultural fields. There are water ditches/canals located both the north and south sides of the road. Several small and medium size trees grow along the roadway. Road improvements would result in the loss of approximately 2 acres of agricultural land and the reconstruction of the existing water ditches/canals. These 2 acres could support habitat for the giant garter snake, Swainson's hawk, burrowing owl and loggerhead shrike.

New/Upgraded Drainage Facilities. The new/upgraded drainage facilities needed to serve the Metro Air Park site are shown in Figure 4. In most cases the improvements will be made to existing culverts and canals so that they can accommodate greater volumes of water. Construction of these facilities would require use of 30 acres of existing canal and ditch habitat and adjacent low crop agricultural fields. These 30 acres could support habitat for the giant garter snake, Swainson's hawk, burrowing owl and loggerhead shrike.

B. Covered Animal Species

Fourteen listed species or species of concern have the potential to occur on the MAP site based on the following criteria: 1) habitat which is utilized by the species occurs on the site, 2) the MAP site is within the known range of the species, and 3) the MAP site is within the flyway of and contains suitable winter habitat for migrating waterfowl. Brief habitat descriptions of the covered species are included below. The MAP HCP covered species list is contained in Table 1.

To offset the potential impacts of incidental take and habitat loss on the 14 covered species, the MAP HCP requires participation in the regional minimization and mitigation program described in Chapter III. C. below. MAP's participation in the establishment of regional wetland and upland habitats for the giant garter snake and Swainson's hawk will provide significant levels of protection for the covered species listed in Table 1 because of the substantial habitat protection, mitigation and enhancement measures mandated by the HCP.

1. Giant Garter Snake

The state and federally-listed threatened giant garter snake is one of the largest garter snakes of the genus *Thamnophis*, with a total length up to 4.5 feet or greater. The snake in the

Sacramento Valley and Delta regions has a dorsal ground color often dark brown to olive or nearly black, a complete dorsal strip varying in color from dull yellow to bright orange, and often orange on the ventral surfaces as well (G. Hansen, 1991). The giant garter snake was formerly listed as a sub-species of *Thamnophis elegans* but has more recently been elevated to a full species status as *T. gigas* (Rossman and Stewart, 1987). Since *T. gigas* is adapted to a different ecological habitat than other subspecies of either *T. elegans* or *T. couchii*, *T. gigas* is largely isolated from its related species and sub-species.

The species occurs in a combination of permanent and temporary freshwater habitats throughout much of the Basin and elsewhere in the Central Valley of California. The species conducts most of its activities within the immediate vicinity of water. Giant garter snake usually occur within a few feet of water (diving distance) and are often found between the water level and the top of the bank. Habitat components could include slow-moving water, mud bottom, ditches, canals, flooded rice fields, sloughs, and low-gradient streams with vegetated banks. Holes in banks provide shelter.

The species adapts well to human-made waterways as long as they have the primary requirements of: 1) enough water during the active summer season to supply food and cover (minimum April - July; optimum March - October); 2) grassy banks for basking; 3) emergent vegetation for cover during the active season (March - October); and 4) high ground or uplands that provide cover and refuge from flood waters during the dormant season (October - March).

However, the USFWS does not consider canal and ditch habitat to be prime habitat for wetland species including the giant garter snake. The canals and ditches are often located adjacent to roadways that pose significant risks to giant garter snake that bask on the roadways. The canals and waterways in the Natomas Basin also undergo periodic maintenance that reduces their habitat value for the giant garter snake and other wetland species. Finally, because there is no assurance that agricultural use of the lands or the water supply to fill and maintain water in the canals and ditches will continue, there is major uncertainty regarding the long-term value of this habitat.

Hansen and Brode (1992), describe daily activity to generally include "1) emergence from burrows in the bank after sunrise; 2) basking to warm their bodies up to activity temperatures during cool weather or on cool early mornings, and 3) foraging or courting activity throughout the remainder of the day. Giant garter snake were observed several times after sunset during hot weather, usually lying motionless on warm pavement or dirt roads." Giant garter snake will move distances of over one mile, and were documented to move as much as ½ mile in a single day. Long stretches of unvegetated canals may be used as dispersal corridors for giant garter snake, however, they typically do not remain in unvegetated canals. Snakes occurring in unvegetated canals become easy prey for predators.

Giant garter snakes move around to find suitable habitat as conditions in the fields change. Connectivity of canal and ditch systems is important both for genetic health and ability to find summer habitat.

In the rice field network, excess water is drained from the fields by a network of drainage ditches that are often routed next to the irrigation canals and are separated from them by narrow berms or roadways. All three components (irrigation ditch, field, drainage ditch) are used by

giant garter snakes. Rice fields in or next to historic flood basins appear to have the most giant garter snakes.

The species specializes in aquatic prey, including small fish and frogs, carp, mosquitofish, bullfrogs, and treefrogs.

Results of 1998-2000 Investigations of Giant Garter Snakes in the Natomas Basin

Glenn Wylie and Michael Casazza of the Dixon Field Station of the U.S. Geological Survey, Biological Resources Division, conducted surveys of the GGS in the Natomas Basin in 1998 and 1999 under a cooperative agreement with the U.S. Fish and Wildlife Service. The results of the investigation are summarized below.

The authors note that the survey was limited in geographic scope due to restricted access to private lands. By inspection of Figure 1 in the report, the survey covered the main canals in the Sacramento County portion of the basin fairly thoroughly, and covered the interior of a much smaller area. The MAP site was included in both trap and transect locations. During the two years of the survey, there was no rice cultivation on the MAP property. Most of the survey results for rice farms comes from the Elverta study site one mile northeast of the MAP site.

During the two year period, a total of 277 individual giant garter snake were caught (104 in 1998 and 173 in 1999). About 25% of the individuals were recaptured. Given the distribution of the snake captures within the Basin, the authors conclude that giant garter snakes probably exist throughout the Basin where suitable habitat is available. Although giant garter snakes are relatively abundant in some areas of the Natomas Basin, their habitat has apparently degraded with time and the quality of the habitat is less than at other geographic locations in which the snakes have been found (Wylie 1996, 1997).

Wylie and Casazza found that female snakes grew larger in length and weighed more than male snakes. More females were caught than males, most likely due to the females greater size which made them more visible and vulnerable to capture. Unbiased passive sampling with traps from the 1998-1999 study, as well as from other studies, indicates the true sex ratio for giant garter snakes to be 1:1. With more extensive use of trapping during 1999, greater numbers of smaller snakes were caught, reducing concerns about recruitment into the population in the Natomas Basin. Using categories of mass as surrogates for age classes, giant garter snakes in the Natomas Basin appear to have a reasonably healthy population age structure. Estimates of linear densities of giant garter snakes ranged from 8-52 per kilometer for the four trap lines where there were sufficient densities to make estimates.

At the Elverta site (principally the area north of Elverta Road and west of Highway 99) in the spring, 80-90% of radio-marked snakes observed were in ditches with the remainder in rice fields. Snakes began to use rice fields shortly after vegetation emerged in late spring. In the summer, when rice fields were established as emergent habitat, snakes used them in approximately half of the observations; they used ditches in the other half of the observations. When snakes were in rice fields they primarily used the edges of the field perimeter or along the check dikes. Rice fields were used until early October when they were completely dewatered. Giant garter snakes then used ditches that retained water the longest after rice harvest and overwintered in burrows high in the ditch banks.

Habitats used by radio-marked snakes at the Fisherman's Lake site was dominated by the Fisherman's Lake slough channel itself with use of adjacent rice fields making up the most of the remaining summer observations. Irrigation canals branching off from the slough were seldom used. Again, snakes used the edges of the slough habitat near the banks. They also overwintered in burrows in the ditch banks.

For the 1998-2000 studies conducted by Wylie and Casazza, home range estimates for radio-marked snakes ranged from 13 to 87 hectares with a median of 35 hectares with no apparent difference between the Elverta and Fisherman's Lake sites. The telemetry studies of giant garter snakes conducted at Fisherman's lake failed to show any movement of snakes out of the Fisherman's Lake area. Glenn Wylie believes that existing presence of Interstate 5 may already extremely limit movement of snakes from Fisherman's Lake to areas north of I-5. Studies conducted by George Hansen and John Brode in 1992 identified three separate areas within the American Basin that had GGS: the Fisherman's Lake area, the area east of 99 by Elverta (Snake Alley), and the Prichards Lake area north of I-5. The report identified highways as major obstacles to GGS movement between the three populations.

A significant number of giant garter snakes were found in rice fields and ditches near the Sacramento Airport, including several within ditches inside and bordering the Metro Air Park site. Although giant garter snakes primarily used the edges of rice fields, the overall importance of rice fields to giant garter snakes in the Natomas Basin should not be underestimated. Rice fields likely function to produce populations of food organisms to sustain snake populations and could be vital nursery areas for young snakes. Emergent rice fields are also refuges for snakes when ditches are drained or are denuded by weed control. Data are reported for four transects: two in MAP and two in the Elverta site. At MAP, the density (and 95% confidence limits) expressed as snakes per km of transect was 32 (26 - 49) and 8 (6 - 12); at Elverta the density was 52 (39 - 97) and 43 (35 - 63). The density difference between the sites is statistically significant, but the survey confirms that the MAP site is habitat for the giant garter snake and is probably similar in quality to most of the Basin.

Regardless of the habitat value of individual rice fields, the combined effects of rice agriculture on the landscape and of keeping water in ditches, canals and sloughs (which in turn become linear marshes), is important in providing habitat for giant garter snakes. The authors conclude that "a blend of permanent marshes and appropriately managed rice fields would be the most practical approach to maintaining giant garter snake numbers in the Natomas Basin" (Wylie and Casazza, 2000).

Wylie and Casazza (with Martin and Hanson) also conducted surveys of giant garter snakes in the Natomas Basin from June through September 2000 (Wylie and Casazza, December 2000). They captured 48 female and 33 male giant garter snakes for a total of 81 individuals. Giant garter snakes were found in ditches with vegetative cover. Young of the year were only found in ditches that were heavily vegetated.

The surveys also showed that two of the NBC reserve land holdings (southern Bennett and southern Lucich properties) have reasonably high GGS densities.

Site reconnaissance of March 23, 2000

A biological site reconnaissance was conducted at the MAP site on March 23, 2000. Most of the agricultural land on the site was fallow. Some of the canals and ditches had water and some were dry. The 2000 reconnaissance confirmed the earlier biological assessment (Final EIR 1993) that the site contains GGS habitat. One live giant garter snake was observed basking on the asphalt of Powerline Road near I-5. A water-filled ditch with tules was located next to the roadway where the snake was observed basking. Appendix D of the MAP EIS contains the letter report of the survey results.

A brief survey of the site in May 2001 also found most of the project site in a fallow condition with many fields choked with a cover of tall, nearly impenetrable weeds.

2. Swainson's Hawk

The State-listed threatened Swainson's hawk (*Buteo swainsoni*) is a medium sized buteo (25 - 35 ounces) and is distinguished from other buteos by long, narrow, pointed wings; their plumage varies greatly. Light phase birds have buff white wing linings with darkly barred brown flight feathers; dark phase birds are dark brown with white undertail coverts, and intermediate reddish plumage occurs between phases.

The Swainson's hawk inhabits grassland plains and agricultural regions of western North America during the breeding season and winters in grassland and agricultural regions extending from Central Mexico to southern South America (in Estep 1999).

Swainson's hawks begin to arrive in the Central Valley from South America in March to breed and raise their young. Territories are established by April with incubation and brooding occurring through June. The earliest fledging occurs in July with the young remaining with the parents until the southern migration in early fall.

Estep 1999 reports that California "currently supports between 500 and 1,000 breeding pairs of Swainson's hawk, which represents less than 10% of the historic population. The Central Valley population (between 400 and 900 breeding pairs) extends from Tehama County southward to Tulare and Kings County and is isolated from the rest of the species' range."

Swainson's hawks are opportunistic foragers, flushing prey (birds, rodents and some insects) from fields, pastures and grasslands adjacent to their nests. Males provision the females while they incubate eggs; later both parents feed the young.

Swainson's hawks require large nesting trees, 40 - 60 feet, with a panoramic view of their foraging grounds. The foraging habitats, open fields and grasslands, need to be within flying distance (maximum 18 miles) and large enough to support the high densities of microtine rodent populations and birds upon which they feed. Their nesting preference is for large valley oaks (*Quercus lobata*), cottonwoods (*Populus fremontii*), or willows (*Salix goodingii*) within one mile of riparian areas.

The minimum area required for foraging depends upon the vegetation supporting the prey populations and the farming activities that make prey particularly susceptible to predation, such as reduction of cover after harvesting, disking, mowing, flood irrigation and burning. Swainson's

hawks highly active foraging behavior often results in birds traveling as far as 18 miles from a nesting site (Estep, 1989). Swainson's hawks have been observed foraging behind farm machinery (moving harvester blade or disc), capturing rodents that have become exposed from ground disturbance (Estep, 1989). Foraging ranges in fields with increased vegetation cover and reduced prey availability can be as large as 15,000 acres (Koford, 1992).

Suitable cover types for foraging habitats, in order of suitability, include native grassland, agriculture soon after discing, alfalfa and other hay crops, fallow fields, lightly grazed pasture, combinations of hay, grain, and row crops, rice fields prior to flooding and after draining, and heavily grazed pasture.

Unsuitable cover types for foraging habitats include vineyards, mature orchards, flooded rice fields, cotton, thistle in fallow fields and any crop where prey are unavailable due to high vegetation height and density.

In the Natomas Basin, Swainson's hawks nest anywhere suitable nest trees are found. Surveys conducted in 1998 by the Swainson's Hawk Technical Advisory Committee (SHTAC) found Swainson's nesting in areas along the Sacramento River and along roadway and canal corridors (SHTAC, 1998). They forage throughout the Natomas Basin on either fallow agricultural land, or on land where certain row crops have been harvested. Foraging habitat in the Basin probably ranges from about 5,000 acres to up to 20,000 depending on crop type (NBHCP, 1997).

In 1999 Jim Estep of the SHTAC conducted a survey for nesting Swainson's hawks in the Natomas Basin Habitat Conservation Plan area for the Natomas Basin Conservancy. The Metro Air Park project site was part of the survey area.

According to the Estep 1999 report "a total of 15 active nest sites were found within the Natomas Basin during 1999 surveys. This does not include the Sacramento River, which was not surveyed; but does include the Cross Canal, which is technically outside of the NBHCP area."

"The Sacramento River is surveyed periodically by DFG, and nesting data along the portion that borders the NBHCP area indicates a relatively large and stable nesting population. Sacramento River breeding pairs use the Basin for foraging, and some could be dependent on the foraging habitat within the Basin to successfully breed each year."

The 1999 Estep survey found one Swainson's nest tree on the extreme southern end of the Metro Air Park project site. According to the report "Site NB-7 is an active, successful nest located approximately 0.25 mile northeast of the Interstate 5 and Powerline Road intersection. The nest is in a 25-foot tall willow tree, the southern most of three isolated willow trees. The surrounding area consists primarily of row and grain crop agriculture, providing relatively high value foraging habitat for Swainson's hawks." Site NB-7 was also successfully used in 2000 (Swainson's Hawk Technical Advisory Committee, Sept. 2000). Two new active nesting locations just southwest of the MAP site were noted in the SHTAC 2000 Annual Report (numbers NB-19 and 20).

A biological site reconnaissance was conducted at the Metro Air Park site on March 23, 2000. Most of the agricultural land on the site was fallow (1700 acres) which provides foraging

habitat for Swainson's hawk. One Swainson's hawk was observed soaring overhead near the south end of the site (Powerline Road and I-5). A brief survey of the site in May 2001 also found most of the project site in a fallow condition with many fields choked with a cover of tall, nearly impenetrable, weeds that are unsuitable as Swainson's hawk foraging habitat. One Swainson's hawk was observed perched on a willow tree near the south end of the site by Powerline Road and I-5. According to Jim Estep, a pair of Swainson's hawks were again nesting on the MAP site in 2001. Although the nest previously identified as NB-7 had blown down during the winter of 2000-2001, the hawks built a new nest on a nearby willow tree and initiated nesting there.

For additional information on the life history of the Swainson's hawk refer to the November 1994 CDFG Draft Mitigation Guidelines for Swainson's Hawk.

3. Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB) is a federally listed threatened species. The VELB is a cerambycid beetle in the order Coleoptera. The VELB's range consists of California's Central Valley where elderberry is a common component of remaining riparian forests and adjacent upland habitats. The male VELB has a dark pattern of the elytra reduced to four oblong spots, and the basal segments of the antennae are usually covered with pale hairs (Barr, 1991). The beetle is totally dependent on elderberry shrubs, using both *Sambucus mexicana* and *S. caerulea*. The beetle has a one-to two-year life cycle. Adults lay their eggs on elderberry bushes. The emerging larvae bore into and feed upon the stems of the plant. The beetle emerges as an adult during the flowering period of the plant, typically from late-March through mid-June. The adults disperse, feed upon elderberry foliage and flowers, reproduce, and die.

The range of the VELB extends throughout California's Central Valley and associated foothills from about the 3,000-foot elevation contour on the east and the watershed of the Central Valley on the west and includes 31 counties including Sacramento and Sutter Counties. Elderberry bushes are a component of the riparian scrub-shrub plant community. Within the Natomas Basin, the riparian scrub-shrub community comprises approximately 630 acres. There are several CNDDDB documented occurrences of the VELB along the Sacramento River on the eastern and southern edge of the Natomas Basin. No elderberry bushes are known or suspected to occur on the Metro Air Park project site.

4. Tricolored Blackbird

The tricolored blackbird (*Agelaius tricolor*) is a State species of special concern. The male tricolored blackbird has red shoulder patches broadly tipped with white. The female, which has sooty-brown plumage, shows varying amounts of red on its shoulders. The species forages in grasslands, wetlands, rice fields, croplands, and weedy uplands dominated by mustards and thistles, etc. It breeds between April and July. Preferred nesting sites are in marshes containing heavy growth of bulrushes, cattails, and blackberries. This bird ranges throughout North America. Within California it is primarily found throughout the Central Valley and in coastal districts from Sonoma County south. Wintering populations have historically concentrated around the counties of the Delta confluence of the Sacramento and San Joaquin Rivers, and the San Francisco Bay area south to San Luis Obispo County and north into Napa and Sonoma Counties.

According to a species account contained within the Draft Recovery Plan for the Giant Garter Snake (GGS DRP), a survey in late April of 1997, reported by Beedy and Hamilton, found roughly 230,000 breeding tricolored blackbirds in California. A follow up survey conducted in 1999 found fewer than 95,000 breeding individuals. None of the survey sites where breeding was recorded in 1999 were located in the Natomas Basin (Hamilton, Cook, and Hunting, 1999).

The preferred habitats for tricolored blackbird, emergent marsh and riparian shrub-scrub, are very limited in the Basin, with only 1400 acres within the 55,000 Basin (NBHCP, 1997). Only five acres of scrub-shrub is present on the MAP site.

The tricolored blackbird is occasionally observed within the Natomas Basin and was observed foraging on the MAP site during field reconnaissance for the 1993 EIR.

In June 2000, Richard DeHaven, a Fish and Wildlife Service Biologist, published a paper titled "Breeding Tricolored Blackbirds in the Central Valley, California: A Quarter-Century Perspective". Mr. DeHaven's study found there has been a large population decline between the 1970's and now and that much of the remaining breeding population is associated with large dairy operations in the San Joaquin Valley. Unfortunately silage harvest at the dairies has had an impact on breeding blackbirds. The report concludes that hope for the tricolored blackbird will be through a) potentially large increments of reproductive output-if the silage harvesting problem can soon be resolved, and (b) possible long-term stabilization of existing, high-value tricolor habitat associated with large dairies.

One of the blackbird populations visited by Mr. DeHaven's during his surveys was at the Natomas Basin Conservancy Betts Tract mitigation property located in southwestern Sutter County, within the Natomas Basin. Mr. DeHaven found that the Natomas colony contained an estimated 4,000 tricolors nesting in five scattered clumps of blackberry. Nesting was synchronous with the birds singing, displaying, and just beginning to construct nests. Prior year's nests were present substantiating its prior usage. It was Mr. DeHaven's opinion that the colony being managed by the NBC was a "showcase example of high-quality tricolor breeding habitat".

5. Aleutian Canada Goose

The Aleutian Canada goose (*Branta canadensis leucopareia*) formerly a federally-listed threatened species, was delisted as its populations have increased in response to various conservation measures (Federal Register, Vol. 66, No. 54, March 20, 2001). The Aleutian Canada goose, which range includes most of North America, is a common migrant and a common to abundant winter resident throughout the Central Valley, Salton Sea, and northeastern areas of California. Locally, it winters in the Butte Sink in the Sacramento Valley and in northern San Joaquin Valley grasslands (GGS DRP). The goose prefers lacustrine, fresh emergent wetlands, and moist grasslands, croplands, pastures, and meadows. The Central Valley is apparently an important wintering ground of the Aleutian Canada goose. In California this species feeds primarily on green shoots and seeds of cultivated grains and wild grasses and forbs. This bird nests in the Aleutian Islands of Alaska.

The Aleutian Canada goose winters in areas both north and south of the Natomas Basin and is an occasional winter visitor in the Basin and to the Metro Air Park project site. Approximately 20,000 acres of suitable winter habitat exists in the Natomas Basin. Prior to 1998, when rice was grown on the Metro Air Park site, there were as much as 1,000 acres of suitable winter goose habitat.

6. White-faced Ibis

The white-faced ibis (*Plegadis chihi*), which ranges throughout the Western United States, is a state and federal species of concern. It is a rare migratory visitor in the Central Valley. It was formerly more common in the San Joaquin Valley, but no longer breeds regularly anywhere in California. The white-faced ibis prefers to feed in fresh emergent wetland, shallow lacustrine waters, and muddy ground of wet meadows and irrigated, or flooded, pastures and croplands. In Yolo, Sacramento, and Colusa Counties, rice appears to be the preferred foraging habitat where ibis feed on crayfish (GGS DRP). It typically nests in dense, fresh emergent wetland. The species has declined in California probably as a result of loss of extensive marshes that are required for nesting.

According to the species account contained in the GGS DRP, key areas of wintering white-faced ibis in California's Central Valley based on 1990 to 1996 records were: Delevan-Colusa Butter Sink Area, northwestern Yuba County, the Yolo Bypass, Grasslands Wetlands Complex, and Mendota Wildlife Area. Nesting and wintering white-faced ibis concentrate locally in large numbers and also occur in lesser numbers over a wide area of its range.

In the Sacramento Valley, wintering ibis were rare in the 1970's with the highest counts of 11 birds in 1978 and 1979. In 1996, Hickey and Shuford, estimated that a minimum of 10,000 to 11,000 ibis were in the Sacramento Valley.

The white-faced ibis is a rare visitor to the Natomas Basin and has not been observed on the Metro Air Park project site. Approximately 20,000 acres of suitable winter habitat exists in the Natomas Basin for the ibis. Prior to 1998, when rice was grown on the Metro Air Park site, there were as much as 1,000 acres of suitable winter ibis habitat.

7. American Peregrine Falcon

The American peregrine falcon (*Falco peregrinus anatum*) was a Federally listed endangered species, but was delisted in 1999 due to recovery efforts (Federal Register, Volume 64, No 164, Wednesday August 25, 1999). It remains a state listed species and a state designated fully-protected species. This species of crow-size falcon has a dark cap on the head that extends down each cheek. The bird's range includes all of North America and it can be found in most areas of California (except deserts) during migrations and in the winter. The bird typically nests on ledges of large cliff faces, but may also use tall buildings and bridges. Nesting and wintering habitat are varied and include: wetlands, woodlands, other forested habitat, cities, agricultural lands, and coastal areas.

The peregrine falcon winters in the Sacramento Valley and can occasionally be found in the Natomas Basin and possibly on or around the Metro Air Park project site. Most areas of the Natomas Basin and the Metro Air Park site could be considered suitable foraging habitat for the

Peregrine falcon, but no nesting habitat is present.

8. Loggerhead Shrike

The range of the loggerhead shrike (*Lanius ludovicianus*), a state and federal species of concern, comprises most of the United States and portions of southern Canada. It is a common resident and winter visitor in foothills and lowlands throughout California. It occurs rarely in urbanized areas, but uses open cropland. It prefers open habitats with scattered shrubs, trees, fences, posts, or other perches. It can be found in the open areas of the following habitats: valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree. The shrike nests in densely foliated shrubs or trees.

The loggerhead shrike is fairly common in the Pacific States and is regularly observed throughout the Natomas Basin most of which comprises suitable habitat for this species. Several loggerhead shrikes were observed on and near the Metro Air Park project site during a site reconnaissance conducted on March 23, 2000. Most of the MAP site comprises suitable habitat for the shrike.

9. Greater Sandhill Crane

The greater sandhill crane (*Grus canadensis tabida*) is a state-listed threatened species and is a state designated fully protected species. Its range includes most of western and central North America. Within California, the summer range of this species is restricted to the northeastern corner of the state (Siskiyou, Modoc and Lassen Counties). In the winter the crane occurs in and near wet meadow, shallow lacustrine, and fresh emergent wetland habitat in the Sacramento and San Joaquin valleys from Tehama County south to Kings County. It frequents annual and perennial grassland habitats, moist croplands with rice or corn stubble and open emergent wetlands. This species is particularly sensitive to human disturbance when nesting.

Sandhill cranes do not currently inhabit the Natomas Basin, nearby wintering grounds include the Sacramento-San Joaquin Delta and the Consumnes River area to the south and the Butte Sink area to the north. It is possible that cranes could use areas of the Natomas Basin in the future. Approximately 20,000 acres of suitable winter habitat exists in the Natomas Basin for the Sandhill Crane. Prior to 1998, when rice was grown on the Metro Air Park site, there were as much as 1,000 acres of suitable sandhill crane habitat.

10. Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a state species of special concern. The range of the burrowing owl comprises the western United States. It is a year long resident of open, dry grassland and desert habitats throughout the California deserts, Central Valley, and coastal areas. It is also found in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. The burrowing owl uses rodent or other burrows for roosting and nesting cover. Agricultural and urban conversion, along with ground squirrel poisoning programs, have contributed to the decline of this species. The CDFG's mitigation guidelines for burrowing owls are contained in Appendix E of the NBHCP.

The burrowing owl is found throughout the western United States and in many areas of California. It has both summer and winter range in the Central and San Joaquin Valleys, along the north coast and in the desert region of California. It occurs in the Natomas Basin and on the project site. One burrowing owl was observed near its burrow on the Metro Air Park project site during a site reconnaissance conducted on March 23, 2000. The burrow was located just off of Powerline Road between Elverta and Elkhorn Boulevard at the top of a canal/ditch bank.

The Natomas Basin has about 140 miles of canals and ditches and associated adjacent agricultural fields that are potentially suitable burrowing owl habitat. There are 12 miles of canal and ditch habitat on the MAP site along with 1700 acres of agricultural fields. Due to the frequently changing conditions of the crop fields, occupied owl burrows are likely to be restricted to the canal and ditch banks that are mostly left undisturbed, except when bank stabilization is needed. The adjacent agricultural fields provide foraging habitat for the owls.

11. Bank Swallow

The bank swallow (*Riparia riparia*), a state-listed threatened species, is found throughout most of North America. It has a distinct brownish-grey breast band that contrasts with its clean white underparts. Bank swallows nest in colonies composed of burrows excavated from the steep sides of riverbanks or similar areas. Foraging habitat generally consists of open water, croplands, and grasslands adjacent to breeding colonies. Bank swallows breed in northern California from April through early August. The majority of bank swallows remaining in California nest along the Sacramento River representing up to 70% of the statewide population.

Suitable foraging habitat for the bank swallow is primarily found near the Sacramento River close to breeding colonies. Metro Air Park's distance from the nesting colonies on the Sacramento River make it marginally suitable for use by the bank swallow.

No bank swallow nesting colonies are recorded in the Natomas Basin, but the species does nest nearby along the Sacramento and Feather Rivers and may occur in the Natomas Basin in the future. There is no current nesting habitat for the bank swallow on the project site.

12. Northwestern Pond Turtle

The range of the northwestern pond turtle (*Clemmys marmorata marmorata*), a state and federal species of concern, comprises the western United States west of the Sierra-Cascade crest. It is uncommon to common in suitable aquatic habitat throughout California. It is associated with permanent or nearly permanent water in a wide variety of habitats. Habitat requirements include slack or slow-moving water, upland sites for nesting, and basking sites such as partially submerged logs, rocks, mats of floating vegetation, and open mud banks. Pond turtles lay their eggs on land and may leave the water to aestivate or to overwinter. This turtle is omnivorous and feeds on aquatic plant material, beetles, a variety of aquatic invertebrates, fishes, and frogs.

Fisherman's Lake, one mile south of the MAP site, is good habitat for western pond turtle and the animal is found in canals and waterways in the Natomas Basin. The western pond turtle has not been observed on the MAP site, but could occur within the canals and ditches on the Metro Air Park site. There are 140 miles of canals and ditches in the Basin and about 12 miles within the MAP site.

C. Covered Plant Species

1. Delta Tule Pea

The Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), a federal species of concern, is a perennial herb that occurs in both freshwater and brackish water marshes and swamps in the Central and San Joaquin Valleys and in the Bay Area. It has been recorded in Alameda, Contra Costa, Fresno, Marin, Napa, Sacramento, San Benito, Santa Clara, San Joaquin, and Solano Counties. It is currently threatened by agriculture, water diversion projects, marsh drainage, levee work, and recreation. The Delta tule pea is currently not known to occur in the Natomas Basin but could be discovered or become established in the future. The 140 miles of canal and ditch habitat in the Natomas Basin, including the 12 miles within the MAP site, are marginal habitat for the Delta tule pea.

2. Sanford's Arrowhead

Sanford's arrowhead (*Sagittaria sanfordii*), a federal species of concern, is a perennial herb in the water-plantain family. It is associated with marshes and shallow freshwater habitats in elevations of usually less than 900 feet. The species is currently known from Butte, Del Norte, Fresno, Kern, Merced, Marin, Sacramento, Shasta, San Joaquin, and Tehama Counties. In 1980, 36 historic populations in the Central Valley were examined to determine their status. Only five extant populations were found. The Sanford's arrowhead is threatened by grazing, development, and channel alteration and has almost been extirpated from the Central Valley. Sanford's arrowhead is currently not known to occur in the Natomas Basin but could be discovered or become established in the future. There is very little naturally occurring marsh in the Basin at present. The 140 mile irrigation and drainage system may be are marginal habitat for Sanford's Arrowhead and this would include some of the 12 miles of ditches within the MAP site.

D. Take Levels/Impacts on Covered Species

This section describes the projected take of covered species under the MAP HCP. The action that will result from issuance of the permits is the foreseeable urbanization of the project site. The environmental effects of this action have been considered under the California Environmental Quality Act (CEQA) in an Environmental Impact Report prepared in 1993 by the County of Sacramento.

U.S. Fish and Wildlife Service action on the Section 10(a)(1)(B) permit application for the City of Sacramento was subject to NEPA compliance and was the subject of an Environmental Assessment, dated December 1997. An EIS has been prepared for the MAP HCP.

1. Effects on Covered Wildlife Species

Urban development expected to take place under the MAP HCP will result in the direct loss of known occupied habitat for the giant garter snake, Swainson's hawk, the burrowing owl, and loggerhead shrike. Since these habitats are or may be occupied by numerous additional covered wildlife species (see Table 1), these species may also experience habitat loss under the

Plan. It is also expected that individual animals of these species will or may be taken during urban development as well as other activities addressed in the MAP HCP. This could occur in many ways — e.g., immediate death or injury through crushing, either inside burrows or on the ground surface; road kill; abandonment or loss of young birds at nest sites or nest colonies as a result of disturbance or nest site destruction; starvation or exposure on construction sites as a result of displacement and disorientation.

Indirect death or injury from urban development may also occur. For example, some animals may flee a construction site and reach alternate habitat, but then perish from competition or reproductive exclusion if the habitat reached by refugees is already at carrying capacity. Alternatively, animals already inhabiting such habitat may perish as a result of the same increased competition. Other mortality factors that may come into play as a result of urban development are road kills and predation by domestic pets. For example, giant garter snakes are susceptible to road kills, thus, increased traffic on the Metro Air Park site as a result of development may increase this mortality factor for snakes as well as other wildlife in areas near or adjacent to development. Also, human population increases associated with development will likely increase pet populations, which, in turn, may increase wildlife mortality in some areas as a result of predation by dogs and cats.

2. Extent of Incidental Take

The MAP HCP area is known to be occupied or visited by five covered species: giant garter snake, Swainson's hawk, burrowing owl, tricolored blackbird, and loggerhead shrike. The 1993 and 1997 Final Environmental Impact Reports (FEIRs) for the Metro Air Park project provides specific information on the biological resources present on the project site. Field work for the 1993 EIR analysis was conducted in 1991 and 1992. At that time the site supported the giant garter snake, and Swainson's hawk, tricolored blackbird, and loggerhead shrikes were observed on or near the site. In March 2000 a new survey was conducted on the project site. At the time of the survey, most of the property was in fallow agriculture. During the survey, a Swainson's hawk was observed flying overhead, a burrowing owl was observed flying around its burrow on a canal bank, and a giant garter snake was observed basking on an asphalt road located next to the project site and loggerhead shrikes were observed. A brief survey of the site in May 2001 also found most of the project site in a fallow condition with many fields choked with a cover of tall, nearly impenetrable weeds.

Nine other covered species have not been confirmed to occupy or visit the permit area or its vicinity. These species are known from the larger Natomas Basin area or the Sacramento Valley.

The following text describes the impact on each of the covered species. The low estimate of direct take reflects the probable effectiveness of take minimization measures incorporated in the HCP. Indirect effects are based on the progressive loss of habitat and the nature of cumulative take from urbanization on this site and elsewhere in the Natomas Basin. Indirect effects usually cannot be expressed in quantitative terms as a number of individual animals, rather indirect effects are best interpreted as the extent of habitat lost or degraded by the covered activity.

Giant Garter Snake. Destruction of giant garter snake habitat by urban construction at the

MAP site would occur as the existing canals, drainage ditches and agricultural fields are phased-out of use and graded for development.

Although the ditches and drains currently used to bring water to the on-site agricultural lands will be eliminated as a result of project construction, both the Natomas Central Mutual Water Company (NCMWC) and Reclamation District 1000 (RD1000) must maintain existing water and drainage facilities to service other agricultural fields in the site vicinity including those at the airport, and on the north, east and south sides of the site. This Basin-wide system of canals and ditches will continue to provide habitat corridors for the giant garter snake as long as the agricultural water system in the Basin remains intact (see Figure 6). In particular, the MAP project will not affect the Lone Tree canal (canal along the eastern boundary of the MAP site), canals/ditches that serve the airport agricultural uses, or the canal that runs along Highway 99.

Normal rice farming activities can result in harm to giant garter snakes that are known to use rice fields. If rice farming were to resume in the future on the Metro Air Park site, take could occur from crushing by farm equipment, use of pesticides to control weeds and insect pests, and inadequate vegetation cover which may increase predation on garter snakes. Take from rice farming covered under the HCP would be minimized through the implementation of Wildlife Agency approved best management practices.

Wildlife agency requirements for pre-construction surveys and take avoidance and minimization measures would reduce the direct take of giant garter snakes during project construction. These measures are listed in Chapter 4. The MAP measures are adaptations of measures that have been used for this species since the early 1990's. Agency biologists believe the measures to be effective: construction is prohibited during the winter inactive season, giving animals the greatest opportunity to escape from disturbed areas, and animals are excluded from aquatic habitat by draining and diverted to other aquatic habitat, thus substantially minimizing take. Young are born "live", and there are no nests or non-mobile life stages.

Conversion of fallow agricultural fields and drainage ditches to urban uses would result in the loss of between 28 and 76 acres of the giant garter snake habitat associated with the canals and drainage ditches. The Draft Recovery Plan (US FWS 1999) describes possible indirect and cumulative effects that are summarized below.

The introduction of urban uses could result in the degradation of nearby giant garter snake habitat though the activities associated with urban development, such as flood control, weed abatement, rodent control, and storm water runoff. Giant garter snakes may be subject to harassment resulting from increased levels of human presence and vehicle use; they may be displaced into adjacent unsuitable habitat resulting in increased predation, exposure, or stress through disorientation and loss of shelter.

Habitat alterations that result in loss of cover and lower densities of prey items may increase the vulnerability of giant garter snakes to avian and mammalian predators, and may also increase the giant garter snakes vulnerability to predation. The urban development could also fragment giant garter snake habitat and reduce or eliminate dispersal opportunities between remaining habitat patches, potentially leading to population isolation. There may be increased potential for the spread of bullfrogs, predatory game fish and other exotic pests that could prey on young giant garter snakes.

The development within MAP, and in the City of Sacramento under the Natomas Basin HCP, is concentrated in one part of the Basin and the mitigation lands for giant garter snakes are intended to be in large, buffered blocks of habitat appropriately distributed in the basin. The Basin-wide program is intended to minimize the long-term, cumulative and indirect impacts.

Swainson's Hawk. The Swainson's hawk (*Buteo swainsoni*) is a state-listed threatened species under the California Endangered Species Act (CESA) (Fish & Game Code Sections 2050 et seq.). The species is not federally-listed.

One active/successful nest site for Swainson's hawk would be impacted as a result of project development. A nest in of one willow tree was used in 1999 and 2000, however, that nest blew down in the winter of 2001. A different, but nearby, willow tree was used in 2001. No other trees have been observed to be used for nesting on the MAP site, although several potential nest trees were identified in the Spring 2000 survey. Swainson's hawk exhibit nest tree fidelity (use the same nest trees year after year), they are considered opportunistic and will readily move to new nest sites when previously used trees are no longer available.

The project would result in the loss of between 600 to 1700 acres potential foraging habitat identified on the project site that would be converted to urban uses. The amount of foraging habitat lost will ultimately depend upon the current agricultural use of the land at the time of the conversion. Present trends indicate that most of the agricultural fields will be non-productive or in a dry land product such as cotton or safflower. If the fallow/dryland farming trend continues, foraging habitat for Swainson's hawk would be reduced or eliminated as the fallow fields fill with thick mats of weedy plant species such as thistles, wild radish and mustard. Destruction of potential Swainson's hawk foraging habitat by urban construction at the MAP site would occur as fallow and row crop agricultural fields are phased out of use and graded for development.

Nesting hawks benefit from having foraging habitat near a nest tree (Baumgartner, 2000). The loss of between 600 to 1700 acres of potential foraging could result in the ultimate abandonment of one or more active/successful nest trees. One or more pairs of hawks would have to find other suitable nest trees that are located near appropriate foraging habitat. Except along the Sacramento River, nest trees in the Basin are limited.

The 2000 Swainson's Hawk Technical Advisory Committee Report identified two nests (one active/successful and one active/unsuccessful) located in cottonwood trees growing in irrigation ditches west of Powerline Road. Off-site infrastructure improvements for the MAP project are shown at the Powerline Road/Del Paso Road intersection. This project involves replacing and upgrading the existing culverts at that intersection and would not impact Swainson's nest tree #19, which is not located at the intersection of the two roads. The other nest (#20) is located in a cottonwood tree growing in an irrigation channel 0.5 miles west of Powerline Road and 0.5 miles south of I-5. The off-site infrastructure improvement for the MAP project identified as "Airport/NCMWD Irrigation Pump" would not affect nest tree #20 as the tree is not located in the area where the improvements would occur. In the future should nesting occur in any tree that would be impacted by infrastructure improvements, implementation of the HCP's minimization and mitigation measures (see III.C.1b and III.C.2c), including pre-construction surveys, buffers and seasonal restrictions, will minimize and mitigate any indirect

impacts to both off-site nests prior to and during construction of the MAP project.

Burrowing Owl. Burrowing owls are found on and around the agricultural fields in the Natomas Basin and on the MAP site. A burrowing owl was observed outside its burrow on a canal bank on the MAP site in March 2000. There are 76 acres of canal and ditch habitat on the MAP site along with 1700 acres of agricultural fields. Due to the frequently changing conditions of the crop fields, occupied owl burrows are likely to be restricted to the canal and ditch banks which are mostly left undisturbed, except where bank stabilization is needed. The adjacent agricultural fields provide foraging habitat for the owls. The suitability of the foraging habitat for owls depends upon specific agricultural uses and probably varies from year to year.

The MAP project will not likely result in direct take of individual burrowing owls as the birds are very mobile and most of the time can escape direct harm. To insure that this is the case, the project is required to conduct pre-construction surveys and implement the wildlife agency take avoidance and minimization measures described in Section III. C. Take avoidance measures for burrowing owls, such as restriction of any construction activities during the nesting season, and use of passive relocation techniques, have been routinely used and are considered an effective means to avoid direct take of animals. Animals that flee the project site would have to find suitable habitat elsewhere in the project vicinity.

Tricolored Blackbird. The tricolored blackbird has been observed infrequently on the MAP site. The site does not support nesting habitat for this species. The potential for direct take of individuals is very low. The project will result in the loss of occasional foraging habitat that may be used by the tricolored blackbird. The preferred habitats for tricolored blackbird, emergent marsh and riparian shrub-scrub, are very limited in the Basin, with only 1400 acres within the 55,000 Basin (NBHCP, 1997). Only five acres of scrub-shrub is present on the MAP site. The five acres of habitat would be removed as a result of site development.

Northwestern Pond Turtle. Direct impacts similar to those described above for the giant garter snake could occur for the northwestern pond turtle. Wildlife agency requirements for pre-construction surveys and take avoidance and minimization measures would reduce the direct take of pond turtles during project construction. These measures are listed in Chapter 4. Conversion of existing canals and drainage ditches to urban uses would result in the loss of roughly 76 acres of potential pond turtle habitat.

As with the giant garter snake, the introduction of urban uses could result in the degradation of nearby pond turtle habitat though the activities associated with urban development, such as flood control, weed abatement, rodent control, and storm water runoff. Pond turtles may be subject to harassment resulting from increased levels of human presence and vehicle use; they may be displaced into adjacent unsuitable habitat resulting in increased predation, exposure, or stress through disorientation and loss of shelter.

Habitat alterations that result in loss of cover and lower densities of prey items may increase the vulnerability of pond turtles to avian and mammalian predators, and may also increase pond turtle vulnerability to predation. The urban development could also fragment pond turtle habitat and reduce or eliminate dispersal opportunities between remaining habitat patches, potentially leading to population isolation. .

Valley Elderberry Longhorn Beetle. No elderberry bushes are known or suspected to occur on the MAP site therefore no take of this species is expected.

Loggerhead Shrike. The loggerhead shrike is regularly observed throughout the Natomas Basin most of which comprises suitable habitat for this species. The loggerhead shrike need open habitats with scattered shrubs, trees, fences, and other perches. Several loggerhead shrikes were observed on and near the Metro Air Park project site during a site reconnaissance conducted on March 23, 2000. Most of the MAP site, approximately 1800 acres, comprises suitable habitat for the shrike.

The MAP project will not likely result in take in the form of killing, harming, harassing, or wounding of individual loggerhead shrikes as the birds are very mobile and most of the time can escape direct harm.

The project will result in the loss of occasional foraging habitat which may be used by the loggerhead shrike.

Aleutian Canada Goose, White-faced Ibis, Bank Swallow, Peregrine Falcon, Greater Sandhill Crane. Available data indicate that these species do not occur on the MAP site or that their occurrence is unconfirmed. It is possible that populations of these plant and animal species could be discovered in the future or could colonize the MAP site or one or more of the NBC's habitat reserves during the life of the permit. It is expected that take levels or occurrences of take will be zero, rare, or infrequent for these species, and that the adverse effects of such take will be minor or insignificant. The project will result in the loss of occasional foraging habitat which may be used by these species. Due to their status as State of California fully protected species, no take of the peregrine falcon and greater sandhill crane would occur on the MAP project site, within off-site infrastructure improvement areas, or on MAP mitigation lands.

Delta Tule Pea and Sanford's Arrowhead. Available data indicate that the Delta tule pea and Sanford's arrowhead either do not occur extensively on the MAP site or that their occurrences are unconfirmed. It is possible that populations of these plant species could be discovered in the future or could colonize the MAP site or one or more of the NBC's habitat reserves during the life of the permit. It is expected that take levels or occurrences of take will be zero, rare, or infrequent for these species, and that the adverse effects of such take will be minor or insignificant. The project could result in beneficial impacts to these unconfirmed species as large tracts of habitat reserves become established in the future.

Under the proposed project, adverse effects to covered species and their habitat associated with development of the MAP project will be mitigated by participation in the Natomas Basin regional mitigation program. The regional plan sets forth a program to mitigate the loss of covered species habitat values through long-term protection, creation, and enhancement of upland and wetland habitats under Basin-wide reserve system. Establishment of habitat reserves will provide for the protection of wetland and upland habitats as well as the plant and animal communities they support.

MAP's participation in the regional plan through NBC's programs will incrementally increase the area of large-block habitat reserves created for the benefit of covered species. Large block reserves are preferred over small isolated reserves because they are better able to sustain

adequate population sizes, provide large areas of secure land for movement between species populations, typically provide a higher diversity of habitat types, and they minimize edge impacts of roads and adjacent developed areas.

Under the MAP HCP, the habitat mitigation lands acquired on behalf of MAP by the NBC will protect larger ecosystems and the reserves will be managed in the long-term for the covered species. The current status of the site holds no such assurances.

3. Status of Natomas Basin Conservancy Mitigation Program

Since the MAP HCP identifies the NBC as the preferred entity for carrying out regional mitigation activities using mitigation fees generated by the development of the site, a brief discussion of the status of the NBC is warranted.

The NBC was formed in 1994 but was not in full operation, with staff and a Board of Directors until early 1999. At present, the NBC carries out mitigation activities to implement the regional plan for the City of Sacramento as required by the City's Habitat Conservation Plan and Implementation Agreement.

The City of Sacramento collects mitigation fees for all urban development within its boundaries within the Natomas Basin. As of the end of 2000, the City had collected almost \$10,000,000 in mitigation fees from approximately 3,580 acres of urban development. The mitigation fees were forwarded to the NBC which has acquired 1,630 acres of mitigation lands.

The following is a summary of some of the NBC's accomplishments as described in its 2000 Annual Report:

- The NBC acquired two farms during year 2000, bringing the total number of farms acquired to date to nine.
- The 2000 mitigation acreage total of 1630.82 acres more than met current mitigation requirements.
- Phase 1 environmental reports, American Land Title Association land surveys and aerial photographs were completed on each of the Conservancy's mitigation land acquisitions.
- The NBC worked to protect areas on its mitigation lands where NB HCP species are known to exist.
- Fields were managed in such a way as to encourage Swainson's hawk foraging activity, with a Conservancy experiment on its Silva tract providing excellent results.
- The Conservancy's extensive site-specific land management plan for the mitigation acreage acquired through January 1, 2000 was completed and formally

accepted by the Conservancy's Board of Directors and the state and federal resource agencies.

- Swainson's hawk and giant garter snake surveys were conducted in the Natomas Basin.
- The long-term finance model was updated and a fee increase was requested and granted. (Subsequently, in September 2000, and June 2001, additional fee increases were requested by NBC and approved by the City of Sacramento.)
- A budget process was instituted whereby expense and income tracking will be enabled for each mitigation acquisition beginning January 1, 2001.
- The Conservancy's endowment fund account continues to grow, and remains conservatively invested in order to insure its long-term viability.
- The Conservancy ended the year in strong financial condition.

As discussed above, the NBC completed preparation of a Site-Specific Management Plan (dated July 14, 2000) for the 1,296 acres of mitigation lands acquired for the City of Sacramento as of the end of 1999. According to the Plan "to meet wetland conservation objectives, a minimum of 324 acres (25% of total) will be developed as managed marsh on the various sites; approximately 648 acres (50% of the total) will be maintained in rice production. To meet upland conservation objectives, a minimum of 324 acres will be developed or maintained as uplands that provide foraging, nesting, or future nesting sites for Swainson's hawk."

The work being carried out by the NBC is important to the long-term survival of many of the covered species that occur in the Natomas Basin. Most, if not all, of the species will require active management of their habitats in order to sustain populations in the Natomas Basin. The NBC provides an established institution that has as its primary role, to preserve and actively manage large blocks of habitat for the covered species.

4. Impact of Reserve Management

Habitat restoration and management activities on reserve lands purchased with MAP HCP mitigation fees may, at times, require significant amounts of earth moving and surface disturbance. The most significant earth moving activities would be required to convert dry crop or rice lands to managed marsh wetlands. Since 25% of the mitigation lands are required to be established and maintained as managed marsh, significant earth moving activities could temporarily impact about 250 acres of MAP's 1000 acre reserve land obligation. Depending on the original condition of the managed marsh reserve site, the earth moving activities could permanently reduce available foraging habitat for Swainson's hawks, burrowing owls, and/or could impact giant garter snakes and other wetland species found in converted rice fields. The latter impacts would be temporary and take of individuals would be minimized through the NBC's use of take avoidance and minimization measures.

Additional ongoing reserve management activities may also result in occasional take (e.g. through ditch and drain maintenance, other vegetation management, road kills, etc.). Take levels

resulting from these activities are, however, expected to be minor to negligible because: (1) the NBC will, where applicable, implement take avoidance and minimization measures requested by the wildlife agencies for species on habitat mitigation lands; and (2) the benefits of activities for creating and maintaining the habitat reserve system are expected to more than offset any minor take which could occur. Development in the MAP area is expected to result in the establishment of as much as 1200 acres of reserve lands that could be subject to minor levels of incidental take.

In addition, take for scientific purposes (e.g. during monitoring) could periodically occur, particularly with the giant garter snake. In this instance, take would be from handling or trapping individuals and should not result in mortality to individuals. Such take would be carefully monitored by the USFWS and CDFG through scientific permit reporting requirements of the Biologist used to carryout the monitoring programs.

E. Species Recovery

MAP POA and its landowners will participate in the regional conservation strategy set for the in the NBHCP. That strategy as set forth in the NBHCP as modified in the MAP HCP may be adjusted as a result of recommendations in the final Giant Garter Snake Recovery Plan or a future Swainson's Hawk Recovery Plan. A Draft Giant Garter Snake Recovery Plan was made available for public review in July 1999 (see under E. 1. below). The MAP HCP incorporates a recovery plan adaptation provision (see Section 6.5 in the MAP IA) that allows for modifications to the regional conservation strategy in light of future recovery plans when and if such plans are approved.

Ultimately, recovery of the giant garter snake depends on conservation of garter snake populations throughout the Central Valley, including the Natomas Basin which is within the Mid-Valley Recovery Unit as defined by the FWS in the Draft Giant Garter Snake Recovery Plan (see Section E. 1. below). The American Basin population, which includes the Natomas Basin, is one of six that are contained within the Mid-Valley Recovery Unit. Protection from threats that would limit all six populations within this Recovery Unit are important to recovery of the species (Draft Recovery Plan, 1999).

The regional mitigation program provides a system of reserves and establishes an entity (the Natomas Basin Conservancy) to administer the program in perpetuity. By maintaining a stable population of giant garter snakes in the Basin, and through the recovery plan adaptation described above, the MAP HCP effort will contribute to statewide giant garter snake recovery efforts.

The MAP HCP also allows for some mitigation lands to be purchased out-of-Basin provided the lands meet identified biological criteria (see Chapter III. D. 3). The purpose of this provision is potentially to reduce the cost of the Plan by allowing acquisition of lower-cost land and to reduce the impact of land acquisition on farming in the Basin. However, this provision could also benefit giant garter snake recovery by creating reserves on behalf of important out-of-Basin garter snake populations.

1. Consistency with Recommendations in Draft Recovery Plan for the Giant Garter Snake, 1999

The USFWS published a Draft Recovery Plan for the Giant Garter Snake (GGS DRP) in July 1999. The Natomas Basin population of the giant garter snake is contained within the American Basin population in the Mid-Valley Recovery Unit as described in the Draft Plan. The GGS DRP promotes the development of habitat conservation plans to minimize and mitigate impacts to the giant garter snake and states that HCPs should be consistent with recommendations in the GGS DRP (page 71).

Generally the strategies in the GGS DRP are consistent with the conservation strategies of the MAP HCP and the NBHCP. Specifically, the GGS DRP recommends the NBHCP be refined based on ongoing research. Currently, the GGS DRP recommends the percent of managed marsh remain at a minimum of 25% until research shows marsh supports a greater or equal number of giant garter snakes as rice. The percentage of marsh should increase if research shows marsh to support more giant garter snakes.

The GGS DRP addressed the need to maintain and create corridors between existing populations to enhance population interchange. The NBHCP includes a reserve acquisition criteria that states: "blocks of reserve lands must also be hydrologically connected to other blocks through irrigation and drainage systems or other systems to ensure connectivity and opportunity for travel by garter snakes between sections of the reserve system" (page IV-9).

Statements made on page 44 of the GGS DRP confirms the NBHCP's premise that the establishment and management of wetland habitat suitable for the giant garter snake will also provide benefits to other wetland associated species including the tricolored blackbird, white-faced ibis, western pond turtle, and waterfowl in the Central Valley.

Page 51 of the GGS DRP includes a recommendation that reserves acquired under the Natomas Basin HCP be within the Southern American Basin (within the same population and watershed basin) rather than in out-of-basin areas (Area C). Consistent with that recommendation, the MAP HCP does not allow for any out of basin acquisitions in Area C.

III. PLAN IMPLEMENTATION

A. Plan Participants

1. Permitors

a. U.S. Fish and Wildlife Service

The USFWS has the authority for issuing Section 10(a)(1)(B) incidental take permits under the ESA and will be responsible for monitoring and enforcing the provisions of the MAP HCP permits, assuring MAP POA's compliance with the HCP, reviewing annual status reports and responding to requests for amendments. The USFWS will also maintain and provide to MAP POA current covered survey protocols and agency approved take minimization measures where applicable.

b. California Department of Fish and Game

The CDFG has the authority for approving Section 2081 incidental take permits under CESA and will be responsible for monitoring and enforcing the provisions of the MAP HCP permits, assuring MAP POA's compliance with the HCP, reviewing annual status reports and responding to requests for amendments.

The CDFG will maintain and provide to MAPPOA upon request a list of biological consultants that are qualified to carry out pre-construction surveys and implement take minimization measures for specific state-listed species found in the Natomas Basin.

2. Permittees**a. Metro Air Park Property Owners Association**

Under the MAP HCP, MAP POA, a California non-profit mutual benefit corporation, representing 1892+/- acres of land with 138 individual landowners in 22 ownership groups, is the permittee. MAP POA's permit obligations and take authorization are enforceable by MAP POA upon all landowners who develop their properties through Covenants, Conditions and Restrictions (CC&Rs) binding those landowners to comply with the terms of the MAP HCP. All new development in the MAP HCP area by MAP POA landowners is required to minimize and mitigate impacts on covered species and their habitats in compliance with the MAP HCP and state and federal law.

Individual landowners will be covered by the state and federal permits through the issuance by MAP POA of a Certificate of Inclusion to each landowner who has signed the CC&Rs and when specific mitigation requirements, including fee payment and take minimization measures, have been met. Landowners who may in the future elect to grow rice on their lands, will be covered by the permits through a Certificate of Inclusion issued by MAP POA upon entering into a binding agreement with MAP POA to incorporate farming practices that benefit wetland habitat values by following BMP's.

Only approximately 40 acres of land within the MAPSPA are owned and managed by non-MAP POA members at this time. Individual(s) or entities not members of MAP POA are not covered by this HCP, and the 40 acres is not counted as part of the 1892 acre MAP SPA area. When those entities not currently members of MAP POA propose to develop their lands and desire coverage by the ITP's, they can do so any time after becoming a member of MAP POA, signing the CC&R's and complying with this HCP and associated IA and permit. Non-landowning rice farmers (i.e., lessees, share croppers, etc.) who have not previously signed the CC&Rs, will also be required to sign these binding agreements and follow Best Management Practices (BMPs), to obtain take authorization under MAP POA's permits. Non-signing landowners represent precisely 40.43 acres and are identified in Exhibit "A" to the Implementation Agreement. Appendix C contains the BMP's for rice field management to enhance wetland values.

MAP POA will assure compliance with the Section 10(a)(1)(B) and 2081 permits through

the mechanisms described in Section 3.1 of the MAP IA.

3. Compliance Monitor and Biological Consultant

Prior to any surface disturbance of land, MAP POA shall retain and fund an HCP Compliance Monitor who shall act as a liaison to USFWS, CDFG, and the NBC for communications concerning the MAP HCP and IA. The Compliance Monitor, to be approved by the USFWS and CDFG, shall be responsible for monitoring implementation of and compliance of the IA, ITP, and HCP, including all take minimization measures identified in Section III. C. 2 of the HCP. The Compliance Monitor shall have the authority and the responsibility to provide notification to the County of any violation of, or noncompliance with, the HCP, IA, or ITP. Refer to Section 3.1.11 of the IA for more details.

MAP POA shall also retain a biological consultant, approved by USFWS and CDFG, to implement certain components of the MAP HCP, including but not limited to the conducting and reporting of preconstruction surveys, and compliance with conservation strategies and take minimization and reduction measures specified in the MAP HCP or, alternatively, MAP POA may enter into an agreement in the future with the County of Sacramento to perform such tasks. Refer to Section 3.1.12 of the IA for more details.

4. Plan Operator

a. The Natomas Basin Conservancy

The NBC will serve as the Plan Operator for the MAP HCP. In this role, the NBC will receive MAP mitigation fees from the County and will be responsible for the selection, acquisition, enhancement, monitoring and management of reserve lands. The NBC is also responsible for the preparation and timely submission of management plans for reserve lands, including the Swainson's Hawk Reserve. Refer to Section 3.4 of the IA for more details of NBC's obligation under the MAP HCP. A discussion of the functions the NBC will perform under the Regional Plan, including acquisition and management of reserve lands, are contained in Appendix A. NBC's adopted Resolution and Agreement with MAP POA outlining these functions are included in Exhibit H to the IA.

5. County of Sacramento

MAP POA has entered into an agreement with the County of Sacramento to promote compliance by MAP POA landowners with the HCP, IA and ITP. In accordance with the County's agreement with MAP POA (contained as Exhibit H to the IA), the County shall: 1) receive HCP mitigation fees and as soon as reasonably possible after receipt, disburse the fees to the NBC; 2) as part of its normal regulatory processes, issue urban development permits (principally grading permits) to MAP POA landowners, and 3) will cease to issue, and/or suspend any issued urban development permits to a particular landowner upon notification that landowner is not in compliance with HCP requirements. Refer to Exhibit H of the IA for more details. Because the County Agreement was executed prior to completion of the MAP HCP and the IA, it does not fully track the provisions of the final version of these documents. As a result, MAP POA shall enter into a new agreement with the County within 120 days of the date the ITPs are issued. The new agreement shall be acceptable to the USFWS and CDFG and shall

conform to the provisions of the final HCP and IA.

B. Plan Funding

Habitat Conservation fees will be collected at the time the grading permits are issued. These fees will be financed through a combination of Mello-Roos Community Facilities District bond proceeds, development fee program proceeds, direct payments from developers and Property Owners Association Assessments. MAP POA and its members are liable for all additional monetary obligations that may be required to fully implement the land acquisition, ongoing or permanent management, monitoring, adaptive management, recovery plan and Changed Circumstances requirements of the MAP HCP and NB HCP.

1. Mello-Roos Bonds

MAP POA in conjunction with the County of Sacramento (County) has formed a Community Facilities District (CFD) that has defined major infrastructure needed for the full build out of MAP. Based on the phased build out of MAP and the estimated cost of all public facilities improvements, a financing plan has been prepared (MAP Public Facilities Master Plan, August 2000). This financing plan provides for the funding of such facilities through development fees paid or from Mello-Roos Bond proceeds when grading permits are issued. The County of Sacramento Board of Supervisors voted September 26, 2000 to approve a resolution to establish Metro Air Park CFD and to provide for the levy of special taxes and to approve a resolution declaring the necessity to incur a bonded indebtedness. The property owners within the CFD have authorized through an election the issuance of a certain principal amount of special tax bonds (Bonds) under the Mello-Roos Community Facilities Act of 1982. Pursuant to the election, the County may authorize the levy and collection of a special tax from the CFD properties for the purpose of paying interest on and principal of and redemption premiums on the Bonds. The County may issue the tax-exempt bonds to finance a portion of the infrastructure improvements and mitigation costs associate with the MAP project. The subject bonds will be secured by a special tax levied against property within the project. The special tax is secured by a lien in favor of the County of Sacramento. Failure to pay the special tax lien could result in foreclosure by the County to collect lien proceeds. In any event, the proceeds from the sale of the tax-exempt bonds will be available for payment of the relevant portion of the HCP fees, irrespective of whether special taxes are paid or not paid.

The Mello-Roos bonds for the tier one on-site and off-site sewer infrastructure will provide funding for the backbone infrastructure for the MAP site (i.e., roads, utilities, etc.) and for the payment of HCP mitigation fees for impacts to Covered species habitat resulting from tier one, sewer infrastructure and Swainson's hawk nest tree removal. Mitigation fees will be paid for a total of 191 acres of development, including 150 acres of initial on-site development and 41 acres of off-site sewer improvements, and the 200 contiguous acres of suitable Swainson's hawk nest tree and foraging habitat required to be transferred to NBC. Payment of the mitigation fees and transfer of the Swainson's hawk nest tree reserve lands, will be made by MAP POA prior to the commencement of development activities at any development site within MAP covered lands and reimbursed from the bond proceeds after the bonds are funded. At the time of payment, mitigation fees will be paid to the County and turned over to the Natomas Basin Conservancy (NBC). After the initial payment of fees for tier one development and sewer improvements and transfer of the Swainson's hawk nest tree reserve, HCP mitigation funds will be paid to the NBC

prior to habitat disturbance activities such as grading or grubbing for development purposes.

The approved version of the Master Plan shows that the costs included in the initial Mello-Roos bonds for public improvements totals \$67.66 Million. An initial payment of approximately \$750,000 will be paid for the impacts of disturbance caused by installation of the 150 acres of on-site initial infrastructure improvements and 41 acres of off-site sewer improvements which, under the 0.5:1 mitigation ratio, will provide for the acquisition of 95 acres of habitat reserve. The Mello Roos bonds will also pay for the 200-acre Swainson's Hawk nest tree reserve (see Table 5 for breakdown of the fee for Swainson's hawk nest tree mitigation. The NBC has estimated the cost of nest tree mitigation lands to be \$1,900,000 if the NBC purchases the mitigation lands and if no revenue from rice lands or hunting is assumed. All fees generated from the Mello Roos or similar bonding mechanism must be collected prior to disturbance of the 191 acres. Payment for subsequent tier two off-site drainage and roadway improvements will be funded by subsequent Mello Roos bond proceeds that have been preauthorized. Mitigation funds covering those offsite improvements will be paid to the NBC prior to habitat disturbance activities on the off-site lands such as grading or grubbing.

2. 0.5:1 Mitigation Fee

Under the MAP HCP, individual landowners/developers will pay a one-time mitigation fee on the gross acreage of the parcel(s) which will be converted to urban development. The mitigation fee will be the same as that approved currently and in the future by the City of Sacramento under the Regional Plan. City fees were increased to \$5,993 on June 12, 2001 by Sacramento City Council Resolution 2001-391. The mitigation fee is broken down into five components which are listed in Table 4.

The initial Regional Plan mitigation fee was arrived at following a detailed analysis of the fees necessary to adequately fund all the functions of the NB HCP. The economic analysis was prepared by Economic and Planning Systems (EPS) in conjunction with the Sacramento Area Flood Control Agency (SAFCA). The full analysis, including all of the assumptions and supporting basis, is presented in EPS, 1995 (see Appendix B of NBHCP). The EPS/SAFCA estimate of the fee per acre in 1995 dollars necessary to support the functions of the NBHCP was \$2,240 per developed acre of land. On September 2, 1997, by Resolution No. 97-508, the Sacramento City Council increased the NBHCP mitigation fee, in part, to reflect less reliance on hunting revenues to support NBHCP funding needs. The fee was increased again by the Sacramento City Council in August 1999, September 2000, and June 2001. The 2001 fee increase breakdown is shown below in Table 4.

TABLE 4
MITIGATION FEE COMPONENTS PER ACRE DEVELOPED *

Land Acquisition	\$3,000.00
Restoration/Enhancement/Monitoring	\$ 368.00
Administration O & M	\$1,555.00
<u>O % M Endowment Fund</u>	<u>\$ 950.00</u>
Subtotal Mitigation Fee	\$5,873.00
Fee Collection Administration (2% of fee)	\$ 120.00
Total Fee Per Gross Developed Acre (2001\$)	\$5,993.00

*For funds available to support management of each acre of mitigation land, multiply these figures by two.

The "MAP Baseline Map" is contained in Exhibit "A" to the Implementation Agreement and is submitted to the USFWS and CDFG with the MAP HCP as Figure 7. This map and Figure 4 (Off-Site Improvements) show the covered lands that are subject to the mitigation fee.

The Metro Air Park project could pay mitigation fees on as many as 1,892 acres of the project site (the entire site) and 123 acres of off-site infrastructure which are proposed for development. Using the \$5,993 per acre fee established in the NBHCP, and multiplying it times 2011 acres, the project could ultimately generate as much as \$12,000,000 in mitigation fees.

Payment of mitigation fees will be phased over the 30-50 year build-out period. After the initial infrastructure improvements are completed, individual landowners will pay mitigation fees on those phases of the project that they develop. To encourage the retention of habitat values on existing agricultural lands until development occurs, any existing agricultural land in the MAP area will be subject to the payment of development mitigation fees if the landowner voluntarily elects to take land out of agricultural production for a period of more than one year prior to the receipt of development permits on the land to which they apply, or if lands are left fallow (not seeded) for over a period of three years. Mitigation fees will also be collected for any lands temporarily disturbed by Tier One Urban Development which are not returned to agricultural production within twelve consecutive months following completion of the particular Tier One Urban Development project, including the off-site sewer line extension. In each case the lands will be considered to be converted to Urban Development.

Landowner fee payments must be paid to the County before the landowner/developer receives the final grading permit for the phase of the project they are developing. In addition, landowners must provide written documentation to the County that they have carried out pre-construction surveys and implemented Resource Agency approved take minimization measures on the development site prior to obtaining final grading permits. Copies of the fee payment and take minimization certificates will be submitted to the NBC, USFWS and CDFG.

Optionally, with written approval from the MAP POA, NBC, USFWS, and CDFG individual landowners may donate land to the NBC in lieu of payment of some or all of the acquisition component of the mitigation fee. The landowner will be required to pay the most current administrative, endowment, and habitat management components of the mitigation fee on donated land. In such cases, the NBC, USFWS, and CDFG will determine which lands are acceptable, considering location, proximity to urban uses and roads, and current condition. Open space left within developed areas will require mitigation. Areas determined to be suitable for mitigation must be transferred to the NBC or another suitable entity approved by the USFWS and CDFG or be encumbered by a conservation easement approved by the USFWS and CDFG.

Refer to Section 4.5 of the MAP IA for more details on the mitigation fees.

a. Fee Adjustments

The MAP "base fee" will be subject to the same adjustments that apply to the Regional Plan with the exception that the NBC will adjust the base mitigation fee as necessary, on its own or at the request of FWS or CDFG. Adjustments to the base fee will be made to account for inflation or deflation using the Consumer Price Index (CPI) or another suitable index and to maintain the .5 to 1 mitigation ratio. The base fee will also be adjusted to respond to changes in land acquisition, monitoring and reserve management costs and adaptive management, recovery plan or Changed Circumstances modifications to the plan. Adjustments to the base mitigation fee to account for inflation or deflation, or as necessary to maintain the 0.5-to-1 mitigation ratio and to meet ongoing management and monitoring costs shall be considered minor amendments to the NBHCP. Base fee adjustments will also be considered a minor amendment to the MAP HCP.

Because the base fee consists of individual components (e.g. land acquisition, restoration/enhancement/monitoring, and the operations and maintenance endowment), the base fee may be raised with respect to specific fee components periodically found to be deficient over the term of the permits. In other words, all components of the mitigation fee as described in Table 4 are subject to base fee increases as necessary to ensure that the requirements of each individual component of the MAP HCP are met.

In addition to specific adjustments of the MAP HCP mitigation fees, the MAP HCP fees shall be adjusted automatically to insure the fees are at least equal in amount to the base mitigation fees applicable to the NBHCP, as the latter may be adjusted from time to time.

3. Swainson's Hawk Nest Tree Mitigation Fee

Prior to commencing any infrastructure or other development within the permit area, MAP POA shall transfer to NBC lands determined by the NBC, USFWS, and CDFG to provide suitable Swainson's hawk nest tree and foraging habitat or provide funds in an amount determined by NBC to be adequate to purchase 200 acres of Swainson's hawk nest tree mitigation lands. In addition, MAP POA shall transfer funds to the NBC adequate, as determined by the NBC, to fund the habitat management, endowment, and administrative fee components identified in Table 5 below which shows the current estimate of the mitigation fee components of the Swainson's hawk nest tree mitigation requirement.

If MAP POA elects to transfer the acquisition fees to the NBC in lieu of land, the NBC shall acquire the 200-acre reserve within 12 months of the transfer of such fees.

4. Property Owner Assessments

MAP POA is a non-profit mutual benefit corporation that is acting as the permittee under the Section 10(a)(1)(B) Permit on behalf of those landowners and developers in the Metro Air Park Special Planning Area of the Natomas Basin who are signatories to the MAP POA CC&R's. A primary duty of MAP POA as permittee will include enforcement of the terms of the HCP and IA on its member landowners and all agents and contractors acting on its behalf. Therefore, MAP POA and its members are liable for all additional monetary obligations that may be required to fully implement the land acquisition, on-going or permanent management,

monitoring, adaptive management, recovery plan, Changed Circumstances and any other requirements of the MAP HCP and IA. In order to finance the costs associated with MAP POA's duties, MAP POA has the legal authority, established pursuant to recorded CC&R's to levy assessments against each property owner. If an assessment is not paid, MAP POA has the authority to impose a lien on the property to enforce fee collection. If the lien is not timely satisfied, MAP POA has the authority to foreclose on the property, sell the property at public auction, and use the proceeds of such sale to satisfy the costs incurred by MAP POA in the performance of its duties. If for any reason, amounts are owed to defray costs incurred under the terms of the ITP which have not been covered by the above-described bond proceeds or permit mitigation fees, MAP POA will assess its property owners for these costs and pay over such assessments to the NBC. If, for any reason, a landowner fails or refuses to pay its assessment, MAP POA is authorized to impose a lien and, if necessary, proceed to foreclosure on that property to collect the assessments from the proceeds of the foreclosure sale. Alternatively, MAP POA may choose to raise the assessment on all other property owners, collect these assessments and pay them over to the NBC, and reimburse itself from the proceeds of the foreclosure sale.

5. Funding for Compliance Monitor

MAP POA shall fund the costs of the MAP HCP compliance monitor described in Section III. A. 5 above and the cost of implementing the take minimization and other HCP measures described in Section III. C. below whether implemented by MAP POA, the biological consultant or the County through the construction management cost provision of the Mello-Roos bonds identified in Section III. B. 1. MAP POA shall secure any additional funding required for these purposes through periodic assessments on MAP POA member landowners pursuant to the CC&Rs attached as Exhibit G to the IA.

6. Plan Costs

As explained above, the Regional Plan mitigation fee was developed from a detailed analysis of the amount of the fee assessment necessary to adequately fund all the functions of the NB HCP. The financial model used by the NBC for that detailed analysis is maintained by EPS. EPS periodically revises the NBC's analysis to reflect current experience in land acquisition, restoration, and enhancement, operation and maintenance, and administration costs and revenues. In May 2001, EPS put together a memorandum for the NBC detailing on the status of the fee that supports the implementation of the NBHCP (Appendix D). New information obtained by the NBC caused a change in the assumptions behind each of the fund categories mentioned above. As a result of that analysis, the mitigation fees were raised to their current level of \$5,993.

The recent NBHCP base mitigation fee increase was based on an updated cash flow analysis prepared by EPS. The base fee cash flow analysis incorporates updates such that the cash flow modeling more accurately reflects the experience and projected operations of the NBC. These updates include:

Rice Revenue Projections: Rice revenues were modeled to more precisely match current estimates of projected revenues over the next two years.

Revised Administrative Cost Estimates: Administrative costs were revised based on the

current budget estimates of the NBHCP.

Fund Balance Adjustments: The cash flow analysis was adjusted such that beginning balances in 2001 match actual fund balances of the NBHCP as of December 31, 2000.

Transfer from O&M/Administration to Restoration & Enhancement: The HCP fee program since conception was structured to allow transfers of funds between the Land Acquisition, Restoration & Enhancement, and Administration/O&M funds based on any surpluses or deficits that might exist in those funds. Currently, the O&M/Administration fund has operating surpluses due to operating and administrative efficiencies of the NBC while the revenues for Restoration & Enhancement need to be supplemented over the next few years due to higher than anticipated restoration and enhancement costs for marsh lands. Not only is the cost to restore and enhance managed marsh significantly higher than the original plan estimated, it is also anticipated that managed marsh restoration and enhancement obligations will be far more intense and concentrated than provided in the original plan due to a more condensed period of development activity. Therefore, a transfer from the O&M/ Administration fund to the Restoration & Enhancement fund was assumed in 2003 and 2004 in the cash flow model.

Hunting Lease Revenues: The NBC has recently entered into a contract for the management of hunting operations on NBC lands. Based on projected revenues to the NBC from the providers of these services, projected hunting revenues were revised to reflect a more realistic projection of the likely net operating income. The current cash flow analysis assumes \$12 per hunting acre whereas the July 2000 update assumed hunting revenues of approximately \$37 per hunting acre.

Administrative Costs Post-Land Acquisition: Previous versions of the financial analysis have assumed that administration costs would be reduced by 67 percent after all mitigation lands have been acquired. Based on discussions with the NBC and information provided by NBC's Executive Director John Roberts, we have come to the conclusion that it is unrealistic to assume a significant decrease in administrative costs once all land acquisition has been completed. Therefore we have assumed a 15 percent reduction in administration costs. The reduction allows for a decrease in legal expenses but leaves intact funding for most other administrative expenses. This revision to administration costs over the long term represents approximately a 20 percent increase in the O&M/Administration expenditures on an annual basis. However, the O&M/Administration fee is a relatively small component, approximately 16 percent. of the overall fee program, including the Settlement Agreement Premium for land acquisition.

Acceleration of Fees Paid (Grading Permits Pulled): Past cash flow model analyses have assumed a 50-year development absorption schedule for the 17,500 acres of planned development in the Natomas Basin. Historical development over the last three years has been substantially greater than anticipated by the original cash flow analysis. Given recent market trends, it is likely that development activity will continue to be at higher levels than originally projected. Even if the market slows, and as a result development activity also slows, there is a very high probability that developers will pull grading permits even if they do not plan to develop the property in the immediate future in order to avoid future delays in the permitting process due to the legal challenges to the NBHCP fee. Therefore, the current cash flow analysis assumes a 15-year development period, during which grading permits are projected to be pulled and the NBHCP fees paid. Actual development may substantially lag the grading permit stage.

Refer to Appendix D for more details including assumption tables.

The NBC used the cash flow analysis to determine the mitigation fee payment for the Swainson's hawk 200-acre nest tree mitigation lands. The model used the same four major funding assumptions mentioned above. The assumptions used in the analysis were: (1) mitigation must take place within the Basin; (2) the rules governing mitigation land available for acquisition are consistent with those in the current HCP; (3) no rice production could take place; (4) light grazing would be allowed; and (5) the land would be restored to native grasslands. The NBC estimated the cost of nest tree mitigation lands to be \$1,900,000 if the NBC purchased the mitigation lands and if no revenue from rice lands or hunting is assumed. The fee increase breakdown is shown below in Table 5.

TABLE 5
MITIGATION FEE COMPONENTS PER ACRE DEVELOPED FOR SWAINSON'S
HAWK NEST TREE MITIGATION

Land Acquisition	\$5,000
Restoration/Enhancement/Monitoring	\$ 996
Administration O & M	\$2,550
<u>O % M Endowment Fund</u>	<u>\$ 800</u>
Subtotal Mitigation Fee	\$9,346
Fee Collection Administration (2% of fee)	\$ 188
Total Estimated Fee Per Gross Developed Acre (2000\$)	\$9,534

The Endowment Fund fee is raised to \$800.00 per acre (compared to the normal \$190.00) on the 200 acres of MAP POA supplemental Swainson's hawk mitigation land. Because the Plan does not assume farming revenue for this mitigation land, there is a shortfall in funding in the Administration Fund at the end of the 50-year permitting phase of the Plan. Therefore, the Endowment Fund must be drawn upon to make up for any shortfall in revenue. In order to assure sufficient interest earnings in year 50, the Plan requires an initial principal balance of \$160,000.00 (or \$800.00 per acre over 200 acres). In essence, the additional money assures that in the later years of the Plan's implementation, there are enough funds to sustain the operations and maintenance of acquired mitigation lands.

7. Provisions to Assure Plan is Adequately Funded

The MAP HCP and Implementation Agreement (IA) incorporate several mechanisms to ensure the plan is fully funded. Section 4.5.7(1) of the IA provides that the NBC shall either on its own or at the request of either USFWS or CDFG, adjust the Base Mitigation fee to take into account the increased costs of land acquisition and NBC operations, including ongoing management and monitoring costs, or as necessary to ensure that the mitigation ratio of .5 acres of mitigation land to 1 acre of development is met. Section 4.5.7(2) of the IA requires the automatic adjustment of Base Mitigation Fees whenever the Base Mitigation Fees under the NBHCP are adjusted to ensure the MAP fee is at least equal to the current fees assessed under the NBHCP. Section 4.5.7(3) provides a process by which increases in land values during and

after development provide many-fold the necessary security interest to offset any reasonably foreseeable increases in fees necessary to meet increases in costs "to fully implement the land acquisition, on going or permanent management, monitoring, adaptive management, recovery plan and Changed Circumstances requirements for the NBHCP and the MAP HCP."

Further assurances include the fact that the value of developed land that MAP POA would assess, lien, and if necessary, foreclose upon and sell, will be such that no landowner would dare risk loss of its investment simply to avoid costs of additional mitigation and/or management, even if it means establishing and maintaining preserves which are seventy-five percent (75%) marsh. In addition to that, in almost all instances, properties will be subject to bank mortgages which will be junior to MAP POA's liens. Banks typically will not allow its mortgages to be "wiped out" by foreclosures. Banks in this situation will typically step forward and "cure" the situation by paying any additional assessments in order to protect its loan/mortgage interest.

Section 4.5.8 requires NBC to adjust the fees annually to take into account the effects of inflation/deflation. The NBC is also required to adjust the Base Mitigation Fee in response to recommendations made in future GGS or Swainson's hawk recovery plans and pursuant to the adaptive management provisions of the plan. The MAP IA further provides that the final 10 percent of covered lands under the MAP HCP may not be developed until mitigation lands representing mitigation for those lands have been acquired by NBC. (IA at Section 5.5.2.) Thus all mitigation lands must be acquired before full buildout under the MAP HCP occurs.

An additional Swainson's Hawk Nest Tree Mitigation Fee is imposed under the MAP HCP and IA to fund the purchase of 200 acres of suitable habitat to mitigate for the impacts of removing a Swainson's hawk nest tree and surrounding foraging habitat in MAP SPA. Under Section 4.5.9 of the IA, MAP POA must transfer such Swainson's hawk mitigation fees to NBC prior to commencing any urban development on the covered lands. Mitigation fees covering initial infrastructure development that will precede any development of individual property within MAP SPA must also be paid to NBC before development begins (IA at 4.34).

Finally, the MAP POA, through "Covenants, Conditions and Restrictions" (CC&Rs) applicable to its member landowners is required to impose "Additional Monetary Obligations" beyond the mitigation fees if NBC's periodic adjustments to the mitigation fees prove insufficient to fully implement the land acquisition, on-going or permanent management, monitoring, adaptive management, recovery plan or Changed Circumstances provisions of the MAP HCP. (IA at Section 4.5.7(3)). By delaying ultimate build out of the covered lands until all mitigation lands have been acquired, by providing for periodic adjustment of the mitigation fees to meet increased acquisition, management and other plan costs, and by MAP POA's commitment to assess its member owners such additional fees as may be necessary to fully implement the plan, the MAP HCP and IA do ensure funding adequate to carry out the plan.

The funding mechanisms in the MAP HCP are not "voluntary." Pursuant to the MAP HCP and IA, MAP POA is required to assess mitigation fees on all member landowners for initial infrastructure improvements and for the Swainson's Hawk Nest Tree Mitigation Reserve, as necessary above and beyond the initial infrastructure Mello-Roos bond financing, prior to any development under the ITPs. (IA at section 4.5.9). Thereafter, MAP POA is required to assess mitigation fees on each individual landowner at the time an urban development permit is

obtained for a particular parcel. Payment of such fees is required as a condition of receiving a grading permit from the County of Sacramento. IA at Section 3.1.14. As noted above, adjustments to the Base Mitigation Fees to take into account increased acquisition, management and other plan costs are not "voluntary." The NBC is required on its own or at the request of the Service or CDFG - to adjust mitigation fees as necessary to meet its expenses in acquiring and managing mitigation lands. (MAP HCP mitigation fees also must be adjusted as necessary to keep pace with any adjustments made to NBHCP mitigation fees.) Adjustments to any component of the fees can be made at any time by NBC to fully account for increased plan costs.

As a final backup mechanism to provide for unexpected plan implementation cost increases, MAP POA, through CC&Rs, maintains the continuing ability to assess its member landowners additional fees necessary to fully implement the plan. (Under Section 4.5.7(3) of the IA, MAPPOA is required to impose such additional fees on its members as necessary to fully implement the MAP HCP and under CC&R Sections 6.1 and 8.1.2, each member landowner is obligated to pay all ITP related fees.) Sections 7.9 and 8.1.2(c) of the CC&Rs vest MAP POA with the legal authority to impose a lien upon an owner's parcel and foreclose on the lands of any member who refuses to pay an assessment or otherwise fails to comply with the terms and conditions of the MAP HCP and ITP. The CC&Rs are binding on all MAP POA landowners and their successors in interest as provided in Article 10 of the CC&Rs and, pursuant to Section 8.1.2(e) of the CC&Rs, none of the provisions relating to the ITPs and HCP may be modified, amended, revoked or terminated without the prior written consent of the Service and CDFG.

Failure by MAP POA to comply with its obligation to assess fees under the MAP HCP and IA could trigger suspension or revocation of the ITPs, subject MAP POA to civil and criminal penalties under the ESA for failure to comply with the conditions of its permit, and subject MAP POA to legal action under Section 7.2 of the IA for breach of contract, including specific performance and injunctive relief. While the Service considers the prospect of additional fee assessments to be remote given the other funding safeguards built into the plan, there is no reason to doubt the commitment and authority of MAP POA, as expressed in the IA and through the mutually binding CC&Rs on all members, to assess and collect such fees. As outlined above, there are several remedies available to the Service to redress a failure by MAP POA to assess fees.

The commitment to fund mitigation made by MAP POA applies solely to mitigation arising from MAP HCP covered activities. MAP POA has no responsibility to "cover" increased costs attributable to the mitigation obligations of other NBHCP permittees. The NBC will be required to separately account for all mitigation lands acquired under the MAP HCP, and MAP POA generally will be required to bear a proportionate cost of the management and monitoring of mitigation lands based on the ratio of the number of mitigation acres acquired with MAP POA mitigation fees to the total number of mitigation acres. All fee increases attributable to the 200 acre Swainson's hawk nest tree mitigation reserve will be the sole responsibility of MAP POA. While the Service expects that a revised NBHCP will also include additional funding mechanisms to assure funding full plan implementation tailored to the particular circumstances of the permittees under that plan, the MAP HCP and ITP are independent of any future NBHCP. It will not be the responsibility of MAP POA to make up any funding shortfall that might arise from another incidental take permit.

Accounting systems are already provided for and described in detail in the MAP HCP and

IA to track both mitigation fee payments and mitigation land acreage acquisitions by MAP, in a manner totally separate from the City.

MAP IA Sections 3.1.9 and 5.1--5.7 describe detailed measures to ensure that MAP HCP habitat management and protection will adequately be taken into account. Sections 3.1.9 and 5.2, specifically state that MAP will provide NBC with both "monthly accounts of the numbers of acres under development and the amount of mitigation fees paid to County" as well as "an annual accounting of the number of acres under urban development, mitigation fees paid, and the number of rice farming acres."

Section 3.1.9 adds that "MAP POA has to maintain, and provide to MAP POA, NBC, USFWS and CDFG an annual report, calculated from the Effective Date, including any portion of a year during which the Permit is in effect, detailing the cumulative amount and location of lands within the Permit Area as to which Urban Development Permits have been issued. The report shall also specify the mitigation that was applied to such lands. NBC shall incorporate this annual report into the annual report it must submit under Section 3.4.4 of this Agreement and Chapter IV, Section G.4 of the NBHCP. USFWS and CDFG shall use this annual report, together with annual report provided by NBC, for the purpose of monitoring whether the appropriate level of HMR land is being conserved based upon the number of acres of land which has been converted to Urban Development by Urban Development Permittees."

The MAP POA-County Implementation Agreement, paragraph 3, confirms this arrangement (Exhibit H to the MAP IA).

MAP IA Section 5.5.1 specifies that "[a]cquisitions of Conservancy Lands shall be in accordance with the NBHCP and NBIA provided that the 400 acre minimum block and 2,500 acre minimum block requirements shall be applied in the aggregate to all approved HCPs in the Natomas Basin that are based upon the NBHCP, that the plans as a whole must achieve the identified habitat block acquisition requirements", and specifies that, "in the event the NBHCP is not in effect, MAP POA retains the independent obligation to acquire a minimum of two 400-acre habitat blocks, as defined in the NBHCP, but is not required independently to meet the 2,500-acre minimum habitat block requirement."

C. Take Mitigation and Minimization Measures

1. Mitigation Measures

The primary mitigation for impacts to covered species resulting from the MAP project is the acquisition of lands for the purpose of creating and managing permanent habitat reserves. For every one acre of land developed in the MAP project area, one-half acre of land will be set aside as a habitat reserve. The 1997 NBHCP established the 0.5 to 1- (0.5:1-)acre mitigation ratio. It represents an overall average for the entire Natomas Basin and reflects the loss of similar amounts of poor quality habitat, such as orchards and sugar beet fields, as well as the loss of higher quality habitat, such as rice fields, wetlands, and riparian habitat. The ratio also reflects the added values that will result from actively managing the 0.5:1 reserve lands for the benefit of the covered species. This ratio amply mitigates for the impacts of take from the Metro Airpark project.

As discussed in Chapter II. A. there are no longer any actively-farmed rice fields on the Metro Airpark lands. The only extant giant garter snake habitat on the project lands consists of approximately 76 acres of canals and ditches, several of which, however, no longer maintain consistent water supplies or giant garter snakes due to the curtailment of rice farming. Significant portions of the non-rice agricultural lands within the project have been left fallow and are filled with dense patches of upland weed species, which provide moderate foraging habitat for most of the upland Covered Species. Given the deteriorated status of project lands as habitat for the Covered Species, particularly the giant garter snake, the 0.5:1 mitigation ratio, combined with the active management of higher-quality habitat reserve lands provided for under the plan, will mitigate for the impacts of take by the project in a biologically-sound manner.

There is a single active Swainson's hawk nest on the site, which will be removed by the project but loss of the nest tree will be mitigated under the plan by the acquisition, enhancement and permanent management of a 200-acre Swainson's hawk nest tree reserve. The reserve will provide nest tree and foraging opportunities for the hawk in a permanently protected area in contrast to the lesser benefits of preserving the single nest tree on-site, uninsulated from the impacts of urban development on all sides

It is anticipated that all landowners who are members of the Metro Air Park Association will participate in the MAP HCP in order to mitigate the direct, indirect, and cumulative effects of development on the covered species and their habitat and to receive the protection of the incidental take permit. Currently landowners representing over 95% of the lands in the project are members of MAP POA. An individual landowner or developer may choose from among several specified mechanisms for implementation of mitigation, although it is anticipated that mitigation will primarily occur through the payment of mitigation fees.

MAP POA will pay mitigation fees to the County. The County will in turn forward payments to the NBC. The NBC, under the supervision of the USFWS and CDFG, will independently implement off-site mitigation measures for the MAP POA.

The Natomas Basin Conservancy will be responsible for using MAP mitigation fees for the acquisition, purchase and management of MAP's habitat mitigation lands. As of May 2001, the NBC has acquired and is managing 1,630 acres of habitat mitigation lands for the City of Sacramento. The NBC has also prepared site-specific management plans for all of the seven properties it has acquired. The plans address management activities that will benefit all of the Covered Species, not just the giant garter snake and Swainson's hawk. Similar management plans, approved by the USFWS and CDFG, will be prepared for MAP mitigation lands.

a. Giant Garter Snake

Using MAP funds, the NBC would establish roughly 1,000 acres of habitat reserves. Under the Regional Program, 25% of the reserve land would be maintained as managed marsh and 50% would be maintained in rice production that is grown using Best Management Practices for giant garter snake and other wetland species. Thus, over 750 acres of land would be specifically managed on behalf of the Metro Air Park project to benefit the giant garter snake. The establishment of suitable giant garter snake habitat would offset the impact of the loss of between 28 to 76 acres of canal and ditch habitat on-site that may support giant garter snake.

Under the site-specific management plans prepared for the seven properties that have been acquired by the NBC for the City of Sacramento, the preliminary habitat restoration designs for the 428 acres of giant garter snake are for managed marsh, including a combination of open water, perennial marsh, pothole, and seasonal marsh. Not included in that acreage are grasslands surrounding or interspersed with the aquatic and wetland habitat which will provide basking sites and/or refugia for giant garter snake.

b. Swainson's Hawk

Using MAP funds, the NBC would establish roughly 1,000 acres of habitat reserves. Under the Regional Program, 25% of the reserve land would be maintained as upland habitat for use by Swainson's hawk. In accordance with this program, 250 acres of MAP mitigation land would be specifically managed for Swainson's hawk. The NBC would manage the land both as foraging habitat and will install trees that are favored by the Swainson's hawk for nesting (willows, cottonwoods, valley oaks). Because the mitigation land would be managed specifically for Swainson's hawk, it would off-set the impact of the loss of agricultural land on the MAP site which, today, is not specifically managed for Swainson's hawk use, but which occasionally becomes moderate quality foraging habitat as a result of specific farming practices (primarily the rotation of crop land to fallow land).

On the existing NBC mitigation lands, dedicated Swainson's hawk habitat comprises grassland, berms, alfalfa, and riparian woodland and totals 468 acres, or 29 percent of the habitat mitigation lands. Of the 724 acres of rice lands, at least 10 percent will be managed as rotating fallow land on an annual basis to provide foraging habitat for Swainson's hawks. Refer to the NBC's Site Specific Management Plan for more details.

In order to mitigate for the loss of the single Swainson's hawk nest tree on-site, MAP POA will implement the following measures, consistent with the biological goals and objectives of the HCP. The mitigation will be implemented commensurate with the impact and will be funded sufficiently to manage the site.

(1) MAP POA will secure, or provide funds to the NBC to secure 200 contiguous acres of suitable Swainson's hawk habitat via fee title or conservation easement and transfer ownership of the lands over to the NBC to manage in perpetuity for the benefit of Swainson's hawk nesting. MAP POA will also provide sufficient funding to the NBC for management of the nest tree mitigation lands consistent with the following mitigation measures.

The nest tree mitigation lands will be secured consistent with recommendations made by the Swainson's Hawk Technical Advisory Committee (SHTAC) in the 2000 Natomas Basin Swainson's Hawk Nest Survey Report. Acquisition of the lands must be reviewed and approved by USFWS, CDFG, and NBC. The SHTAC recommends establishing new nest territories in the Basin. Lands must be located entirely within the Natomas Basin in the Swainson's hawk "zone" (within one mile of the Sacramento River), or in the eastern portion of the Natomas Basin, including, but not limited to, areas near the levees and Natomas East Main Drain. Acquisition will focus on sites that provide upland foraging habitat, have potential for additional acquisition of adjoining properties, and are surrounded by agricultural lands. A Site Specific Management Plan (SSMP) shall be prepared for the reserve in accordance with NBC's policies regarding the preparation of SSMPs, except that the Swainson's hawk nest tree reserve plan must be completed

within 12 months of the date the lands are transferred to the NBC rather than the standard 18 months for other SSMPs.

(a) The nest tree mitigation lands shall be planted with a minimum of fifteen (15) trees. The planted trees will be native species, and priority shall be given to the planting of valley oak. Other native species may be planted depending upon site characteristics and probability of survival. Other tree species that may be planted are black walnut, Fremont cottonwood, and willow.

As part of its Restoration/Enhancement and Monitoring fees, MAP POA shall provide funding sufficient to cover the cost of purchasing, planting and monitoring the success of replacement trees for a period of three (3) years and to plant additional replacement trees at the rate of one (1) additional replacement tree for every replacement tree lost prior to the end of the three (3) year monitoring period. Trees planted to replace trees lost, shall be monitored for an additional three (3) year period to ensure survival until the end of the monitoring period or they will be replaced.

(2) The 200-acre contiguous lands will provide for foraging habitat in close association with the nest tree(s). The lands will be managed to provide optimum breeding Swainson's hawk foraging opportunities. A priority for management shall be dry-land pasture or alfalfa which typically provide the highest prey abundance and accessibility. A blend of dry-land pasture, alfalfa, disced fields, or fallow fields (March-September) may also be used to increase habitat diversity.

The mitigation requirement for the 200-acre Swainson's hawk reserve is based on the hawks use of core-habitat-use areas, which have been shown to range from 65 to 200 acres and that could support a breeding pair of Swainson's hawk.

c. Burrowing Owl

Using MAP funds, the NBC would establish roughly 1000 acres of habitat reserves. Under the Regional Program, 25% of the reserve land (250 acres) would be maintained as upland habitat, potentially suitable for the burrowing owl, and 50% of the land (500 acres) would be maintained in rice production with the associated canal and ditches needed to move water on and off the rice fields. The canal banks associated with rice production will be managed by the NBC to benefit the burrowing owl. In 1999, the NBC established as one of the City of Sacramento mitigation reserves an area "that is probably home to the largest concentration of burrowing owls in the Natomas Basin" (NBC, 2000). The establishment of more than 750 acres of nesting and foraging habitat suitable for the burrowing owl would off-set the impact of the loss of the 28 to 76 acres of canal and ditch bank habitat and adjacent foraging habitat that currently exists on the MAP site. In addition, the 200-acre Swainson's hawk nest tree mitigation site is expected to also support habitat suitable for this species.

d. Loggerhead Shrike

Using MAP funds, the NBC would establish roughly 1000 acres of habitat reserves. Under the Regional Program, 25% of the reserve land (250 acres) would be maintained as upland habitat, potentially suitable for the burrowing owl, and 50% of the land (500 acres) would be

maintained in rice production with the associated canal and ditches needed to move water on and off the rice fields. The canal banks associated with rice production will be managed by the NBC to benefit the loggerhead shrike. In 1999, the NBC established as one of the City of Sacramento mitigation reserves an area "that is probably home to the largest concentration of burrowing owls in the Natomas Basin" (NBC, 2000). The establishment of more than 750 acres of nesting and foraging habitat suitable for the loggerhead shrike would off-set the impact of the loss of the 28 to 76 acres of canal and ditch bank habitat and adjacent foraging habitat that currently exists on the MAP site. In addition, the 200-acre Swainson's hawk nest tree mitigation site is expected to also support habitat suitable for this species.

e. Tricolored Blackbird

Using MAP funds, the NBC would establish roughly 1000 acres of habitat reserves. Under the Regional Program, 25% of the reserve land (250 acres) would be maintained as managed marsh which would contain habitat suitable for the tricolored blackbird. The NBC would manage the land to benefit the tricolored blackbird. In 1999, the NBC established a reserve that contained habitat that was occupied by over 500 tricolored blackbirds at the time of purchase (NBC, 2000). The establishment of more than 250 acres of habitat suitable for the ricolored blackbird under the MAP HCP would offset the impact of the loss of the 5 acres of riparian scrub-shrub that currently exists on the MAP site. In addition, the 200-acre Swainson's hawk nest tree mitigation site is expected to also support habitat suitable for this species.

f. Northwestern Pond Turtle

Using MAP funds, the NBC would establish roughly 1000 acres of habitat reserves. Under the Regional Program, 25% of the reserve land would be maintained as managed marsh which would be suitable for the pond turtle. In accordance with this program, 250 acres of MAP mitigation land would be specifically suitable for the pond turtle. In addition, 50% of the required mitigation land would be maintained in rice production. The canals and ditches associated with rice is favorable habitat for the pond turtle. The NBC would manage the land to benefit the giant garter snake, which have similar habitat requirements as the pond turtle. Such establishment of more than 250 acres of habitat suitable for the pond turtle would offset the impact of the loss of 76 acres of canal and ditch habitat that currently exists on the MAP site.

g. Aleutian Canada Goose, White-faced Ibis, Bank Swallow, Peregrine Falcon, Greater Sandhill Crane, Valley Elderberry Longhorn Beetle, Delta Tule Pea, and Sanford's Arrowhead

It is expected that take levels or occurrences of take will be zero or extremely rare for these species, and that the adverse effects of such take will be minor or insignificant because the species are not known to occur in the MAP HCP area except as very infrequent visitors, or are not expected to be harmed by the Covered Activities. Furthermore, should the sandhill crane and/or the peregrine falcon be found on the MAP site, any off-site infrastructure sites, or on MAP mitigation lands, no take is authorized as they are State fully protected species. Any project related activities must cease until either species has vacated the site and/or the California Department of Fish and Game has been consulted and allows work to proceed.

The project could result in beneficial impacts to these unconfirmed species as large tracts

of habitat reserves become established in the future.

Under the HCP, adverse effects to covered species and their habitat associated with development of the MAP project will be mitigated by participation in the Natomas Basin regional mitigation program. The regional plan sets forth a program to mitigate the loss of Covered Species habitat values through long-term protection, creation, and enhancement of upland and wetland habitats under Basin-wide reserve system. Establishment of habitat reserves will provide for the protection of wetland and upland habitats as well as the plant and animal communities they support.

The MAP HCP requires participation in this regional plan, primarily by payment of mitigation fees on a per acre basis upon the cessation of farming and/or on the urbanization of the project site. Under this program, habitat reserves will be established with these fees as urbanization occurs which will offset impacts of the loss of agricultural land uses.

Through the Natomas Basin Conservancy (NBC), the Metro Air Park project will fund the establishment and management of over 1,000 acres of permanent habitat reserves, which, under the current acquisition strategy of the NBC, are expected to comprise 25% managed marsh habitat (250 acres), 50% managed rice fields (500 acres), and 25% upland habitat (250 acres). In addition, the 200-acre Swainson's hawk nest tree mitigation site is expected to also provide habitat suitable for these species.

The NBC's Site Specific Management Plans (SSMPs), which are required to be developed under the NBHCP and MAP HCP for all reserves, will incorporate management activities beneficial for all the Covered Species. For example, the NBC is using grazing to enhance grassland habitat at the Betts-Kismat-Silva property. Grazing benefits burrowing owls which require short grass in which to forage. Managed marsh habitat will be managed to provide habitat for white-faced ibis, tricolored blackbird, northwestern pond turtle, and Sanford's arrowhead.

Metro Air Park's participation in the regional plan through the NBC's programs will incrementally increase the area of large-block habitat reserves created for the benefit of covered species. Large block reserves are preferred over small isolated reserves because they are better able to sustain adequate population sizes, provide large areas of secure land for movement between species populations, typically provide a higher diversity of habitat types, and they minimize edge impacts of roads and adjacent developed areas.

2. Take Avoidance and Minimization Measures

All take avoidance and minimization measures are in addition to the 0.5:1 mitigation requirement of the HCP.

a. Pre-construction Surveys

Prior to commencement of construction activities on development sites in the Metro Air Park Plan area, a pre-construction survey of the site shall be conducted to determine the status and presence of, and likely impacts to, all covered species on the site. MAP POA will be responsible for contracting with USFWS-approved qualified biological consultants to carry out

the pre-construction surveys, and as necessary, to implement specific take minimization measures that have been approved by the wildlife agencies. MAP POA will provide landowners with educational materials pertaining to Covered Species, such as species descriptions, photos, habitat requirements, habits, who to call in the event a animal is found, etc.

The results of the pre-construction surveys along with recommended take minimization measures shall be documented in a report and shall be submitted to the USFWS and CDFG. Based upon the survey results, the USFWS and CDFG will approve applicable take avoidance and other site-specific mitigation measures to be carried out on the site. The pre-construction survey documents and list of take avoidance measures will be submitted to the County and/or MAP POA to prove compliance with the MAP HCP.

Reconnaissance level surveys will be conducted first to determine what habitats are present on a specific development site and what, if any, more intensive survey activities must be conducted to accurately determine the status of the Covered Species on the site. It shall be the responsibility of the MAP POA to ensure that such surveys are properly completed by member developers/landowners. Surveys shall be conducted by qualified personnel (e.g., persons with suitable biological, botanical, or related expertise). Note: negative survey results for the giant garter snake do not remove the need to carry out minimization measures if giant garter snake habitat is found on-site.

b. Measures to Reduce Take on Giant Garter Snake

Urban development within the Metro Air Park project site will displace giant garter snake habitat (e.g., irrigation ditches and drains), and may directly kill or injure individual garter snakes. Giant garter snakes may be killed or injured through vehicle strikes on roads, crushing beneath heavy construction equipment, or entombment in their winter retreats. Giant garter snakes that escape initial destruction in construction areas may also be killed or injured because of disorientation or lack of suitable cover resulting in starvation or predation. Non-construction related operations and maintenance activities by the water agencies may have similar effects on the giant garter snake. However, the following discussion and methods establishes the MAP HCP's take avoidance strategy for giant garter snakes, recognizing that some such measures could be modified under the Regional Plan's Adaptive Management provisions.

If the pre-construction surveys find that suitable habitat for the giant garter snake is present on a development site, then the minimization measures contained in Appendix B shall be followed.

c. Measures to Reduce Take on Swainson's Hawk

In order to minimize the impact of disturbance to active Swainson's hawk nest sites, on and off-site, MAP POA will implement the following measures, consistent with the biological goals and objectives for the HCP:

1. Pre-Construction Surveys: Every year, prior to the commencement of development activities at any development site within the MAP covered lands, a pre-construction survey shall be completed to determine whether any Swainson's hawk nest tress will be removed on-site, or active Swainson's hawk nest sites occur on or within ½ mile of the

MAP covered lands development site. These surveys shall be conducted according to the Swainson's Hawk Technical Advisory Committees (May 31, 2000) methodology (attached as Appendix E) or updated methodologies, as approved by the USFWS and CDFG, using experienced Swainson's hawk surveyors.

2. Active Nest Tree: If an active Swainson's hawk nest is identified, no new disturbances (e.g., heavy equipment operation associated with construction) will occur within ½ mile of an active nest between March 15 and September 15. If the active nest site is located within 1/4 mile of existing urban development, the no new disturbance zone can be limited to the 1/4 mile versus ½ mile. Routine on-going disturbances such as agricultural activities, commuter traffic, and routine facility maintenance activities within ½ mile of an active nest are not restricted.
3. Nest Tree Removal: If an active nest nest tree(s) (any tree that has an active nest in the year the impact is to occur) must be removed, tree removal should only occur between October 1 and February 1 during the non-nesting season, or after baby birds have fledged.

d. Measures to Reduce Take on Valley Elderberry Long-horn Beetle

The conservation strategy for the valley elderberry long-horn beetle (VELB) under the MAP HCP will follow the USFWS's "Conservation Guidelines for the Valley Elderberry Long-horn Beetle," dated July 9, 1999 (attached as Appendix F). These guidelines assume that any elderberry bushes found within the range of the species are likely to provide beetle habitat, and any destruction or loss of such elderberry shrub habitat must be mitigated for according to the Guidelines. The principle conditions of the Guidelines are summarized below. VELB Guidelines, or any revision or successor to the Guidelines approved by the USFWS, are hereby incorporated as terms and conditions of the MAP HCP.

(1) Impacts to VELB habitat will be avoided whenever possible. This is best done by establishing a 100-foot buffer around elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level. In areas where encroachment on the 100-foot buffer has been approved, provide a minimum setback of at least 20 feet from the dripline of each elderberry plant.

(2) Post warning signs around the protected plants and hold a pre-construction conference with workers to inform them of the need to protect the plants and the penalties for disturbing the plants.

(3) If elderberry plants cannot be avoided, they should be transplanted during the dormant season (November 1 to February 15) to an area protected in perpetuity and approved by the USFWS. Replacement seedling plants will be provided at a ratio of 1:1 to 8:1 (new planting to affected stems) as determined to be appropriate by the USFWS on a case-by-case basis.

Thus, where feasible, stands of elderberry bushes found in the Natomas Basin will be avoided and protected from development, and, where avoidance is not feasible, will be moved and mitigated for within approved managed reserves. To ensure this process is completed, biological surveys will be conducted prior to the commencement of development activities, as described in Section C. 4 below, and the results of such surveys will be reported to the affected

jurisdiction and the NBC. If VELB or elderberry bushes are found, the Conservation Guidelines will be implemented. Compliance with the VELB Guidelines shall be required in addition to compliance with the generally approved 0.5:1 mitigation requirements. The NBC will also, in its annual report, report the number of elderberry bushes affected and moved or otherwise mitigated for during the year in question (see Section G. 4 below).

e. Measures to Reduce Take on Tricolored Blackbird

The tricolored blackbird nests in wetland habitat with suitable vegetation (e.g., tules or blackberries) and forages on the ground in grasslands, rice fields, and other croplands. It will benefit from the managed marsh and upland habitats established under the Regional Plan. Disturbance to tricolored blackbird nesting colonies will be strictly avoided within the nesting season (April to July or while birds are present) during NBC management activities undertaken in wetland and upland reserve areas, unless otherwise approved by the USFWS and CDFG. Disturbance to nesting colonies will also be avoided, to the extent practicable, within the nesting season during all development activities conducted in the Basin. Based on these take avoidance measures, take of the tricolored blackbird in the plan area is expected to be rare to infrequent during the life of the permits.

f. Measures to Reduce Take on Aleutian Canada Goose

The Aleutian Canada goose winters in areas both north and south of the Natomas Basin and are expected to be only an occasional winter visitor in the Plan area. It grazes in marshes and grain crops (e.g., stubble fields) and roosts on the water. If and when the species periodically inhabits the Basin, it will benefit from the managed marsh and rice field habitats established by the NBC. In addition, the NBC is directed to utilize applicable USFWS approved Aleutian Canada goose recovery or management plans, and the Adaptive Management provisions described in Section E below, to implement any additional conservation measures deemed appropriate should use of the plan area by this species increase at any time in the future. In any case, conflicts between the Aleutian Canada goose and development activities in the Natomas Basin are expected to be minor--e.g., periodic, potential disturbance when winter stubble fields are prepared for construction projects. Therefore, little to no direct mortality of this species is expected to occur during the life of the permits.

g. Measures to Reduce Take on White-faced Ibis

The white-faced ibis forages in flooded rice fields, pastures, and emergent wetlands and nests in dense emergent wetlands. Though not currently known to inhabit the plan area (or at least to nest there), if and when such use occurs it will benefit from the managed marsh and rice field habitats established by the NBC. In addition, the NBC is directed to utilize applicable USFWS approved white-faced ibis recovery or management plans, and the Adaptive Management provisions described in Section E below, to implement any additional conservation measures deemed appropriate should use of the plan area by this species increase at any time in the future. Also, disturbance to any white-faced ibis nesting colonies will be strictly avoided within the ibis nesting season (April 1 to August 15, or while birds are present) during NBC reserve management activities, unless otherwise approved by the USFWS and CDFG. Disturbance to nesting colonies will also be avoided, to the maximum extent practicable, within the nesting season during all development activities conducted in the Basin. Based on these

measures, and because the white-faced ibis is only a rare visitor to the Basin, little to no direct mortality of this species is expected to occur during the life of the permits.

h. Measures to Reduce Take on American Peregrine Falcon

The peregrine falcon winters in the Sacramento Valley and preys on other avian species in and around wetland habitats. It will benefit from the birds attracted to the wetland and other habitats established by the NBC. Because the peregrine falcon is only a winter visitor in the Natomas Basin, does not nest in the Basin, and is highly mobile, no direct mortality of peregrine falcons in the Basin is expected to occur during the life of the permits. Furthermore, should the peregrine falcon be found on the MAP site, any off-site infrastructure sites, or on MAP mitigation lands, no take is authorized as they are State fully protected species. Any project related activities must cease until the falcon has vacated the site and/or the California Department of Fish and Game has been consulted.

i. Measures to Reduce Take on Loggerhead Shrike

The loggerhead shrike prefers open habitats with scattered shrubs, trees, fences, posts, or other perches. It will benefit from upland habitats established in association with wetland giant garter snake habitats. Upland reserve areas established for the Swainson's hawk under the Plan, including riparian areas adjacent to croplands, will also benefit this species. In addition, the NBC shall to the maximum extent practicable encourage and maintain loggerhead shrike perching and nesting sites on all Conservancy reserve lands, and shall avoid disturbance to loggerhead shrike nest sites during reserve management and enhancement activities to the maximum extent practicable. Because shrikes are relatively uncommon in Natomas Basin and are highly mobile, and based on the above take avoidance measures, little to no direct mortality of loggerhead shrikes in the Basin is expected during the life of the permits.

j. Measures to Reduce Take on Bank Swallow

The bank swallow nests in colonies composed of burrows excavated in the sides of riverbanks and forages for insects along riparian areas and over riverine habitats. No bank swallow nesting colonies are currently recorded in the MAP HCP plan area; however, the species does nest to the north along the Sacramento and Feather Rivers and may occur in the plan area over the life of Plan. Consequently it may benefit from any riparian habitats protected or created under the regional mitigation program, which it could use for nesting or foraging. In addition, the NBC is directed to utilize applicable USFWS or CDFG approved bank swallow recovery or management plans, and the Adaptive Management provisions described in Section E below, to implement any additional conservation measures deemed appropriate should use of the plan area by this species increase at any time in the future. Also, disturbance to bank swallow nesting colonies will be strictly avoided within the nesting season (March 15 to July 31, or while birds are present) during NBC reserve management activities, unless otherwise approved by the USFWS and CDFG. Disturbance to nesting colonies will also be avoided, to the maximum extent practicable, within the nesting season during all development activities conducted in the Basin. Take of bank swallows in Natomas Basin is expected to be rare to infrequent during the life of the permits.

k. Measures to Reduce Take on Greater Sandhill Crane

The sandhill crane forages in emergent wetlands, grasslands, and moist croplands with rice or corn stubble. Though these cranes do not currently inhabit the Natomas Basin, nearby wintering grounds include the Sacramento-San Joaquin Delta and the Consumnes River area to the south and Butte Sink area to the north. These areas are subject to a variety of development pressures, which may result in shifting sandhill crane use of the Central Valley and, possibly, in crane use of the MAP HCP plan area. If this occurs, the sandhill crane will benefit from managed marsh and rice field habitats established by the NBC, and potentially from upland reserve habitats. In addition, the NBC is directed to utilize applicable USFWS approved greater sandhill crane recovery or management plans, and the Adaptive Management provisions described in Section E below to implement any additional conservation measures deemed appropriate should use of the plan area by this species increase at any time in the future. Because these birds only winter in the vicinity of the Basin, are highly mobile, and are expected to have few direct conflicts with development activities, little to no take of this species in the Basin is expected during the life of the permits. Furthermore, should the greater sandhill crane be found on the MAP site, any off-site infrastructure sites, or on MAP mitigation lands, no take is authorized as they are State fully protected species. Any project related activities must cease until the greater sandhill crane has vacated the site and/or the California Department of Fish and Game has been consulted.

l. Measures to Reduce Take on Burrowing Owl

The burrowing owl prefers open, dry grassland and desert habitats and uses rodent or other burrows for roosting and nesting. It will benefit from the upland reserves established under the Plan as well as upland habitats established in association with the wetland reserves. In addition, the NBC will, to the maximum extent practicable, avoid disturbance to active burrowing owl nesting burrows during reserve management activities. These and other mitigation measures are described in the CDFG's October 17, 1995, Staff Report on Burrowing Owl Mitigation. The mitigation guidelines in that document or its successor should be followed in consultation with CDFG. Based on these measures, take of burrowing owls in the Plan area is expected to be infrequent to rare during the life of the permits.

m. Measures to Reduce Take on Northwestern Pond Turtle

The northwestern pond turtle is widely distributed in and around permanent and nearly permanent aquatic habitats in northern California. Habitat requirements include slack or slow-moving water, basking sites, and upland sites for nesting. Low numbers of northwestern pond turtles inhabit the aquatic habitats of the Natomas Basin, including the canals and ditches of the water conveyance system. Pond turtles will benefit from the managed marsh and rice field habitats established under regional mitigation program. In addition, the NBC is directed to consult with northwestern pond turtle researchers and experts periodically during implementation of the Regional Plan to determine what, if any, conservation opportunities for this species might exist within the Regional Plan's proposed reserve system. Such opportunities might include, but are not limited to, provision of suitable upland habitat for nesting (e.g., unshaded slopes), plentiful basking sites (e.g., floating snags), and shallow water with dense emergent and submergent vegetation for juveniles. With such management focused on the species' habitat

needs, the NBCs reserve system could support western pond turtle populations in excess of current levels, potentially resulting in an overall improvement of their status in the plan area. Take of the northwestern pond turtle could occur under the MAP HCP as a result of habitat destruction during construction activities, including the removal of irrigation ditches and drains, and during ditches and drain maintenance. However, such take will be minimized by the dewatering requirement described for giant garter snake above and is therefore expected to be at relatively minor levels.

n. Measures to Reduce Take on Delta Tule Pea and Sanford's Arrowhead

Two covered plants (delta tule pea and Sanford's arrowhead) occur primarily in other types of marshes or riparian habitats. The delta tule pea occurs in freshwater and brackish marshes and the Sanford's arrowhead occurs in freshwater marsh and emergent wetland habitats. Though not currently recorded within the MAP plan area, should they later be discovered these species would benefit under the Regional Plan through establishment of managed marsh wetland and upland habitats in the Regional Plan's reserve system and continued operation of the Basin's water conveyance system. In addition, the NBC is directed to evaluate the potential for furthering the conservation of these plant species within its reserve system through appropriate means, including but not limited to, introduction of these plants into suitable locations in the Natomas Basin. Such introduction could be accomplished through seeding or vegetative propagation in appropriate wetland habitat.

Monitoring of Plant Populations. The NBC is also directed to monitor any known populations of covered plant species within its reserve system and to survey for additional populations of covered plants, as appropriate, in accordance with the Biological Monitoring program described in Appendix A. Also the NBC is directed to report any new occurrences of these plants to the NDDB.

3. Special Provisions for Off-Site Infrastructure Improvements

The general location of off-site drainage, sewer, and roadway improvements are shown in Figure 4 of the HCP. The off-site improvements will disturb approximately 123 acres of land, most of which is currently in agricultural uses. All of the pre-construction survey and take avoidance and mitigation measures described above for on-site development applies to development of the off-site improvements. In addition, MAPPOA will conduct site-specific surveys including biological surveys on MAP's off-site infrastructure improvement projects as described above (Section I. C. 3). During the construction of off-site infrastructure projects, all habitat for listed vernal pool crustaceans will be avoided. All construction impacts (temporary or permanent), including direct and indirect effects, must be kept at a minimum of 250 feet from all vernal pool crustacean habitat and not affect the hydrology of the habitat.

4. Rice Farming Best Management Practices

MAP POA landowners, and their lessees, who elect coverage under the permit and may in the future engage in rice farming shall employ Best Management Practices (BMPs) to maximize giant garter snake compatibility. This includes maintenance of rice checks, berms, or other water control structures in as natural a state as practicable by limiting mowing or herbicide treatment, maintenance of garter snake prey species (e.g. mosquito fish) in or near rice fields

through appropriate management, and other measures as appropriate.

However, even though rice farming is assumed to be compatible with management of habitat for the covered species, the BMPs will be reviewed by the USFWS each year and may be modified in the future. The USFWS will notify landowners and lessees covered by the permits for rice farming activities of any modifications to BMPs for the next agricultural season. The current version of BMP's for rice farming are contained in Appendix C.

D. Permit Term and Mitigation Phasing, Accounting and Reporting

1. Term of Permits

The Section 10(a)(1)(B) and Section 2081 permits are requested for and, unless terminated sooner in accordance with governing law and regulations, will be in effect for fifty years but will last only as long as MAP POA is in existence if less than fifty years. Renewal of the permits beyond the 50-year term shall be governed by the law and regulations then in effect.

2. Phasing of Mitigation with Respect to Development

Prior to commencing any infrastructure or other development on the MAP site or on any of the off-site infrastructure lands, MAP POA shall secure, or provide funds to the NBC to secure 200 contiguous acres, in perpetuity, via fee title or conservation easement that are acceptable Swainson's hawk nest tree and foraging habitat as determined by USFWS and CDFG. The reserve lands shall be transferred to NBC for permanent management and protection. Prior to such development MAP POA shall also deposit with NBC funds in an amount sufficient, as determined by NBC to permanently manage such lands.

The MAP HCP will ensure that habitat acquisition will be provided in step with habitat conversion resulting from urban development on MAP covered lands. Within one year after Habitat Acquisition Fees (HAFs) are received, the NBC shall acquire the amount of habitat mitigation lands represented by such HAFs. Acquisitions of habitat mitigation lands shall be in accordance with the NBHCP and NBIA provided that the 400-acre minimum block and 2,500-acre minimum block requirements shall be applied in the aggregate to all approved HCPs in the Natomas Basin that are based on the NBHCP, so that the plans as a whole must achieve the identified habitat block acquisition requirements. Notwithstanding the above, in the event that the NBHCP is not in effect, MAP POA retains the independent obligation to acquire a minimum of two 400-acre habitat blocks as defined in the NBHCP but is not required independently to meet the 2,500-acre minimum habitat block requirement. The one year time period may be extended by the mutual agreement in writing of the USFWS, CDFG and NBC as needed to optimize land acquisition opportunities.

MAPPOA will meet a minimum of twenty-five percent (25%) (approximately 250 acres) of its Habitat Mitigation Land (HML) requirements within Sacramento County. Acquisition of 25% HML land within Sacramento County shall commence upon either the fifth (5th) anniversary of the completion date of the Tier One infrastructure or at the time of thirty-three percent (33%) build out of the developable lands within the MAP SPA, whichever comes first. The 25% Sacramento County land acquisition requirement shall be completed at the time of seventy-five percent (75%) build out of the developable lands within the MAP SPA. At the time the 25%

HML acquisition requirement goes into effect, the NBC shall recalculate MAP HCP fees, if necessary, in order to cover the costs of land acquisition within Sacramento County.

Once grading permits have been issued for 90% of the MAP POA lands and prior to the issuance of grading permits for the last 10% of MAP POA lands, MAP POA shall provide written evidence to the USFWS and CDFG that mitigation lands representing mitigation for the last 10% have been acquired by the NBC.

3. Accounting of Mitigation Land

The MAP HCP mitigates for urban development in the Natomas Basin area by providing for the establishment of a reserve system composed of wetland and upland habitats, managed marshes, and rice lands, and composed of mitigation lands located inside the Basin, unless out-of-Basin mitigation is approved in writing by the USFWS and CDFG. It also includes measures to insure that mitigation lands are acquired in a timely fashion as described above, and requires the maintenance of a 0.5-to-1 mitigation ratio.

A key requirement is that at least 25 percent of habitat mitigation lands be established as managed marsh, unless the USFWS requires more based on its future Giant Garter Snake Recovery Plan. Thus, the NBC will, in its annual report specify the acreage, location, and type of reserve land (i.e., rice land versus marsh), and the percentage of each with respect to the total for all lands acquired to date and proposed for acquisition. This accounting by the NBC is to be kept separately for the City of Sacramento and for Metro Air Park since the mitigation program is severable with respect to the each permittee. Note that no Habitat Mitigation Lands in "Area C" as defined in the 1997 NBHCP, may be acquired for the MAP project.

The accounting for MAP POA will show:

- (1) Take: The annual incremental and cumulative area converted to urban development in the permit area.
- (2) Mitigation: The annual incremental and cumulative area of mitigation lands acquired:
 - a. In-Basin:
 - i. Lands managed as marsh.
 - ii. Lands managed as rice, including associated fallow land.
 - iii. Lands managed as upland reserves.
 - b. Out-of-Basin in Area "B."
 - c. Status of the initial 400 acres (when purchased and what habitat type).
- (3) Financial status:
 - a. The amount and source of funds collected.
 - b. Funds expended or committed for acquisition.
 - c. Funds held in reserve.
 - d. Summary of expenditures for and revenues from reserve land management.
 - e. An accounting of the long-term endowment account.

The total acreage of all mitigation lands acquired must equal or exceed one-half of the

total acreage of development (a 0.5:1 ratio), and must meet these criteria:

- (1) A minimum of 25 % of wetland mitigation land is to be managed marsh, unless otherwise revised as a result of the Giant Garter Snake Recovery Plan.
- (2) A maximum of twenty percent (20%) of mitigation lands may be in Area "B," after an initial, 800-acre in-Basin purchase, provided USFWS agrees in writing to the acquisition of such out of basin lands in accordance with the terms of the NBHCP and MAP HCP.
- (3) Accounting must show status of the acquisition of the contiguous 200-acre Swainson's hawk nest tree reserve.
- (4) Accounting must show fee payments and land acquisitions necessary to meet the 25% Sacramento County land requirement.

4. Reporting

Under the Regional Plan, the NBC is required to compile and submit an annual report to the USFWS and CDFG detailing urban development activities and habitat acquisition, management, and monitoring activities throughout the Regional Plan area for the preceding year. The report is due 60 calendar days from the last day of each calendar year, or portion of a calendar year, during which the permits will be in effect.

During the construction season (May 1 to September 30), MAP POA will provide the NBC with monthly accounts of the numbers of acres under development and the amount of mitigation fees paid to the County. MAP POA will also provide the NBC, County, CDFG, and USFWS with an annual accounting of the number of acres under urban development, mitigation fees paid, and the number of rice farming acres, if any, under Certificates of Inclusion. NBC will include the MAP information in the annual report required under the Regional Plan.

See Section 5 of the Metro Air Park Implementation Agreement for further information on reporting requirements within the MAP permit area.

E. Adaptive Management

1. General Information

The HCP recognizes that uncertainties exist in the Plan. The Adaptive Management provisions were designed to address these uncertainties. Adaptive Management is a process that allows the MAP HCP's conservation program and reserve acquisition and management decisions to be adjusted during the life of the permits to ensure that the most up-to-date information available on the covered species is being utilized and that the conservation program is as effective as possible.

Any of the following entities may propose revisions to the MAP HCP based on the Adaptive Management provisions: (1) any permittee; (2) the Plan Operator (Natomas Basin Conservancy, or NBC); (3) the NBC Technical Advisory Committee; (4) the USFWS; (5) or CDFG. See Appendix A for further discussion of adaptive management.

MAP POA and NBC acknowledge that the NBHCP may be modified in the future and agree that any modifications to the Adaptive Management or relevant program review provisions of the NBHCP shall be deemed automatically incorporated into the MAPHCP and further agree to abide by and implement, all such provisions as those provisions may be modified from time to time.

2. MAP HCP Program Review at 800 Acres of Development

The MAP HCP establishes a program review designed to evaluate the performance and effectiveness of the Plan, to be initiated when Urban Development in the MAP SPA has reached 800 acres. This program review will be triggered at the point that 800 acres of the MAP's undeveloped lands have been converted to urban uses (e.g., issued grading permits). During the time the review is being undertaken, up to, but not more than a total of 200 additional acres may be developed in MAP. In other words, no more than a total of 1,000 acres of land shall have been urbanized prior to completion of the program review and re-certification of the MAP HCP or amendment of its associated permits, as appropriate.

F. Changed and Unforeseen Circumstances - "No Surprises Rule"

On February 28, 1998, the U.S. Fish and Wildlife Service and National Marine Fisheries Service published a final rule codifying "No Surprises" into federal regulation at 50 C.F.R. Sections 17.22(b)(5) and 17.32(b)(5). The "No Surprises" regulations state, in part, that, "In negotiating unforeseen circumstances, the [USFWS] Director will not require the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed upon for the species covered by the conservation plan without the consent of the permittee. If additional conservation and mitigation measures are deemed necessary to respond to unforeseen circumstances, the Director may require additional measures of the permittee where the conservation plan is being properly implemented, but only if such measures are limited to modifications within the conserved habitat areas, if any, or to the conservation plan's operating conservation program for the affected species, and maintain the original terms of the conservation plan to the maximum extent possible. Additional conservation and mitigation measures will not involve the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources, otherwise available for development or use under the original terms of the conservation plan without the consent of the permittee." The regulation also states that the assurances of the No Surprises regulations apply only "where the conservation plan is being properly implemented, and apply only with respect to species adequately covered by the conservation plan."

Thus, in the event that unforeseen circumstances adversely affecting any of the Metro Air Park HCP's Covered Species occur within the life of the plan, and assuming the plan is being implemented properly, the permittee would not be required by the USFWS to commit additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed upon in the HCP for the Covered Species without its consent.

Another category of circumstances is "changed circumstances". This term is defined by

the regulations as "changes in circumstances affecting a species or geographic area covered by a conservation plan that can reasonably be anticipated by plan developers and the [USFWS] and that can be planned for (e.g., the listing of a new species, or a fire or other natural catastrophic event in areas prone to such events.)"

For purposes of the "No Surprises" assurances, the term "operating conservation program" shall mean the conservation, mitigation, and management measures provided for under the MAP HCP to minimize and mitigate the impacts of incidental take of the Covered Species. The operating conservation program is described in the MAP HCP in Chapter III.

5. Listing of New Species

Changed Circumstances. If currently unlisted species that are addressed in the HCP as Covered Species are listed subsequent to issuance of the HCP's associated Section 10(a)(1)(B) permit, no action is required of the permittees. This is because all Covered Species are named on the federal permit and, under the terms of the permit, permit coverage for any unlisted Covered Species will become effective upon the final listing of any such species under the ESA. However, currently unlisted species that are not addressed as Covered Species in the HCP will not be included in the permit and will not be so treated in the event of listing. To the extent that any such species would likely be taken during the HCP's covered activities or jeopardized or the designated critical habitat, if any, of such species, adversely modified, the permittee agrees to implement the "no jeopardy/no take" measures identified by USFWS pursuant to 6.1.6 (4) of the MAP IA until the HCP and the federal permit are amended to obtain permit coverage for these species or until the USFWS notifies the Permittee that such measures are no longer needed to avoid jeopardy to, take of, or adverse modification of the critical habitat of, the non-covered species.

Unforeseen Circumstances. There are no unforeseen circumstances associated with the listing of new species under the ESA.

6. HCP Implementation

Changed Circumstances. Certain types of problems may develop during implementation of the HCP. These could include funding deficiencies, possible lack of effectiveness in some of the Plan's mitigation approaches and lands, deficiencies in certain aspects of the Plan's monitoring program, and problems in coordinating the activities of the participating jurisdictions and in distributing the location of mitigation lands equitably among the several jurisdictions. These types of changed circumstances will be addressed under the MAP Plan's midterm program review, at regular NBC TAC meetings, and the year end meeting between the wildlife agencies and permittees, including the MAP POA. MAP POA shall be responsible for levying assessments against each property owner as necessary, unless funded by another source, to provide any additional funding necessary to address any problems that may effect implementation of the MAP HCP and that have not been addressed elsewhere in the MAP HCP and MAP IA.

Unforeseen Circumstances. There are no unforeseen circumstances associated with the implementation problems of the HCP, as described above.

7. Decreases in Water Delivery Service/Water Delivery Failure to the Lone Tree Canal

At present the Natomas Basin contains a lengthy and complex network of canals and ditches that move agricultural irrigation water on and off the vast acreage of agricultural fields that exist in the Basin. The Natomas Central Mutual Water Company (NCMWC) maintains an extensive system of water delivery facilities, including canals and pumps, that supply and recapture water from fields and uses it over again. The Reclamation District (RD1000) provides for agricultural drainage, flood control, and levee maintenance.

The giant garter snake is known to use water filled canals and ditches to move around the Basin, although major roadways appear to limit movement in certain areas. GGS movement could be impacted in the future if water delivery through this basin wide system is eliminated or decreased significantly. In particular, the Lone Tree Canal that traverses the eastern outside boundary of the Metro Air Park site may be critical to snake movement. This canal which begins at the southeast corner of MAP site and traverses along its eastern boundary up to Elverta Road, is located on the east side of Lone Tree Road, a narrow dirt roadway. Both the NCMWC and RD1000 maintain easements on portions of the Canal.

Changed Circumstances. Listed below are several changes in circumstances that may effect water delivery and/or drainage in the Lone Tree Canal.

1) If land being served by the Lone Tree Canal did not require irrigation water according to the NCMWC, the NCMWC would reduce and/or eliminate the water it supplies to that canal. In an effort to conserve water, NCMWC typically de-waters any portions of canals that are not serving any properties. Additionally under this same situation, the amount of drain water flowing through RD1000's canals would also be decreased. A Changed Circumstances would be triggered if the water level in any canal segment (area between water control structures) drops below an average of 12 inches for more than 48 hours between the months of April and October.

2) The NCMWC holds a contract with the U.S. Bureau of Reclamation. That contract stipulates the amount of water the NCMWC receives and the amount of water that may be allocated. NCMWC's contract with the Bureau expires in 2004. Water deliveries in the Basin may be affected by the contract renegotiations. A Changed Circumstances exists if a new or renegotiated contract with the U.S. Bureau of Reclamation results in decreases in water deliveries or alters that timing of the deliveries such that the water level in any canal segment drops below an average of 12 inches for more than 48 hours between the months of April and October.

3) The NCMWC does not foresee going out of business as a result of the development of the MAP project. However it cannot foresee what may happen if many more of the agricultural fields cease production in the future due to an increase in urbanization within the Basin. If NCMWC failed, all of its canals would revert to individual landowners that own the property. Farming operations that remain would have to rely on groundwater or any residual runoff in the canals for irrigation. A Changed Circumstance exists if individual landowners owners, in all or any portion of the NCMWC service area must rely on groundwater of residual canal runoff and therefore cannot maintain the water level in any canal segment above an average of 12 inches between the months of April and October.

Should water delivery to the Lone Tree canal be compromised resulting in adverse effects

to the Covered Species and their habitats, and/or resulting in expenditures of funds in excess of those required for normal maintenance and management activities on the mitigation lands or facilities, MAP POA shall prepare and fund a report, within 60 days, that explains what effects the water delivery decrease and/or failure has on maintaining water in the Lone Tree Canal. The report, to be submitted to the USFWS and CDFG, shall identify alternative means to maintain water in the canal such that the basic habitat requirements of the protected species are being met. The report shall also address any funding needed to implement such measures. The USFWS and CDFG, in consultation with MAP POA shall determine what measures shall be implemented. The MAP POA shall be responsible for levying assessments against each property owner as necessary to provide any additional funding for implementing such measures, unless MAP POA secures an alternative funding source.

Unforeseen Circumstances. There are no unforeseen circumstances associated with decreased or failure in water delivery to the Lone Tree Canal.

8. Flood and Drought

Natural phenomena such as wildfires, floods and prolonged drought can result in significant adverse consequences to an HCP's covered species and their habitats. The likelihood of such occurrences depends to a large extent on the location of the HCP and the history of such events in a given region. In the MAP HCP plan area, the risk of wildfire affecting Covered Species habitats or mitigation lands is low. This is because the land use types in the area--primarily intensively managed agriculture--would not typically support uncontrolled or extensive wildfire events, compared to chaparral, forest, or similar habitats.

However, there is a significant risk of flood events in Sacramento County, to judge by extensive flooding that occurred in the area in 1986, 1997, and other years. Drought is another phenomenon that is not uncommon in California as evidenced by the recent drought years.

Floods

The effects of floods on the HCP's Covered Species and on mitigation lands established under the Plan would depend on several factors--including the severity of the flood event, its duration, and the type of habitat affected. Overall, the adverse effects of flood events on the HCP's Covered Species and mitigation lands, if they occur, are expected to be relatively minor. This is because habitat mitigation lands established under the HCP--croplands, riparian corridors, wetlands, and some grasslands and woodlands--naturally experience periodic flooding and are capable of absorbing the effects of flooding with minimal or transient damage. It is also because many of the Plan's Covered Species are either adapted to flooding (e.g., the giant garter snake and northwestern pond turtle), would likely not be present or nesting during winter flood events (e.g., Swainson's hawk, burrowing owl), or are capable of fleeing the harm of such events (e.g., white-faced ibis, bank swallow, and northern harrier).

However, in some cases flood damage to HCP mitigation lands could be significant, and could include crop damage, sedimentation, downed trees and shrubs, deposits of debris, and canal blockage and destruction. Therefore, the following conditions shall apply should flooding occur in the HCP plan area during the term of the permit:

Changed Circumstances. If any flooding affects any MAP POA HCP mitigation lands or

facilities in a manner that requires expenditures of funds in excess of those required for normal maintenance and management activities, or a 100 to 200-year flood event occurs, the NBC, in consultation with USFWS's and CDFG's representatives on the Technical Advisory Committee (TAC), shall assess the extent of the damage. The NBC shall submit a report, funded by MAP POA, summarizing the nature and extent of such damage to MAP POA, USFWS, and CDFG within 60 days of the cessation of the flooding. The report shall address any damage to protected habitats on the mitigation lands and any known or suspected impacts to Covered Species occupying such lands.

If damage to mitigation lands is such that corrective action is determined to be needed, as assessed by the NBC and with concurrence of USFWS's and CDFG's representatives on the TAC, the NBC shall, within 30 days of submission of the report described above, consult with MAP POA. Together, the NBC and MAP POA shall develop a plan for implementing any necessary measures to correct for flood damage, which measures shall include, but not be limited to, the removal of sediment or debris, land recontouring, replanting vegetation, and any other measures determined by the NBC, USFWS, and CDFG, in consultation with MAP POA, to be necessary to maintain the affected area's habitat values. The plan shall also address any additional funding beyond the management funds already identified under the Plan needed to implement such measures. The MAP POA shall be responsible for levying assessments against each property owner-as necessary to provide any additional funding to NBC to implement such measures, unless MAP POA secures an alternative funding source.

Unforeseen Circumstances. A flood event greater than the 200-year event has not occurred in the last 100 years for the Sacramento or American Rivers in the vicinity of the Natomas Basin. The potential damage from such an event is not foreseeable, not predicable. Therefore, a flood and the damage resulting from an event greater than a 200-year event shall be considered an Unforeseen Circumstance.

Drought

The effects of drought on the HCP's Covered Species and on mitigation lands established under the Plan would depend on its duration and its impact on water delivery service to the managed wetlands and mitigation lands managed as agriculture.

Changed Circumstances. If a drought affects any MAP POA HCP mitigation lands or facilities in a manner that requires expenditure of funds in excess of those required for normal maintenance and management, puts the maintenance of managed wetlands in jeopardy, or a prolonged drought of more than 3 years but less than 6 years occurs, the NBC, in consultation with USFWS's and CDFG's representatives on the Technical Advisory Committee (TAC), shall assess the extent of the damage. The NBC shall prepare a report, funded by MAP POA, that explains what effects the drought is having on the HCP's Covered Species and mitigation lands. The report, to be submitted to the USFWS and CDFG, shall identify available measures, if any, needed to assure that the biological needs and habitat requirements for the protected species are being met, as designed in the HCP. The NBC, USFWS and CDFG, in consultation with MAP POA shall determine what measures shall be implemented. The report shall also address any funding needed to implement such measures. The MAP POA shall be responsible for levying assessments against each property owner as necessary to provide any additional funding to NBC to implement such measures, unless MAP POA secures an alternative funding source.

Unforeseen Circumstances. A drought event lasting longer than 6 years has not occurred in recorded history for the Sacramento or American River Basins, in the vicinity of the Natomas Basin. The potential damage from such a drought is not foreseeable, nor predictable. Therefore, a drought and the damage resulting from such event lasting longer than 6 years shall be considered an Unforeseen Circumstances.

9. Invasion of Non-Native Species - Plant and Animal

It is possible that the habitat reserves may become infested with non-native plant and animal species which could impact the quality of the wetland and upland habitat, although the management plans developed for the habitat reserves are required to include measures to prevent such infestations and thus the establishment of a major infestation should be low. A major infestation of fast growing weed species such as giant reed, Johnson grass, etc. can severely restrict water movement in wetlands and reduce habitat quality. The invasion of yellow star thistle in uplands can render fields useless for foraging animals. Large infestation of weedy species can become extremely expensive to control and could heavily tax the mitigation fund. Similarly there may be an invasion of non-native animals species which either prey on Covered Species or degrade habitat quality. A control program to eliminate the problem species can also be expensive.

Changed Circumstances. If a pest plant/animal infestation results in affects to any MAP POA HCP mitigation lands or facilities in a manner that requires expenditure of funds in excess of those required for normal maintenance and management activities, or an infestation that impacts greater than 25% of any single block of mitigation lands, or an infestation of any plant that is listed in the Federal noxious weed list or California Department of Food and Agricultural noxious weed list, the NBC, in consultation with USFWS's and CDFG's representatives on the Technical Advisory Committee (TAC), shall assess the extent of the damage in the habitat reserves. The NBC shall prepare a report, funded by MAP POA, within 60 days of the discovery of the infestation, which describes the extent of the problem, identifies a range of remedial actions, and includes a cost analysis for funding a control program. The report shall be submitted to USFWS and CDFG for review. The NBC, USFWS and CDFG, in consultation with MAP POA shall determine, within 30 days what measures shall be implemented to address the problem. The MAP POA shall be responsible for levying assessments against each property as necessary to provide to the NBC any additional funding for a control program, unless MAP POA secures an alternative funding source.

Unforeseen Circumstances. Due to the well documented national problem of invasive non-native plants and animals, and their effects on native vegetation and wildlife, no Unforeseen Circumstances exist for this event.

10. Toxic Spills and Illegal Dumping of Toxic Materials

Toxic spills and illegal dumping of toxic materials may occur on the either the MAP POA lands or mitigation lands. Changed and Unforeseen Circumstances apply in situations where a spill or illegal dumping occur on undeveloped MAP POA lands; on mitigation lands; or, on developed MAP POA lands or any other lands where the spill or dumping may affect undeveloped MAP POA lands or mitigation lands. The effect of spills or dumping may be direct or indirect.

Changed Circumstances. If one of the situations described above occurs and causes expenditures of funds in excess of those required for normal maintenance and management activities, the NBC, with the concurrence of USFWS's and CDFG's representatives on the Technical Advisory Committee, shall determine the extent of damage to the mitigation lands or undeveloped MAP POA lands and identify and implement any appropriate remediation response. In addition, consultation with local environmental health departments or other emergency response personnel shall occur to determine the appropriate agencies and alternatives available for providing remediation. MAP POA landowners shall continue to maintain their lands in a manner that prevents toxic spills and illegal dumping of toxic materials. The NBC and MAP POA landowners maintain all rights to prosecute and seek remediation from responsible parties for toxic spills and illegal dumping of toxic materials.

Notification. It is the duty of the NBC and MAP POA to notify USFWS and CDFG immediately if either becomes aware of an existing or potential Changed Circumstance. Written notice to USFWS and CDFG shall be provided within 7 calendar days of Changed Circumstance. Similarly, USFWS or CDFG shall notify NBC and MAP POA and the other wildlife agency immediately if it becomes aware of an existing or potential Changed Circumstance.

Unforeseen Circumstances. If one of the situations described above occurs and damages greater than 75% of the total mitigation lands, or undeveloped MAP POA lands an Unforeseen Circumstance will have occurred.

G. Enforcement and Amendments

1. Enforcement of the Section 10(a)(1)(B) and Section 2081 Permits

The provisions of the HCP are enforceable through the terms and conditions of the Section 10(a)(1)(B) permit and 2081 permit issued by the USFWS and CDFG, respectively and the MAP Implementation Agreement. MAP POA has agreed to enforce CC&Rs and the Section 10(a)(1)(B) permit and the Section 2081 permit on all individual landowner members that have signed the CC&Rs and the County of Sacramento has agreed to cease to issue and/or suspend Urban Development Permits to a particular landowner upon notification that landowner is not in compliance with HCP requirements.

a. Certificates of Inclusion

Take authorization will be provided to MAP POA landowner members through MAP POA's issuance of Certificates of Inclusion. Certificates of Inclusion will be issued to a landowner after mitigation fees have been paid and will require applicable take avoidance measures to be carried out in accordance with the terms of the MAP HCP to the satisfaction of the USFWS and CDFG.

b. Notice

Any notice required to with regard to the HCP or the terms and conditions of the Implementation Agreement must be given to the permittee by personal delivery or be by certified mail/return receipt requested as described in Section 8.5 of the MAP IA.

2. Suspension/Revocation

The USFWS or CDFG may suspend or revoke their respective permits if the permittee fails to implement the HCP in accordance with the terms and conditions of the permits or if suspension or revocation is otherwise required by law. Suspension or revocation of the Section 10(a)(1)(B) permit, in whole or in part, by the USFWS shall be in accordance with 50 CFR 13.27-29, 17.22 (b)(8), and 17.32 (b)(8) and the Implementation Agreement.

3. Minor Modifications and Amendments 16.Minor Modifications and Amendments

a. Amendments

Amendments to the incidental take Permits, the MAP HCP and the IA may be proposed by the MAP POA, USFWS, CDFG, and/or the NBC. The Party proposing the amendments shall provide to the NBC, MAP POA, USFWS and CDFG a written statement of the reasons for the amendments and an analysis of the effect of the amendments on the environment, Covered Species and the implementation of the MAP HCP. The Permits may be amended in accordance with all applicable legal requirements, including but not limited to the ESA, the National Environmental Policy Act (NEPA), the USFWS's permit regulations, CESA and CDFG's permit regulations. It is contemplated that minor modifications to the MAP HCP and the IA may be agreed to pursuant to subsection F. 2. b. below without requiring amendment of the Section 10(a) Permit or the Section 2081(b) Permit. In addition, certain modifications to the HCP, such as revisions to the mitigation fees or adaptive management changes to the NBHCP are deemed automatically incorporated into the MAP HCP as provided under the terms of the MAP HCP or IA and as provided in F. 2. c below.

b. Minor Modifications

Minor modifications may be made to the MAPHCP and/or the Implementation Agreement (IA) by the MAP POA, USFWS, CDFG and/or the NBC. Except where another process is specifically identified under the terms of the HCP or IA with respect to particular types of modifications or as provided in F.2.c below, the Party proposing a minor modification or amendment must provide notice to the other parties. Such notice shall include a statement of the reasons for the proposed modification and an analysis of its environmental effects, its effects on the implementation of the MAP HCP and on Covered Species. The parties will use best efforts to respond to proposed modifications within sixty (60) days of receipt of such notice. Except as otherwise provided under the terms of the MAP HCP or IA, proposed modifications will become effective upon all other parties' written approval or as otherwise provided under the terms of the HCP or IA. If, for any reason, a receiving party reasonably objects to a proposed modification or amendment other than those not subject to that party's approval under the MAP HCP or IA, it must be processed as an amendment of the Permit. Neither the USFWS, nor CDFG will propose or approve minor modifications to the MAP HCP or the IA if either agency determines that such modifications would: 1) result in operations under the MAP HCP that are significantly different from those analyzed in connection with the original MAP HCP; 2) result in adverse effects on the environment that are new or significantly different from those analyzed in connection with the original MAP HCP, or 3) allow significant additional take not analyzed in connection with the original MAP HCP. Minor modifications to the MAP HCP and/or the IA may include, but are

not limited to, the following:

- (1) correction of typographic, grammatical, and similar editing errors that do not change the intended meaning;
- (2) correction of any maps or exhibits to correct errors in mapping or to reflect previously approved changes in the Permits or HCP;
- (3) minor changes to survey, monitoring or reporting protocols; and
- (4) any other type of modifications to the MAP HCP and/or the IA that are minor in relation to the MAP HCP's goals, that the USFWS and CDFG have analyzed and agreed to, including, but not limited to, the approval or execution of any agreements with the County of Sacramento, other agencies, companies or individuals to facilitate the implementation of the Permits, the MAP HCP and/or the IA Agreement, including, but not limited to, agreements referenced in the Permits, the MAP HCP and/or the IA to take any actions; delegate any duties; create, extinguish, phase out, transfer or assume obligations of any type; make adjustments to ensure consistency with the NBHCP; or take any other minor actions desired by the parties in relation to the MAP HCP and/or the IA.

Subject to the exceptions noted above and in F.2.c below, any modifications to the MAP HCP and/or the IA will be processed as amendments of the Permits in accordance with F.2.a. above.

4. Automatic Amendments and Modifications

The MAP POA, USFWS, CDFG, and NBC all desire to have the MAP HCP and the IA maintain consistency with the Natomas Basin HCP and IA with respect to the NBC's responsibilities as Plan Operator under the NBIA and the MAP IA in particular with regard to the amount of mitigation fees, the Habitat Mitigation Land (HML) mitigation ratio, adaptive management measures and changes in response to a recovery plan. As a result, each of the Parties agree that any amendment or modification to the NBHCP or NBIA that affects the NBC's obligations as Plan Operator including, the amount of mitigation fees, the HML mitigation ratio, adaptive management measures and changes in response to a recovery plan shall automatically apply to the MAP HCP and IA unless MAP POA, NBC, USFWS and/or CDFG collectively determine that the amendment or modification need not apply to the MAP HCP and MAP IA.

5. Land Use Changes

The MAP POA, USFWS, CDFG, and NBC agree that the adoption and amendment of General Plans, Specific Plans, Community Plans, zoning ordinances and similar ordinances, and the granting of implementing land use entitlements by COUNTY, pertaining to land in the Permit Area, shall be matters within the sole discretion of COUNTY, and shall not require amendments to the MAP HCP or IA or require the approval of the other Parties. However, should COUNTY adopt or amend a General Plan, Specific Plan, Community Plan, zoning ordinance or similar ordinance or grant or an implementing land use entitlement within the Permit Area that materially and adversely affects the ability of the Permittee to carry out its obligations under the MAP HCP, such COUNTY action may result in suspension or revocation

of the Permits.

6. Changes in Response to a Recovery Plan

The MAP POA, USFWS, CDFG, and NBC intend that Changes in the MAP HCP or NBHCP with respect to the location of Conservancy Lands, the proportion in Managed Marsh, and other changes necessary to adapt the MAP HCP or NBHCP to meet the purposes of a Recovery Plan for the Giant Garter Snake or Swainson's Hawk shall not require an amendment of the Section 10(a)(1)(B) Permit or Section 2081(b) Permit.

7. County Adoption of HCP

At such time as the County of Sacramento adopts an HCP for unincorporated lands within the Natomas Basin which includes the MAP project area, MAP POA may choose to participate in the County's HCP, as described in Section 3.1.13 of the MAP IA.

IV. ALTERNATIVES TO THE PROPOSED ACTION

Section 10(a)(2)(A)(iii) of the Endangered Species Act of 1973, as amended, requires that alternatives to the taking of species be considered and reasons why such alternatives are not implemented be discussed. These alternatives are presented as follows:

A. No Action Alternative

The No Action alternative means that no Section 10(a)(1)(B) permit (incidental take permit (ITP)) would be issued for take of listed species during urban development and other activities in the Metro Air Park Project area.

This alternative would maintain the status quo of no take authorized for federally listed species. Specifically, take of the federally-listed giant garter snake would be prohibited. Since the site supports the GGS, this alternative would preclude development of the MAP project as it is currently contemplated by the County Metro Air Park Special Planning Area ordinance. It is uncertain whether, and if so, which crops would be farmed on the property. Presumably the same type of crops that have historically been farmed would continue to be farmed including rice, alfalfa, sugar beets, and pasture. It is unknown whether any lands would be returned to rice farming or whether they would be maintained in dry land crops or kept fallow.

The No Action Alternative would involve the USFWS not issuing a Section 10(a)(1)(B) permit. Under this alternative, development within the project area would be subject to detailed plant and animal surveys in order to prove presence/absence of listed species within development areas. Each proposed development project would require individual consultation and potentially uncoordinated minimization and mitigation efforts. Separate incidental take permits would need to be processed which would consume significant amounts of USFWS staff time. This alternative is contrary to the USFWS policy to encourage landowner participation in regional planning efforts where they are in place as in the Natomas Basin.

This alternative would likely result in the absence of any rice land farming in the area, resulting in continued degradation of habitat area with no resulting mitigation. It is anticipated

that farmers would believe they have little choice but to cultivate crops besides rice, most likely cotton, safflower, orchards or vineyards, which would eliminate habitat provided by rice cultivation for the giant garter snake and also significantly limit existing suitable foraging habitat for the Swainson's hawk and other covered species.

For these reasons, it is anticipated that the No Action Alternative would not protect habitat that exists today for the covered species. In fact, if habitat disappears due to changes in agricultural crop rotations, future development of this area thereafter would likely require less mitigation to mitigate for impacts to the covered species if covered species no longer occupied the area.

Under this alternative, development would likely still ultimately occur although it may be delayed as site specific developments process incidental take permits individually, or as future studies confirm that there would be no take, therefore, no need for incidental take permits on specific parcels following species extirpation.

B. County as Permittee

The NB HCP originally contemplated five permittees: the City of Sacramento, the County of Sacramento, Sutter County, Reclamation District Number 1000, and the Natomas Central Mutual Water Company. At present the County has not submitted an application for incidental take permits for the Natomas Basin. Under the NB HCP, the County of Sacramento would be the Applicant for the Section 10(a)(1)(B) permit and would become the designated permittee for all lands in the Natomas Basin that are within the unincorporated area of the County. This area includes the Metro Air Park project site. Under this alternative, the MAP Property Owners Association would delay development of the MAP project until the County obtained a Section 10(a)(1)(B) permit for areas under its jurisdiction in the Natomas Basin.

The County may use a version of the HCP similar to the City's NB HCP or could draft an HCP that is significantly different from the NB HCP. Similarly, the County could rely on the NBC to carry out mitigation under its HCP, could carry out mitigation on its own, or could use a different entity entirely.

The Metro Air Park project has all local land use approvals and delaying development while waiting for the County to obtain its own ITP is expected to result in multi-year delays to project construction. This alternative is not carried forward for detailed analysis because the County has not come forward with a proposed HCP that covers the Metro Air Park project site or expressed any recent interest in participating in the NBHCP or similar HCP. Thus MAP does not consider the above alternative to be a feasible option.

C. Reduced Development On-Site

This alternative would result in reduced development of the MAP site. The land use plan for this alternative would be the same as the proposed HCP alternative with the exception of the size of the golf course. The 18-hole golf course situated on approximately 279 acres would be reduced to a 140-acre 9-hole golf course. This would reallocate 140 acres on-site for the re-creation of habitat as a mitigation area for covered species.

This 140-acre mitigation area, managed consistent with the reserve goals of the NBC and the proposed HCP alternative, would be anticipated to be situated within the golf course area depicted in Figure 2. Such a mitigation area would comprise about seven percent of the project site. The interrelationship of this area with drainage and water quality protection facilities for the site would assure the existence of suitable year-round water supplies necessary to provide habitat for covered species.

On-site habitat preservation is generally a preferable means of mitigating impacts to covered species when natural habitat features on an impact site are not easily established at other locations (i.e., certain types of wetlands, large rock outcropping nesting sites, etc.).

The Metro Air Park site does not contain natural habitat for covered species because the site historically has been converted entirely to cultivated agriculture during which conversion all natural habitat was eliminated. On-going intensive agricultural activities up to the present day have, for the most part, prevented the reestablishment of natural habitat on-site. Covered species have persisted on-site only to the extent they have adapted to life within cultivated fields and man-made ditches. Based upon the costs involved, re-creation of habitat on-site as a result of reduced development was considered as an alternative means to offset impacts to covered species.

There may be certain biological advantages to creation of habitat lands on-site. One such advantage could be that protection of a certain number of individuals of the covered species actually occurring on the Metro Air Park site from take might result in retention of a segment of the population that may later be determined to be particularly significant for biological reasons that are unknown today. Another advantage might be that a population segment preserved on-site would be isolated from other populations to a certain degree which might insulate the preserved population from disease or other catastrophic event to which other population segments are exposed.

Except for some limited connectivity to the site drainage system, the 116-acre mitigation area would not contribute to the larger habitat reserves being developed in the Natomas Basin by the NBC. Although, MAP POA mitigation fees would provide for the establishment of roughly 800 acres of off-site mitigation land which would be part of the NBC reserve system.

The 116 acres of on-site mitigation habitat is not located off-site away from intensive urban activities, vehicular traffic, pollution that can cause continued and unmanaged take of covered species. This problem is likely to be further compounded because of this mitigation area's location near an area of intensive human activity (i.e., the 9-hole golf course), several perimeter roadways, and State Highway 99/70.

In fact, because an on-site mitigation area would be surrounded by urban development it should be anticipated that adverse urban "edge effects", including intrusion/predation by: feral pets (i.e., primarily cats and dogs); alien plant or animal species (i.e., water hyacinth, predatory fishes, etc.); garden and commercial herbicides, pesticides, fertilizers, detergents, petroleum substances, other chemically laden runoff and eroded soils; young and adult human pedestrians and those upon horseback or motorized vehicles (i.e., dirt bikes, ATVs, 4x4 vehicles, etc.); changes in site hydrology due to adjacent urban activities of various types; and other adverse effects will occur.

The MAP HCP which imposes mitigation fees on each acre of development that will be used to purchase large, permanently protected and managed habitat reserves for the GGS offers a conservation strategy that assures that lands in the Natomas Basin continue to sustain viable populations of GGS over the long term in the face of the strong urban development pressures in the basin.

The acquisition of 200 acres of protected SH reserve lands accompanied by the obligation to plant fifteen (15) nest trees and permanently manage the reserve lands for the benefit of the hawk, is a more viable conservation strategy than simply leaving the single nest tree currently on the MAP POA lands in place as the lands around it convert from foraging habitat to urban uses. Such a reserve, managed in perpetuity for the Swainson's hawk, would support many more nest trees that could be used by more than just this one pair of birds.

The best approach to sustaining viable populations of the covered species in the Natomas Basin over the long term is through the implementation of a regional conservation strategy that provides for the acquisition of sizable interconnected habitat blocks throughout the basin managed for the benefit of the Covered Species while allowing the urbanization of other lands to proceed.

Apart from its limited biological value, removing portions of the project from development would compromise the financial integrity and feasibility of the MAP plan. Several of the current owners in MAP have owned their property since the late 1960's, when Sacramento Metropolitan Airport opened and the County of Sacramento designated the property as Air port Related – Industrial. Most of the current owners have owned their property since the mid-1980's. At that time it was anticipated MAP would be developed within a few years; but the 1986 floods delayed the project's development. The MAP property owners organized in 1989 to form the Metro Air Park Association (MAPA). Over 70% of the acreage participated financially through monthly assessments. The remaining acreage did not participate financially, but has been historically supportive of the MAPA's efforts.

For the next three years, scoping studies were completed, appropriate land uses were identified, and allocation of land uses among owners were completed. An application to amend the General Plan and Community Plan designations of the property to a mix-use industrial-business park was submitted to the County of Sacramento for processing in 1991. The MAP Draft EIR was circulated in 1992. The Final EIR was certified in 1993 and a Special Planning Area ordinance was adopted August 1993 as County Ordinance No. 93-0045 (MAP Ordinance) which included a circulation plan and lot exhibit consistent with the zoning. Since then the MAP ordinance has been amended twice in 1998 (98-0002 and 98-0020).

In February 1998, the County approved the tentative subdivision map for MAP. In September 1998, the County Board of Supervisors approved the formation of the MAP Community Facilities District (CFD) No. 1998-1 to proceed with the planning and design related to the infrastructure described in the Master Facilities Plan. The total cost of this work was funded by proceeds from Mello-Roos bonds that were issued in December 1998 in the amount of \$5.31 million.

On September 26, 2000, the County Board of Supervisors approved the MAP Public Facilities Master Plan that described all roadways, drainage, water supply systems, and sanitary

sewer systems needed for the full build out of MAP. This Master Plan required the review and concurrence of Natomas Mutual Central Water Company, Reclamation District 1000, Natomas Basin Conservancy, Cal-Trans, Federal Highways Administration, Federal Aviation Administration, Regional Transit, Sacramento County Department of Transportation, Sacramento County Public Works Agency, Sacramento County Regional Sanitation District, Sacramento County Community Sanitation District -1, Sacramento County Water Resources Division, Sacramento County Water Agency, and others.

To date the owners have spent over \$3.5 million and assumed \$5.3 million of Mello-Roos debt to implement MAP. Eliminating a portion of the project from development would infeasibly increase development costs on the remaining landowners, undermine the financial structure created to develop and implement the project, and would require modification of the land use plan or master facility plan for MAP and result in significant delays, one or more of which are expected to render the project infeasible.

The tentative subdivision map from Sacramento County which allows development to proceed, is scheduled to expire on February 23, 2003. Any changes to the project at this point in the process would require that several plans, including the Master Facility Plan and Master Facilities Financing Plan, be redone. The work necessary to revise and again obtain approval of new plans would surely exceed the February 23, 2003 expiration date for the map. If the tentative map expires, the project's conditions of approval and mitigation measures would become null and void and all implementing agreements with the agencies would no longer apply to allow development or species mitigation to occur.

Furthermore, now that the Sacramento County Board of Supervisors has approved the Facilities Financing Plan in September 2000, and the owners have completed the Mello-Roos bond tax election and incurred over \$5.3 million in debt, should the project be changed and the Financing Plan revised, this would void the county's approvals and the Mello-Roos bond election would have to be reinitiated all over again to amend the plan. The procedures necessary to carry out this election would surely exceed the February 23, 2003 subdivision map expiration date. In addition, the Mello-Roos bond buyers are finalizing complex Bond Purchase Agreements with Sacramento County and any change to the Facility Plan or Facilities Financing Plan at this time, would allow the bond purchasers the opportunity to reconsider their bond purchases and withdraw support for the project, leaving the project totally infeasible without adequate funding for either development or species mitigation.

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Figure 1: Regional Location and Permit Area

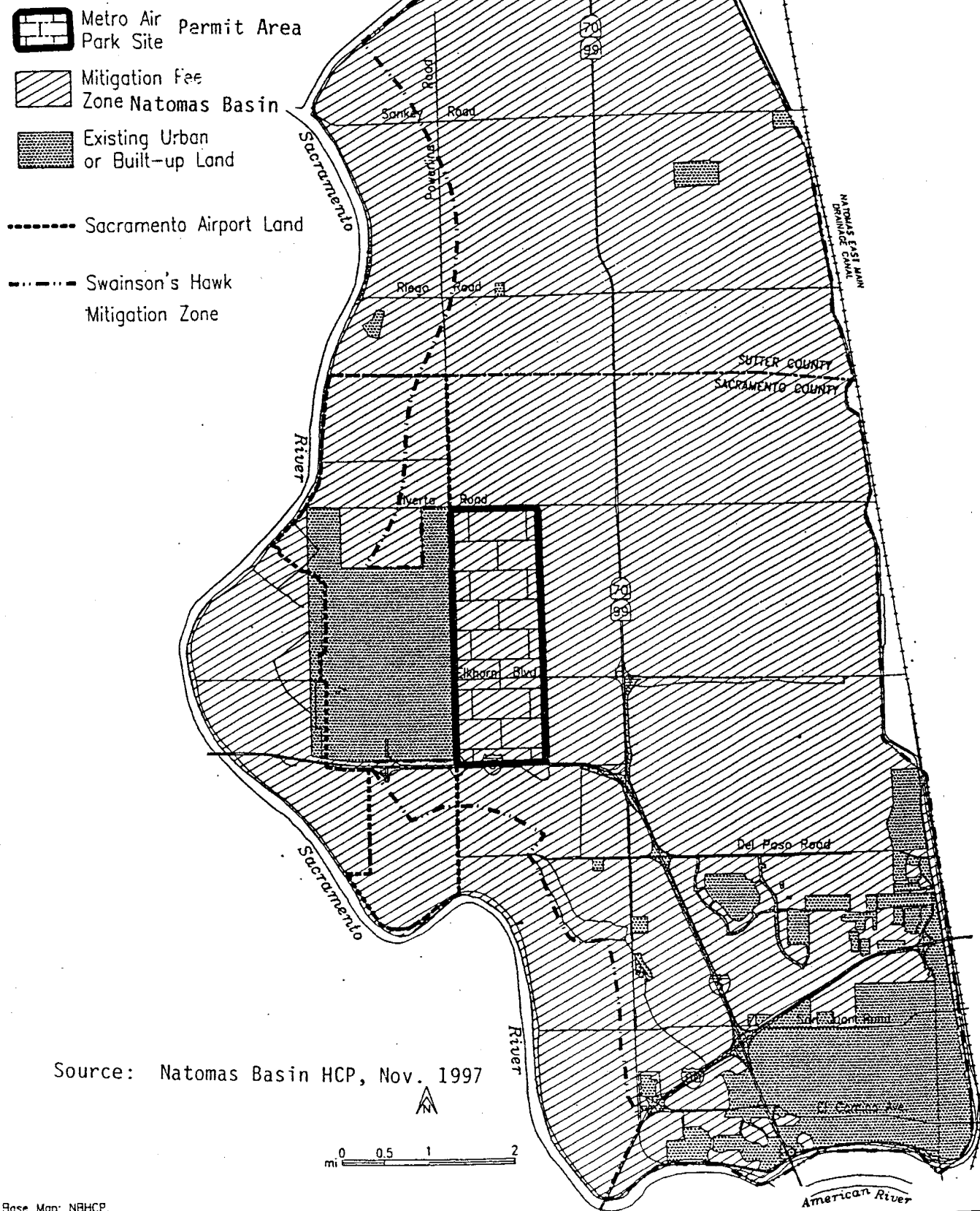
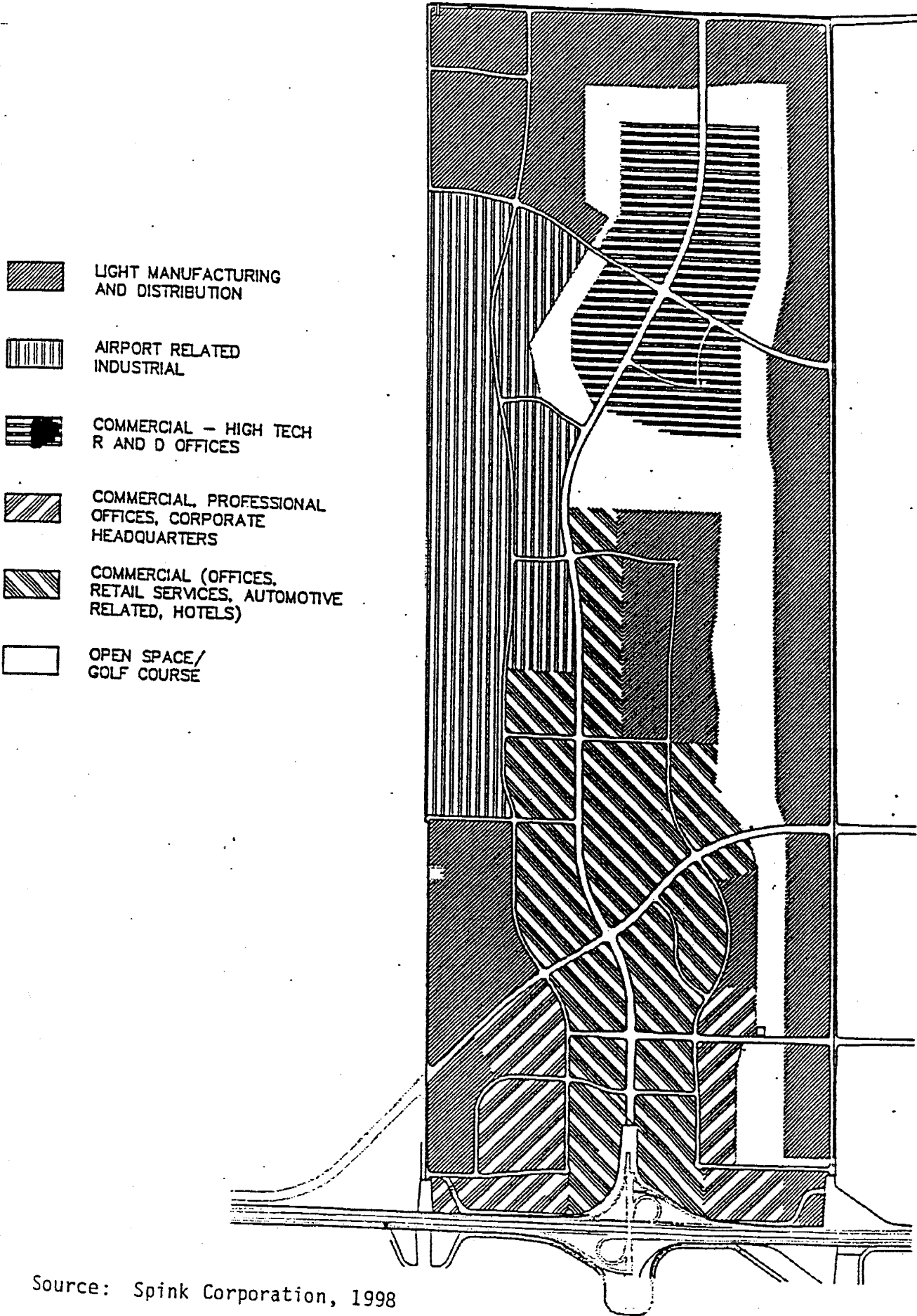


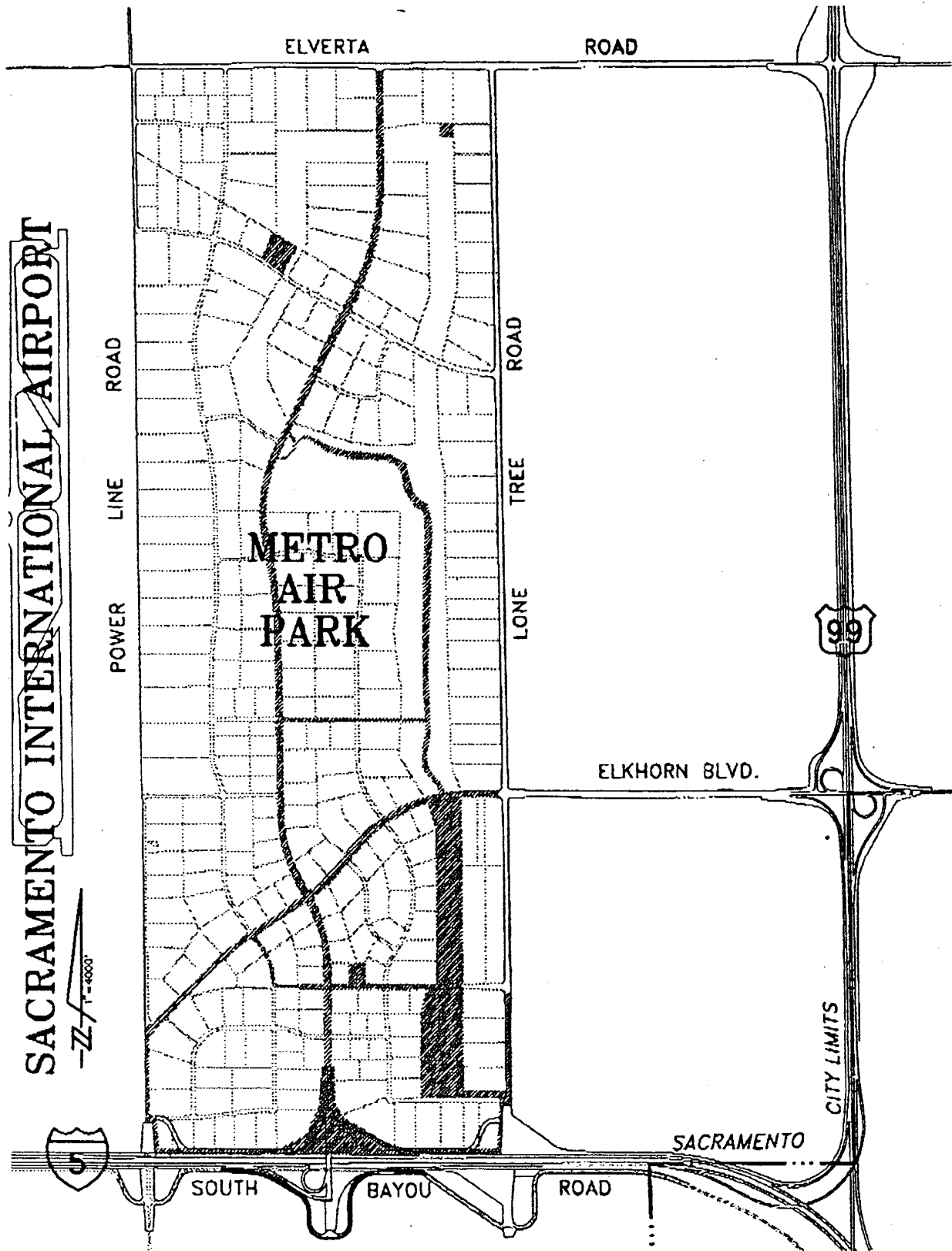
FIGURE 2: LAND USE PLAN



Source: Spink Corporation, 1998

Figure 3

SPECIAL PLANNING AREA INITIAL PHASE URBAN DEVELOPMENT



- AREA OF URBAN DEVELOPMENT
149.4 AC
- AREA TO REMAIN IN FARMING
1,742.8 AC

The Spink Corporation
3500 VENTURE GALE WAY, SACRAMENTO CALIFORNIA 95833-3200
PHONE: (916) 523-0500 FAX: (916) 521-0274

Figure 4b: Off-Site Improvements

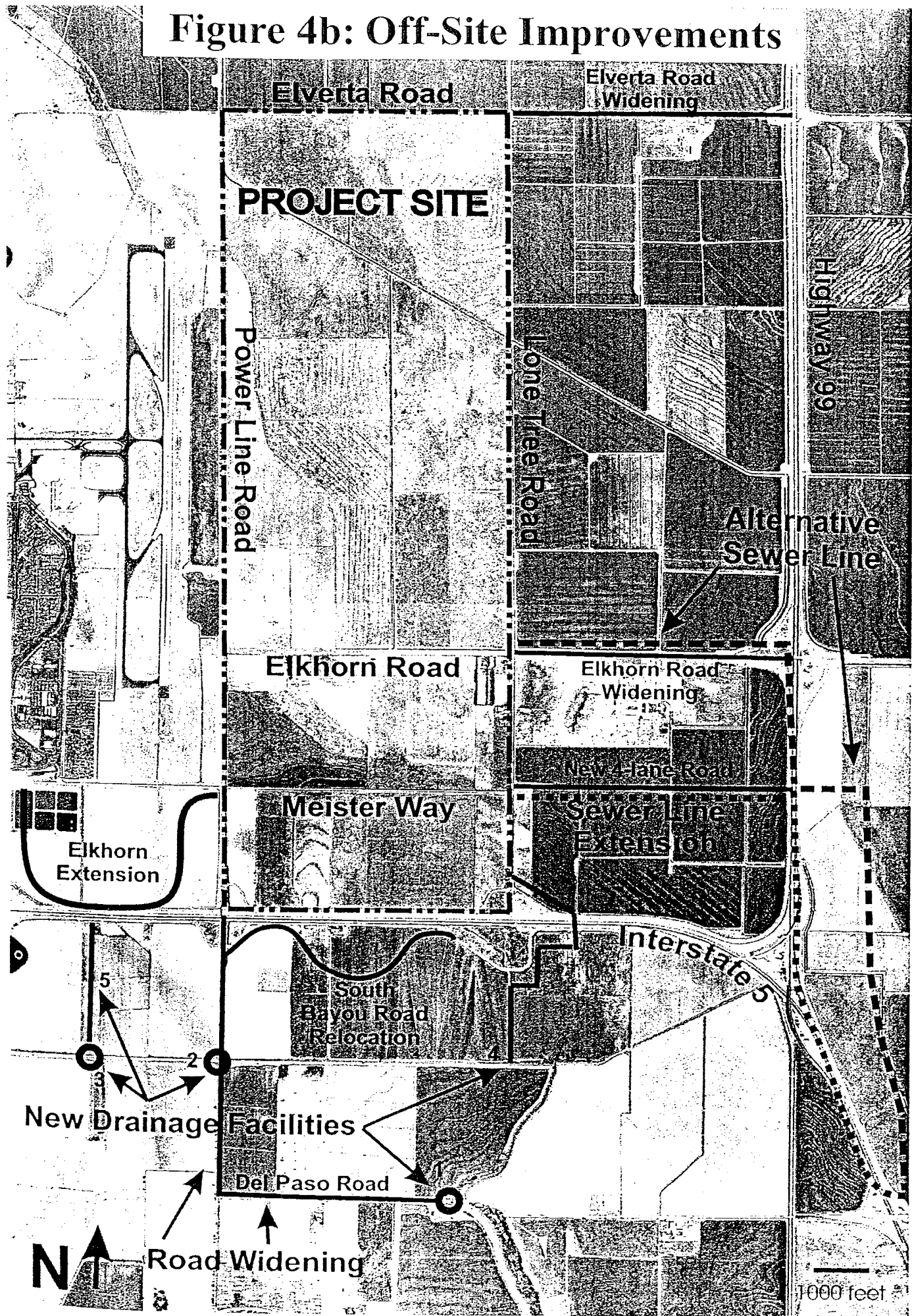
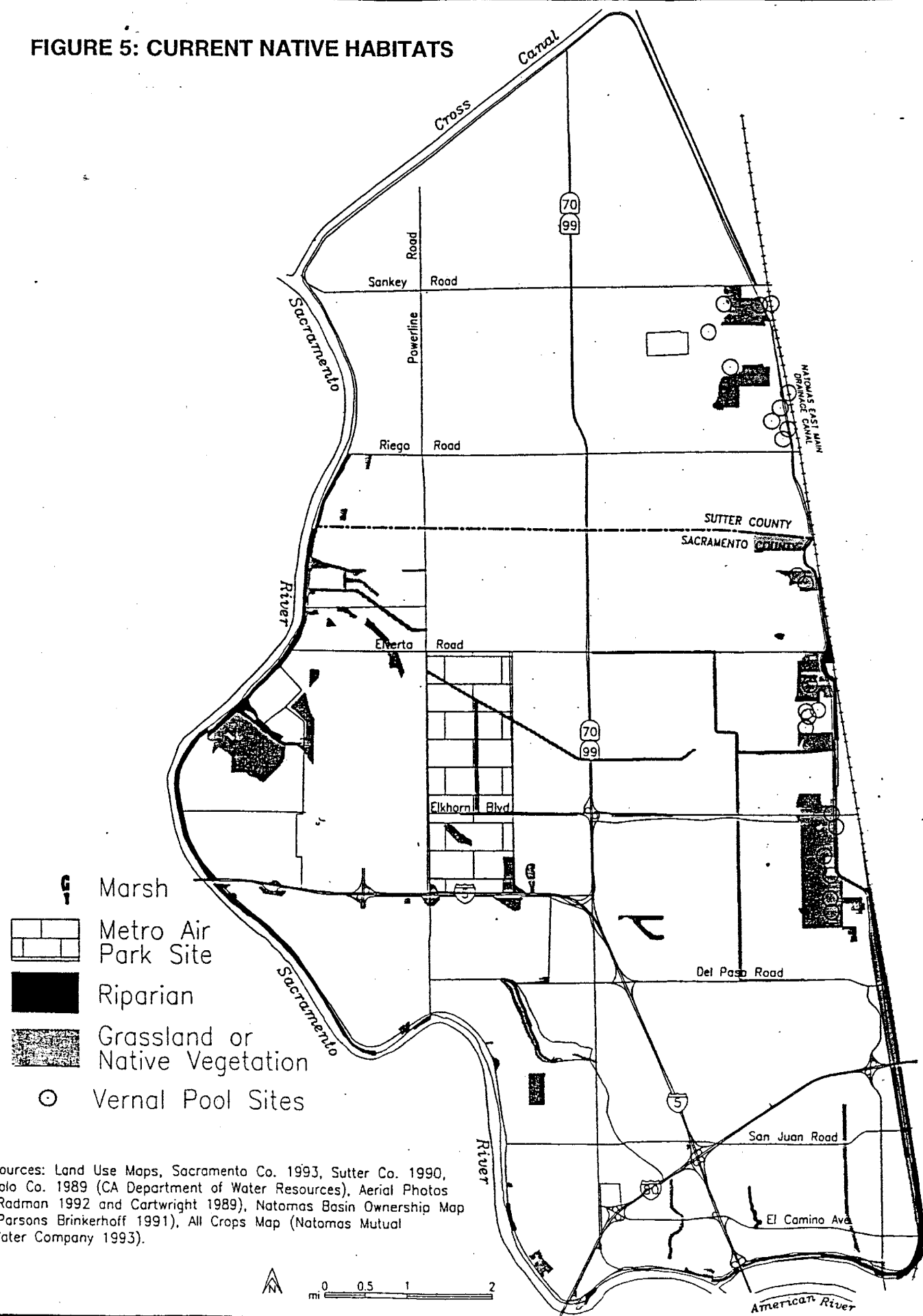


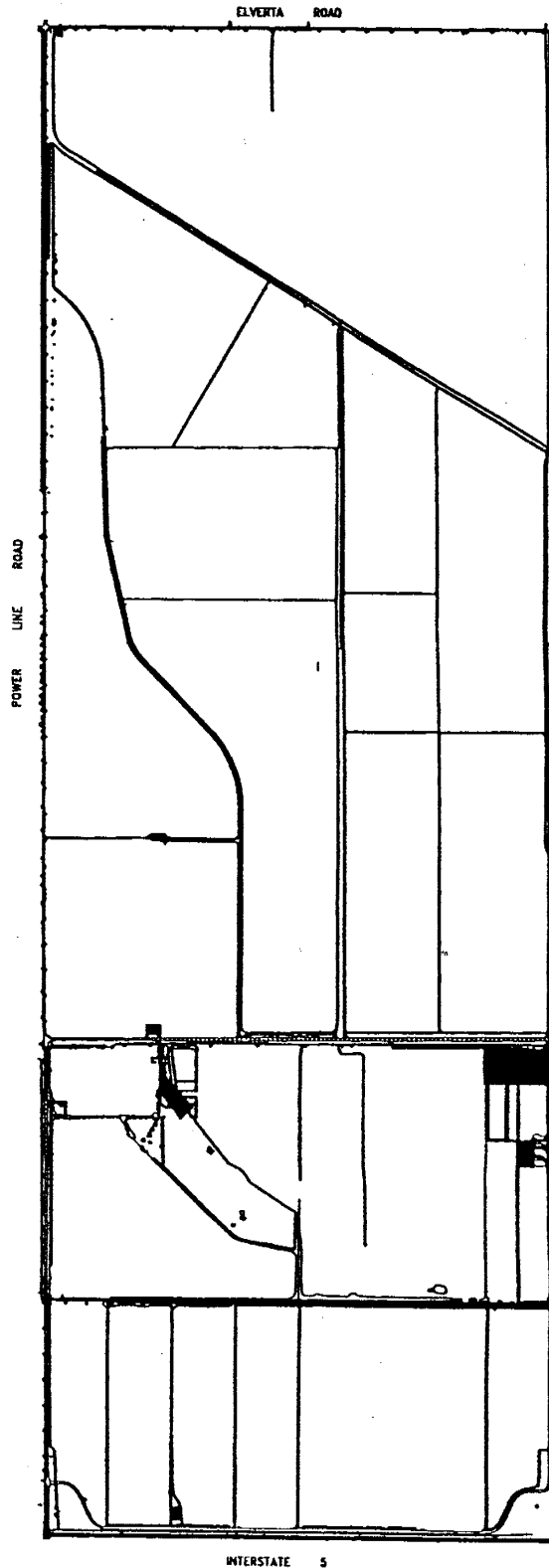
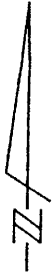
FIGURE 5: CURRENT NATIVE HABITATS



Sources: Land Use Maps, Sacramento Co. 1993, Sutter Co. 1990, Yolo Co. 1989 (CA Department of Water Resources), Aerial Photos (Radman 1992 and Cartwright 1989), Natomas Basin Ownership Map (Parsons Brinkerhoff 1991), All Crops Map (Natomas Mutual Water Company 1993).

FIGURE 7

MAPPOA'S BASELINE MAP



APPENDIX A

FUNCTIONS OF THE NATOMAS BASIN CONSERVANCY AND REGIONAL MITIGATION PROGRAM UNDER THE 1997 NATOMAS BASIN HABITAT CONSERVATION PLAN

The NBC will perform an important function for the MAP HCP by establishing and overseeing a concerted Basin-wide program for acquiring and managing mitigation lands on behalf of Regional Plan (Natomas Basin HCP) permittees. Specifically, the NBC will be responsible for collecting and managing mitigation fees required by the City and Counties and the Metro Air Park Association, for using the fees to establish mitigation lands, and for managing the mitigation lands for the benefit of the covered species. Mitigation lands will be established through fee simple or easement acquisition. The NBC may legally buy and sell land, lease land for revenue, hold title to conservation easements, etc. As a non-governmental entity, the NBC has no powers of condemnation and can only purchase lands from willing sellers. The NBC will also have full power to establish and sign contracts with appropriate individuals or organizations for the purpose of carrying out specific activities under the regional mitigation program, including, but not limited to, managed marsh construction, habitat restoration, and monitoring.

All proceedings of the NBC will comply with the Ralph M. Brown Act (California Government Code, Section 54950 et seq.) regarding open and public meetings, and with the California Public Records Act (California Government Code, Section 6250 et. seq.) regarding maintenance of public records. The NBC may, in time, be succeeded by another suitable non-profit entity or by CDFG (see Section 3.4.9 of the MAP Implementation Agreement).

Activities of the NBC will be overseen by a Technical Advisory Committee (refer to Chapter IV.4.b. in the NBHCP for more information on the TAC). The NBHCP text is in *italics* while update notes are shown in plain text.

The NBC was formed in 1994 but was not in full operation, with staff and a Board of Directors until early 1999. At present, the NBC carries out mitigation activities to implement the regional plan for the City of Sacramento as required by the City's Natomas Basin Habitat Conservation Plan (NB HCP) and Implementation Agreement.

The City of Sacramento collects mitigation fees for all urban development within its boundaries within the Natomas Basin. As of the end of 1999, the City had collected almost \$8,000,000.00 of mitigation fees from approximately 3,000 acres of urban development. The mitigation fees were forwarded to the NBC.

The NBC's current mitigation objective for the Regional Program is to maintain 25% of reserve land as managed marsh, 25% of reserve land as upland habitat for use by Swainson's hawk, and 50% in rice production that is grown using best management practices for giant garter snake and other wetland species.

APPENDIX A - FUNCTIONS OF NBC UNDER THE 1997 NBHCP

The following is a summary of some of the NBC's accomplishments as described in its 1999 Annual Report:

- The NBC acquired seven farms totaling approximately 1,300 acres of habitat mitigation land.
- The 1999 mitigation acreage totaled more than the required 1999 mitigation needs of 800 acres.
- Mitigation land acquisition met the requirement of a minimum of one contiguous 400-acre parcel.
- Steps were taken to remove barriers to giant garter snake migration onto NBC lands.
- The NBC worked to protect areas on its mitigation lands where NB HCP species are known to exist.
- Fields were managed in such a way as to encourage Swainson's hawk foraging activity.
- Swainson's hawk and giant garter snake surveys were conducted in the Natomas Basin.

In addition, the NBC completed preparation of a Site-Specific Management Plan (dated July 14, 2000) for their approximately 1,300 acres of mitigation lands acquired for the City of Sacramento as of the end of 1999. According to the Plan "to meet wetland conservation objectives, a minimum of 324 (25% of total) will be developed as managed marsh on the various sites; approximately 648 acres (50% of the total) will be maintained in rice production. To meet upland conservation objectives, a minimum of 324 acres will be developed or maintained as uplands that provide foraging, nesting, or future nesting sites for Swainson's hawk."

1. Conservation Strategies -- Establishment of Habitat Reserves/Mitigation Ratio

The following discussion of conservation strategies is taken straight from the NBHCP as it describes the regional mitigation program in which MAP POA will participate.

The primary type of mitigation for the impacts of urban development on covered species and habitat values in the Natomas Basin will be the collection and use of mitigation fees to set aside 0.5 acres of habitat land for each 1.0 acres of gross development that occurs in the Basin. This 0.5-to-1 ratio will specifically mitigate for the loss of wetland habitat values necessary for the giant garter snake and other wetland associated species (see below, Section C. 1), and for the loss of upland habitat values necessary for the Swainson's hawk and other upland species (see below, Section C .2). For purposes of the NBHCP, urban development of all currently undeveloped land on a gross-acre basis converted for other uses will be subject to the mitigation fee, including urban uses (commercial, industrial), roads and utilities (public or private), schools and other public facilities, golf courses, and other developed parks, except as otherwise specified.

Based on existing general plans, reasonably foreseeable development will result in approximately 17,500 acres in the Natomas Basin being converted to urban and associated uses. Thus, under the 0.5-to-1 mitigation ratio, approximately 8,750 acres of land will be acquired by the NBC and set aside as habitat reserves (however, note that the effective ratio is actually

APPENDIX A - FUNCTIONS OF NBC UNDER THE 1997 NBHCP

higher than 0.5-to, because all undeveloped lands in the plan area are subject to the mitigation ratio regardless of their value as habitat for the covered species). Habitat reserves will be managed by the NBC and will consist of managed marsh habitats, upland habitats, rice fields (which will typically be leased for use to rice farmers), and associated buffers and infrastructure. The NBHCP does not specify any particular land area for acquisition for habitat reserves, since many factors will affect the land areas ultimately purchased.

Note: Metro Air Park's portion of the foreseeable development is as much as 1,892 acres, roughly 10 percent of the total. Under the 0.5:1 mitigation ratio, the MAP will generate 940 acres of mitigation land, roughly 10 percent of the total.

2. *Conservation Strategy for Wetland Habitat Values*

Conservation objectives for the giant garter snake under the NBHCP are:

(1) *Maintenance of the long-term integrity of the Natomas Basin giant garter snake population.*

(2) *Mitigation to fully offset impacts of urbanization on the giant garter snake and other covered species through development of a biologically sound network of habitat reserves that contribute to the recovery of these species.*

(3) *Reserves described in (2) above will consist of habitat blocks a minimum of 400 acres in size, consisting of both wetland and upland habitat, with an interlinking network of water supply channels or canals. The reserve system will also include at least one parcel a minimum of 2,500 acres in size.*

(4) *Of that portion of the reserve system that is committed to wetlands, 75 % of its total area will be maintained as rice lands and 25 % will be maintained as managed marsh. This 25 % managed marsh requirement shall be satisfied by the end of the fifth year after issuance of the state and federal permits (see Sections 5.5 and 5.7 of the MAP Implementation Agreement). However, this rice-to-marsh proportion may be revised if the Giant Garter Snake Recovery Plan, when such a plan is approved by the USFWS, makes any recommendations with respect to the relative importance of these habitats to giant garter snakes (see Section H below). However, under any future giant garter snake Recovery Plan recommendations, the maximum that may be committed to managed marsh under the NBHCP is 75 % of the wetland reserve system's land area.*

(5) *Improvement of giant garter snake habitat values in reserve areas in the Basin through habitat creation, protection and enhancement; reduction in mortality sources; and appropriate water distribution systems management (through inclusion of RD 1000 and NCMWC as permittees).*

b. *Establishment and Management of Wetland Reserves*

APPENDIX A - FUNCTIONS OF NBC UNDER THE 1997 NBHCP

A primary goal of the NBHCP is to create a system of wetland reserves, with associated uplands, that would support populations of the giant garter snake and other covered species which co-exist with the garter snake in the same habitat. The final reserve system will consist of at least one 2,500-acre or larger contiguous block of reserve land. At completion, the remainder of the reserve system will consist of 400-acre or larger blocks of habitat.

Wetland Reserve Acquisition Criteria/Methodology

Habitat reserves will be established by the NBC in consultation with its Technical Advisory Committee. Prior to purchase, all lands being considered for acquisition will be submitted to USFWS and CDFG for review and concurrence; such concurrence will be required before any land acquisitions are completed. However, formal USFWS and CDFG concurrence may be waived, provided that the NBC's Technical Advisory Committee, including its USFWS and CDFG representatives, unanimously concurs in the proposed acquisition and that documentation of such concurrence is placed into the NBC's administrative record. In addition, the NBC will formulate an annual work plan within its annual report which identifies lands identified for acquisition in fee or by easement during the following year.

The following guidelines will be used to identify lands for wetland reserve area acquisition:

- (1) Land has existing or potential wetland habitat values that currently support or can support, with necessary enhancement and restoration, giant garter snakes and other wetland associated covered species.*
- (2) Land contains soils that can support rice farming or the type of managed marsh wetlands proposed in the Plan (see Managed Marsh Design/Management section below).*
- (3) Land meets the minimum parcel size criteria according to existing general plan designations within the jurisdiction where the land is acquired (usually 20 acres or greater in agricultural zoning).*
- (4) Land has adequate buffers from public roads and other adjoining land uses, as necessary (see Buffers section below).*
- (5) Land is adequately removed from incompatible urban development or uses (see Setbacks section below).*
- (6) Land must be hydrologically connected to the RD 1000 or NCMWC canal systems or to another suitable water supply source or system. Blocks of reserve lands must also be hydrologically connected to other blocks through irrigation and drainage systems or other systems to ensure connectivity and opportunity for travel by garter snakes between sections of the reserve system. To the extent practicable, reserve lands should also be near or adjacent to other protected lands; this would increase the overall effectiveness and size of protected lands in the Basin for covered species.*
- (7) Land has an adequate water supply and adequate water rights.*

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Buffers

Reserve lands shall, to the extent necessary and practicable, include adequate buffers to minimize the effects of incompatible adjoining land uses, including roads, on the reserves. In addition, the buffers will help ensure that the management of reserve lands does not impose an unnecessary burden on adjoining landowners. Buffers shall be established so that they are inside the reserve system (i.e., the buffers shall be part of, not outside of, reserve lands).

Buffers between giant garter snake reserve lands and surrounding land uses (e.g., urban or residential areas) will extend from the outside edge of the habitat (i.e., levee toe or maintenance road) to the boundary fence or edge of the designated reserve area. This "perimeter" buffer will consist of at least 75 feet of native or ruderal vegetation. Giant garter snake habitat will be separated from public roads by a minimum 30-foot buffer between the habitat and the outside edge of the road right-of-way.

However, buffers may not always be necessary or in certain cases may not represent the best use of reserve lands. Therefore, buffer widths may be reduced or buffers may be eliminated on a case-by-case basis, if: (1) the NBC's Technical Advisory Committee, including its USFWS and CDFG representatives, concur unanimously in a decision to reduce or eliminate buffers on a case-by-case basis; or (2) if not unanimous, the USFWS and CDFG concur in writing that a buffer may be reduced or eliminated. Decisions about the need for buffers and buffer widths shall be included in the management plan(s) for any given parcel or block of reserve land (see below, Section D).

Thus, the presence, width, or extent of buffers may vary with the situation, as long as they adequately reduce population mortality effects. For example, if the reserve lands are adjacent to other protected natural habitat or open space, then buffer widths could be reduced or eliminated. Narrower buffers would also be acceptable between garter snake habitat and agriculture, with the buffer width depending upon the particular crop and farming practices.

Buffer areas as described above may serve as upland habitat adjoining wetlands and may be counted toward the upland portion of the wetland reserve system, so long as the total area of buffer claimed as upland habitat does not exceed ten percent (10%) of the total wetland mitigation requirement.

Setbacks

All mitigation lands acquired by the NBC or for which conservation easements are obtained shall, at the time of acquisition and with the exceptions described below, be situated a minimum of 800 feet from existing urban lands or lands that are designated for urban uses in an adopted general plan. However, mitigation lands or easements closer than this setback distance may be acquired on a case-by-case basis, if: (1) the NBC's Technical Advisory Committee, including its USFWS and CDFG representatives, concur unanimously in a decision to reduce the setback distance; or (2) if not unanimous, the USFWS and CDFG concur in writing that a reduction in the setback distance is necessary or appropriate. For purposes of this provision, "existing urban lands" means lands that are intensively or completely developed for urban,

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commercial, or residential uses or are adjacent to or within the immediate vicinity of intensively developed areas, such that the direct and indirect effects of such development are significantly incompatible with the objectives and purposes of the reserve system and would be likely to have significant adverse effects on reserve viability or on covered species inhabiting the reserve lands. "Lands that are designated for urban uses in an adopted general plan" has the same meaning as "existing urban lands," except that such development and its associated effects on reserve lands, if reserves were acquired in the vicinity, would be presumed to be present in the foreseeable future consistent with the general plan. The rationale for decisions about setback distances, where the setback differs from the 800-foot requirement described above, shall be included in the management plan(s) for any given parcel or block of reserve land (see below, Section D).

Lands in the intervening 800 feet between urban development and reserve areas should be in agriculture or another open-space or non-urban use. However, such lands will not necessarily be under the control of the NBC and will not typically count as mitigation land. The purpose of this provision is, to the maximum extent practicable, to ensure that reserve lands are not established near or adjacent to significantly incompatible urban land uses, not to impose an obligation on either the NBC or the owners of the setback lands to manage the lands in any particular fashion. Thus, it is the responsibility of the NBC to locate reserve lands sufficiently far from urban areas or from lands designated for urban uses to fulfill this requirement; however, the setback requirement applies only to land acquisition by the NBC and is not to be construed as a land use restriction on privately owned land within 800 feet of any land with the NBHCP reserve system.

If the NBC proposes to establish all or part of the 800-foot setback on NBC mitigation land (that is, the setback would be part of the reserve system), the USFWS and CDFG must review the status and adequacy of the area as mitigation land on a case-by-case basis and approve any such decision or purchase in writing. However, if the setback land within the reserve is considered mitigation land and then loses that status due to encroaching development, the NBC must acquire an additional area of land equal in acreage to the lost portion of the setback.

The status and adequacy of setbacks will be reviewed and, where necessary and appropriate, corrected during the NBHCP 9,000-acre program review described in Section I below.

Protection from Flooding

Flood waters can destroy giant garter snake underground retreats by (1) liquefying the fine clay-silt substrate, allowing tunnels to collapse; (2) saturating the substrate with water, allowing the soil to swell and thus eliminate deep cracks that had been created by shrinking during a previous drying of the soil; (3) exposing slopes lying below the high water mark to the erosive force of wave action; and (4) depositing silt that blankets substrate surfaces and covers any underground retreats that survive (1), (2), and (3). While giant garter snakes can survive being flooded from underground retreats (Glenn Wylie, BRD, pers. comm.), such disruptive events are not advantageous either to garter snakes or to management of wetland reserves under the NBHCP.

APPENDIX A - FUNCTIONS OF NBC UNDER THE 1997 NBHCP

Consequently, lands selected for the NBHCP wetland reserve system shall be situated outside areas known to regularly receive flood waters (e.g., the Yolo and Sutter Bypasses). They shall also be situated so that they do not directly receive Flood waters from urban areas or direct runoff from paved surfaces or inflow from urban storm water drainage systems. Also, the drainage regime for managed wetlands or rice fields inside the reserve system shall be designed to ensure that giant garter snake retreats are not inundated when water is drained from ditches, fields or wetland areas. It is also desirable to locate upland habitats inside the wetland reserve system to avoid flooding of winter retreats.

Managed Marsh Design/Management

The NBHCP recognizes the wildlife values for many covered species associated with natural marsh and managed marsh areas as well as rice fields and seeks to protect, restore, or create such areas through the NBHCP's conservation program. Management of rice fields is discussed in the next section.

Section C.1.a of the NBHCP requires that at least 25 % (and possibly up to 75 %) of the land acquired for the NBHCP reserve system be converted into managed marsh wetlands to enhance habitat values for the giant garter snake and other covered species. These managed marsh wetlands, together with associated uplands, rice fields, and water conveyance ditches and canals, are expected to form a mosaic of diverse wetland habitats in the wetland portion of the reserve system that will support giant garter snakes and other wetland associated species. Although it is unproven, there is good reason to believe that such managed marshes and their supporting delivery canal and ditch/drain infrastructure can support large populations of giant garter snakes, so long as their construction and management are guided by what is known (and what will be known in the future) about giant garter snake biology and the habitat features that are important to giant garter snake survival. Embedded within an agricultural landscape dominated by rice farming, managed marsh wetlands based on such biological principles should support giant garter snakes as well as many other covered species (e.g., white-faced ibis, tricolored blackbird, and northwestern pond turtle).

The specific locations where the NBC will develop managed marsh habitat are not identified in the NBHCP. Such lands will be identified as the NBHCP is implemented, and site-specific management and monitoring plans for each managed marsh area will be developed when the site is acquired. When the NBC proposes to acquire a particular land parcel as mitigation, it will submit the proposal to the USFWS and CDFG for review and approval as described in the Reserve Acquisition Methodology section above. Development of specific management and monitoring plans for managed marshes and other mitigation lands are discussed in Sections D and F, respectively of the NBHCP.

Similarly, the NBHCP does not provide site-specific prescriptions for marsh design and management, but outlines the basic habitat elements needed for managed marsh within the reserve system to support giant garter snakes and other covered species. It is important that these marsh elements, including the water regime and physical structure, are consistent with giant garter snake biology and that, to the extent known, they mimic relevant features of the

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original marsh complexes of the Central Valley where the giant garter snake evolved, or the rice culture ecosystem that currently supports the snake. These features include, but are not limited to: (1) summer dry-down of seasonal marsh; (2) availability of summer water either as pockets of deeper water that persist in the seasonal marsh or as permanent marsh, located near or adjacent to vegetated banks or suitable upland habitat; (3) availability of steep-sided, vegetated ditches or canals; (4) availability of abundant emergent vegetation and near shore habitat; (5) a good food supply; and (6) availability of diverse habitat elements.

The following describes these managed marsh components and other factors in more detail. Note, however, that the following descriptions for managed marsh design under the NBHCP (including water management and marsh configuration) may be modified throughout the life of the Plan according to its Adaptive Management provisions (see below). Marsh management plans will be developed in accordance with Section D below.

Water Regime: The NBHCP wetland reserves may consist of two types of managed marsh wetlands--seasonal wetlands or permanent wetlands. As its name implies, the first type is flooded seasonally to accomplish a variety of purposes, including benefits to wildlife and vegetation management. The season when such wetlands are flooded depends on the wildlife species being targeted (e.g., spring and summer for giant garter snakes; winter for waterfowl). Though seasonal marsh may have pockets of permanent water as described below, these are the result of deep water areas that are nevertheless within the seasonal wetland, and are therefore considered separately from permanent marsh. Permanent marsh retains its water year round, or at least is not subjected to seasonal manipulation on an annual basis, as is seasonal marsh.

Seasonal managed marshes will be flooded by about mid-March (if not flooded during the winter) so that water and prey are available when giant garter snakes emerge from winter retreats. Water will be drained off the marshes more or less coincident with the dry-down of the rice fields (approximately mid-August). The purpose of the dry-down is to: (1) mimic rice culture patterns known to support giant garter snakes, and the wetland patterns of historical garter snake habitats; (2) promote growth of certain wetland vegetation types (e.g., cattails); (3) reduce numbers of or eliminate large fish that are predators of giant garter snakes; (4) help concentrate giant garter snake prey species; and (5) create feeding and resting areas for other covered species as well as waterfowl (so long as waterfowl management is consistent with the purposes of the NBHCP). If marshes are designed correctly, dry-down will also result in pockets of permanent water that help support giant garter snakes and their prey through the summer months. Such pockets of permanent water will be an integral part of marsh designs developed for the reserves. However, where permanent pockets of water are included, they must be sufficiently close to vegetated canals, ditches, or suitable upland habitat to allow snakes to readily escape predators. Marsh designs that result in permanent water surrounded by bare mudflats must be avoided, since snakes in such waters would be highly vulnerable to predation.

Giant garter snakes are also known to use areas of permanent marsh. In initial studies by the BRD radio-telemetered giant garter snakes utilized permanent marshes extensively, although a low sample size and other variables prevent drawing final conclusions from this data as yet (Glenn Wylie, BRD, pers. comm.). Nevertheless, based on this data it is considered advantageous to include within the NBHCP wetland reserve system some areas of permanent

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marshes and sloughs interspersed with the seasonal marshes, rice fields, and uplands. This will increase the overall habitat diversity of the reserves for the giant garter snake as well as other covered species. Permanent marshes utilized by BRD-telemetered snakes are fairly small (e.g., borrow areas), have extensive emergent vegetation, and are fairly shallow (2-3 feet deep) (Wylie, BRD, pers. comm).

Uplands: While a portion of the terrestrial component of the managed marsh system will be designed to meet the buffer requirements of the NBHCP, the rest will be designed and managed to meet the needs of giant garter snakes and other covered species.

The NBHCP does not describe specific wetland habitat/upland habitat proportions for the wetland portion of the reserve system, but leaves such decisions to the NBC's Technical Advisory Committee under the provisions described in Sections D and E below. However, a typical proportion for upland habitats within the wetland reserves would be approximately 20 to 30 percent. Upland areas have several purposes: (1) providing basking and resting sites, escape cover and winter retreats for giant garter snakes; and (2) providing foraging and nesting areas for other covered species (e.g., loggerhead shrike, tricolored blackbird, burrowing owl, and Swainson's hawk). Upland areas under the NBHCP may consist of agricultural fields (especially with crops known to support Swainson's hawks--e.g., alfalfa), dryland pasture, grasslands, fallow fields, levees, and any other land use approved by the NBC's Technical Advisory Committee.

Giant garter snakes that have been flooded in their winter retreats are subject to many forms of mortality, or may be killed directly by drowning. Therefore, it is important that uplands in and around the reserve's managed marshes are designed so that a significant portion is above expected winter flood levels. They should also provide escape cover where the permanent pools of water described above may attract garter snakes as well as snake predators.

Water Conveyance Structures/Edge: Wherever possible, marsh management plans and design will maximize the area of interface between the terrestrial and aquatic components of the reserve system's managed marsh wetlands. This can be accomplished in several ways. A good model is the ditch/drain conveyance systems already extant in the rice-growing regions of the Basin. For example, edge area could be increased in the interior of the marsh by the construction of deep, steep-sided ditches separated by berms higher than the highest water level of the marsh. Because giant garter snakes are known to utilize the ditch/drain system in the Basin extensively, reserve management should also maximize the habitat value of these features to giant garter snakes within the reserve system, and, where applicable, on private lands (see Section 5.7.4 of the City of Sacramento's Implementation Agreement). Also, the construction of channels or ditches that are actually used as water conveyance structures or that mimic these structures should be encouraged. Edge effects can also be created through the design of the reserve's permanent water pools and uplands--i.e., by varying the shapes of pools, associated islands, ditches and drains, and uplands where these features interface.

*Vegetation/Cover: Vegetation in a managed marsh should support a diversity of wildlife. Plant species that currently occur in the emergent marsh habitat found in the Natomas Basin will be included in the NBHCP's managed marsh wetlands. These include cattails (*Typha latifolia*),*

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tules (*Scirpus acutus*), rushes (*Juncus* sp.), river bulrush (*S. fluvialtilis*), sedges (*Carex* sp., *Cyperus* sp.), and vervain (*Verbena hastata*). Marsh edges and "islands" should be well-vegetated with plants that discourage the movement of garter snake predators, such as herons, egrets, rats, and domestic animals. Plant species such as blackberry and thimbleberry are relatively impenetrable to many predator species but not to giant garter snakes and serve as basking sites for the snakes.

Exotic pest plants, such as giant reed grass and Johnson grass, can choke out native vegetation and have low habitat value. Such exotics will be periodically removed from the reserve system's managed marshes where feasible and necessary. Specific decisions about the need for exotic plant control shall be included in the management plan(s) for any given parcel or block of reserve land (see below, Section D).

Garter snakes utilize a variety of sites for escape cover and winter retreats, including small mammal burrows, thick vegetation such as blackberry and thimbleberry, and areas of jumbled rock such as rip rap, chunks of rock, or broken concrete. Management of wetland reserves under the NBHCP shall thus include protection and or construction of such types of giant garter snake cover and retreats as deemed appropriate by the NBC Technical Advisory Committee.

Access: Road kills are believed to be a significant giant garter snake mortality factor, especially for males (see Chapter II of NBHCP). Consequently, new roads within acquired reserve lands will be constructed to the minimum extent necessary to provide for the adequate maintenance of the marshes and other reserve lands. If roads already exist in an area acquired as a reserve, access to these roads will be restricted as necessary to protect the reserves from unnecessary disturbance and as described in the reserve management plans.

Other Factors: Soils are an important factor in designing and constructing managed marshes because they dictate whether water will be retained or lost through percolation. Generally, only those lands within the Natomas Basin that are underlain by clay soils will be conducive to the development of levee constructed managed marshes. Managed marshes must also be kept clear of winter storm runoff coming directly from urban areas. Pollutants such as petroleum compounds (e.g. motor oil) in urban runoff have been observed to cause respiratory and skin problems for the giant garter snake and may also reduce its food supply (George Hansen, pers. comm.). Water quality must also be maintained in order to maintain wildlife productivity and preclude the outbreak of wildlife diseases.

Water Control Structures: Managed marsh requires a controlled source of good quality water at suitable depths, usually less than three feet (water depth is important to the establishment of appropriate vegetation). Management and enhancement of managed marsh can be maximized through water control. A variety of water manipulation approaches can be utilized, including levees, stoplog and screwgate water control structures to regulate water flows and depths, and dewatering systems. In fact, a dewatering system is as important to successful wetland management as a flooding system. Water manipulation can also contribute to control of exotic plants and other undesirable vegetation.

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Levees constructed on natural contours have been found to be more effective for marsh management than levees constructed across contours. Generally, levees should be constructed to maximize the amount of flooded habitat.

Permanent or semipermanent impoundment levees will be used to create marsh which sets above the natural elevation of the land, much in the same way a bathtub holds water. Header-ditch levees are used along the upper elevation of a field or marsh to create the ditch or canal which brings water to the wetland. Water drops through control structures are then made through the header-ditch levee to the marsh or field. Rice-dike levees are used along natural contours in a rice field to back up water to flood the land. Depending upon the topography and the water conveyance and flooding regimes, the NBC will use a combination of these levee types to develop its marsh and rice wetlands.

Mosquito Control: Mosquito control programs operate throughout Natomas Basin. Generally, conventional mosquito control methods are not incompatible with garter snake habitat. Use of mosquito fish and low intensity pesticide applications would not directly threaten garter snakes or their habitat, and mosquito fish may actually serve as garter snake prey. However, mosquito control programs are more focused near urban areas, and the more intensive control methods there could harm giant garter snakes. If necessary the NBC should work directly with Mosquito Abatement Districts to determine suitable methods to resolve mosquito problems near urban areas in a manner consistent with the management of giant garter snake wetland habitats established under the NBHCP.

Summary: In summary, a good concept for a managed marsh wetland for giant garter snakes would be a mosaic of habitat types with variations in topography and an abundance of edges within and between habitat types. It would include seasonal marsh with shallow and deep water configurations; some permanent marsh; and upland habitats in the form of buffers, higher ground resembling the ditch banks and levees of the Basin's water conveyance system, and "islands" scattered throughout the marshes wetland component. Permanent water features would be constructed so that they ensure adequate nearby escape cover. A significant portion of the upland component would be above winter flood levels to protect giant garter snakes in their winter retreats. Vegetation would be natural marsh vegetation such as cattails, spike rush, tule clumps, and thimbleberry placed to maximize protected resting and basking sites and escape cover for the snakes.

In some cases, NBC may be able to acquire an historical marsh area that has been degraded but is undeveloped. In such cases, the best approach is likely to be restoration of the marsh rather than construction of new marsh. Nevertheless, to the extent applicable, the same principles and factors of marsh design and management as described above will guide marsh restoration activities where such restoration opportunities can be found, either in the Natomas Basin or in the out-of-Basin Area "B" as described above.

2,500-Acre/400-Acre Minimum Habitat Block Size Requirements

Conservation objectives described above for the giant garter snake require that one habitat block for the wetland reserve system be a minimum of 2,500 acres in size and the balance

of wetland reserve lands be in habitat blocks a minimum of 400 acres in size. However, the NBHCP recognizes that specific land use patterns and the potential problem of finding willing sellers in conformity with these requirements may create difficulty in fully satisfying this conservation objective. Consequently, if, after diligent efforts, the NBC is unable to acquire suitable habitat lands in the proper configuration or size to meet the objective, or if it appears that meeting the objective will be unlikely, the NBC shall undertake one or more of the following options, as appropriate: (1) consult with or request assistance from the local agency permittees to determine if there is any means to resolve the problem consistent with the terms of the NBHCP; (2) request review by the NBC Technical Advisory Committee to determine whether any new information on giant garter snake biology is available that is pertinent to the problem and that might suggest alternate habitat strategies; or (3) based on TAC recommendations resulting from number (2) above, or from other sources, request review of the requirements of this objective by the USFWS and CDFG to determine whether the requirements could be modified in any fashion consistent with land acquisition limitations that may be present in the Natomas Basin. Any revision of NBHCP requirements resulting from number (3) above would be adopted through the Plan's Adaptive Management provisions (Section E) or its 9,000-acre review process (Section I).

c. Management of Rice Lands for the Giant Garter Snake

As explained in Chapter II of the NBHCP, the rice growing areas of the Natomas Basin are known to support the giant garter snake (George Hansen, pers. comm.; Glenn Wylie, BRD, pers. comm.). For example, in its ongoing radio-telemetry studies, BRD has found that half of all garter snakes telemetered utilize rice fields at one time or another (Wylie, pers. comm.). The features of these rice lands that support garter snakes appear to include the rice fields themselves, the water conveyance system that supports the fields (including delivery canals, ditches, drains, and their associated levees) and other associated features such as tailwater marshes. The reasons giant garter snakes persist in this man-made rice culture ecosystem, and why some fields support snakes while others do not, are not fully understood (G. Hansen, pers. comm.). However, it may be because the rice fields, together with their supporting infrastructure, mimic to some extent the area's original marsh and upland habitats. It may also be because the water regime in the rice fields (spring and summer flooding and fall dry-down) coincides fairly closely with the biological needs of the species. The rice growing ecosystem also appears to provide many of the garter snake's basic habitat needs--e.g., warm, shallow water in the rice fields with sheltering emergent vegetation (i.e., rice plants); ditches and drains, some of which retain water year round and in which giant garter snake prey species (e.g., mosquito fish) can overwinter; and associated upland areas (e. g., levees) with suitable winter retreats.

In any case, the fact that giant garter snakes persist in the Natomas Basin's rice growing areas is well documented. The rice fields themselves support giant garter snakes through the active summer season, and the water conveyance systems that serve the rice fields support snakes throughout the year. The water conveyance systems in many parts of the Basin contain pockets of permanent water where prey such as bullfrog larvae and mosquitofish overwinter, resulting in high prey availability in the spring when snakes emerge from winter retreats and begin to use the aquatic components of the rice ecosystem. The late summer/early fall drydown of the rice fields may be important by removing predatory fish large enough to prey on giant

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garter snakes, and because giant garter snake prey, which have been proliferating in the ditches, drains, and rice fields, may be concentrated in the remaining pockets of standing water where snakes can gorge prior to the period of winter inactivity.

What is known about the relationship between rice farming and giant garter snakes is summarized above and in Chapter II. Additional studies are needed to better understand giant garter snake habitat needs, why and under what conditions giant garter snake populations persist where rice is farmed, and what types of reserve management would best benefit this species. Where appropriate, the results of such studies will be incorporated into the NBHCP through the Plan's Adaptive Management provisions (see below, Section E). Nevertheless, the NBHCP recognizes that: (1) continued rice farming in the Natomas Basin is beneficial to the giant garter snake; and (2) that maintaining rice farming on a significant portion of acquired NBC reserve lands is--unless otherwise indicated by the Giant Garter Snake Recovery Plan (see below, Section H), the Plan's monitoring and Adaptive Management programs (Sections F and E), or the 9,000-acre program review (Section I)--an integral component of the overall conservation strategy.

With respect to the selection of rice fields for inclusion in the NBHCP reserve system, and subsequent management, the following criteria shall be considered.

(1) Rice fields should be selected in areas that are within, or that have connectivity to, known giant garter snake populations or known occupied garter snake habitat.

(2) Rice fields located in areas that receive winter flooding should be avoided (e.g., the Yojo and Sutter Bypasses).

(3) Rice fields in the NBHCP reserve system should be managed to maximize giant garter snake compatibility. This includes maintenance of rice checks, berms, and other water control structures in as natural a state as practicable by limiting mowing or herbicide treatment, maintenance of garter snake prey species (e.g., mosquito fish) in or near the rice fields through appropriate management, and other measures as appropriate. However, any such management must also be compatible with economical rice production.

Specific measures for managing rice fields in the NBHCP wetland reserve system will be as determined by the NBC's Technical Advisory Committee and as described in reserve management plans (see below, Section D).

d. Out-of-Basin Reserves for Giant Garter Snakes

Most mitigation lands under the NBHCP will be situated inside the Plan area (80 %, currently). However, the Plan recognizes two potential out-of-Basin mitigation areas, shown in Figure 21 (in NBHCP), Potential Out-of-Basin Mitigation Area. Area "B" is a 60,000-acre area of agricultural land, north of the Basin, that is not currently known to support large populations of giant garter snakes, and its value for other species covered by the Plan has not been well documented. Areas "B" is not within the Natomas Basin; thus, take during development and rice farming activities in this area would not be covered by the NBHCP associated permits. However,

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any take associated with management and habitat enhancement in reserve areas within Areas "B" would be covered by the permits (see Chapter V, Section E. 1).

Under the NBHCP, an initial 800 acres of reserve lands must be established within the Natomas Basin. After that goal is achieved, the both Plans allow for up to 20 percent of the remaining reserve lands to be established in Area "B," if it can be demonstrated that a reserve of adequate size, viability, and habitat value can be established in this area and can support a population of giant garter snakes. Acquisition of reserve lands in Area "B" may occur if: (1) the NBC's Technical Advisory Committee, including its USFWS and CDFG representatives, concur unanimously in a decision to acquire reserve lands in Area "B" and the reasons for such decision are clearly documented in the NBC's administrative record; or (2) if not unanimous, the NBC submits a proposal for such an acquisition in writing to the USFWS and CDFG, together with an explanation of how and why the acquisition would benefit the reserve system or be consistent with reserve system objectives, and the USFWS and CDFG concur with the acquisition in writing.

If out-of-Basin reserve lands are acquired in Area "B" as described above, the NBC shall be responsible for managing such lands in accordance with Section D below, unless: (1) another reliable, willing reserve manager for such lands is located; (2) management of such lands by another land manager is consistent with all applicable conditions of the NBHCP; and (3) delegation of management authority to such a reserve manager is authorized by the USFWS and CDFG in writing.

The purpose of allowing out-of-Basin reserves is to potentially reduce the cost of establishing reserve areas by allowing acquisition of potentially lower-cost land, and to reduce the impact of NBC acquisitions on continuing farming in the Basin. However, at a minimum, such acquisitions must be consistent with the NBHCP's conservation objectives for the giant garter snake (see above, Section C. 1 .a) and wetland reserve acquisition criteria (see Section C. 1 .b). Out-Of-Basin acquisitions could actually benefit the giant garter snake overall through the creation of reserve lands for out-of-Basin giant garter snake populations, especially if key habitat areas for these populations could be protected via NBHCP funds.

In summary, it is currently expected that at least 80 percent of the NBHCP reserve lands will be established within the Natomas Basin. After an initial 800 acres of reserve land have been acquired in-Basin, up to 20 percent of the total mitigation lands required by the Plans may be acquired out-of-Basin.

3. Conservation Strategy for Upland Habitat Values

a. Conservation Objectives for the Swainson's Hawk

Swainson's hawk populations in the Central Valley are believed to have been reduced by approximately 90 % compared to historical levels. Approximately 24 pairs of Swainson's hawks nest annually within or immediately adjacent to the Natomas Basin along the Sacramento River. The Basin thus represents an important part of the remaining Swainson's hawk population in California, and protection of these hawks under the NBHCP is considered critical to

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maintenance of the Central Valley population of this species. Consequently, conservation objectives for the Swainson's hawk under the NBHCP are:

- (1) Retention and creation of sufficient quality nesting and foraging habitat to maintain existing Swainson's hawk population levels in the plan area, and allow for population increases to meet any future recovery goals (as defined by the forthcoming CDFG's Swainson's Hawk Recovery Plan).*
- (2) No net loss of nesting habitat within the Swainson's hawk zone. This zone is defined as a corridor beginning at the Sacramento River levee, extending eastward for one mile, and running from the intersection of the Sacramento River and Natomas Cross Canal in the north of the plan area to the intersection of the Sacramento River and the American River in the south (see Figure 11, Swainson's Hawk Records). For purposes of this objective, the Swainson's hawk zone shall be considered to include those Swainson's hawk nest trees that are outside of but immediately adjacent to the NBHCP plan area along the Sacramento River.*
- (3) Tracking of urban development proposals in the Swainson's hawk zone in order to minimize loss of foraging habitat within that zone.*
- (4) Acquisition or protection of sufficient foraging habitat to support breeding and successful fledging of young by hawks nesting within the Swainson's hawk zone (such protection could occur inside or outside the zone to achieve this purpose).*
- (5) Prevention of disturbance to and loss of Swainson's hawk nest trees throughout the plan area.*
- (6) Acquisition of habitat lands for Swainson's hawks within the Natomas Basin only (i.e., no out-of-Basin acquisitions for the Swainson's hawk is permitted under the Plan).*
- (7) Establishment of a tree planting program to provide for future Swainson's hawk nest trees. This can be done on NBC reserve lands and in coordination with Sacramento Area Flood Control Agency, RD 1000, and other agencies to establish new nest sites in the eastern portions of Natomas Basin (including, but not limited to, areas along the levees and Natomas East Main Drain). However, no trees will be planted within water conveyance or flood control ditches or canals where such plantings would interfere with the function of these facilities.*

b. Establishment and Management of Upland Reserves

Upland reserves are intended to provide for the long-term protection of existing and potential upland habitat in the Basin that currently supports or could support the Swainson's hawk and other upland species listed in Table I-1. In most cases, upland reserves established for the Swainson's hawk will also benefit other upland-associated covered species (e.g., the loggerhead shrike and burrowing owl). Consequently, selection of upland reserve sites will usually focus on the needs of the Swainson's hawk, except in cases where, in the judgement of the

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NBC and its Technical Advisory Committee, specific or important needs of other upland-associated species can be met at sites not selected primarily for Swainson's hawks.

Upland Reserve Acquisition Criteria/Methodology

The primary mitigation strategy for the Swainson's hawk under the NBHCP is the acquisition of upland reserves inside the Swainson's hawk zone. This will provide optimum nesting and foraging habitat for the hawk in the area where most nesting occurs within the plan area--along the Sacramento River. Minimum foraging habitat needed for Swainson's hawk nesting sites can vary depending on prey availability and density, which is in part a function of vegetation cover type within the foraging habitat and the activities (management practices, agricultural activities, etc.) associated with that habitat. The goal of this strategy is to maintain optimum nesting and foraging habitat for the hawks nesting in this zone. However, the Plan also calls for maintenance of nesting and foraging habitat for hawks nesting elsewhere in the Basin, as well as acquisition of reserve lands that benefit the other upland-associated species. In light of these considerations, upland reserve acquisition sites will be evaluated based upon the following criteria:

(1) The land contains known or potential Swainson's hawk nest trees, or includes or is adjacent to suitable foraging habitat (e.g., agricultural croplands and grasslands).

(2) Agricultural croplands and grasslands that, based on crop type or surveys, are expected to have a suitable Swainson's hawk prey base and, preferably, have historically been used by Swainson's hawks (as determined by NDDB or CDFG data and reports).

(3) The land is or can be used to grow crops conducive to Swainson's hawk foraging, including alfalfa and other hay crops, lightly grazed pasture, fallow fields, summer harvested row crops, but not cotton and other late harvest crops (see Chapter II, Section C.3.c).

(4) If possible, the land contains appropriate areas for the establishment of riparian woodland habitat, or isolated groves in agricultural fields, for future use by Swainson's hawks. Trees which may be planted include valley oaks, cottonwoods, willows, sycamores, and California walnut.

(5) Contiguity of upland reserve sites will be maximized. The Swainson's hawk conservation objectives above direct the NBC to focus acquisition of upland reserves in the Swainson's hawk zone. That objective, together with this provision, is intended to ensure that Swainson's hawk habitat protected in reserves will not be excessively fragmented, either inside the Swainson's hawk zone or outside the zone, and that habitat contiguity will be a primary criteria under which upland reserve sites will be selected.

(7) The land supports or has the potential to support other covered species which utilize upland habitat (see Tables I-1 and 11-4).

Generally, priority for acquiring upland reserve sites is as follows (in descending priority order): (1) sites located within the Swainson's hawk zone; (2) sites that, in the judgement of the

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NBC and its Technical Advisory Committee, would provide specific, important benefits to other upland-associated covered species (e.g., tricolored blackbird nesting colonies); (3) sites supporting Swainson's hawk nests or foraging habitat outside the Swainson's hawk zone; and (4) any other site that would result in a benefit to any upland covered species.

The NBC will monitor proposed development in the Swainson's hawk zone, where the majority of known Swainson's hawk nest sites are located and, hence, much of the Swainson's hawk nesting and foraging in the Basin occurs. Based on existing general plans, development in this zone is expected to be limited over the life of the Plan. However, if such development does occur, reserve lands established in mitigation for that development shall, likewise, be located within the Swainson's hawk zone. In addition, the NBC shall set as a top priority the acquisition of upland reserve sites in the Swainson's hawk zone (via easement or land purchase), irrespective of any specific development proposals in this area. Further, any reserve lands established in the Swainson's hawk zone shall, to the maximum extent possible, be managed to benefit all upland-associated covered species, though any management in this zone must be fully consistent with Swainson's hawk biology and needs.

In addition, wetland mitigation lands developed primarily for the giant garter snake and the wetland species will also contribute to Swainson's hawk needs. Recent observations by CDFG indicate that rice farming lands are also used by Swainson's hawks for foraging, particularly where there is vegetation at the perimeter of the fields (Dave Zezulak, pers. comm.). Also, all wetland reserves will have an upland component (see Section C. 1 .b above). Thus, wetland reserves, along with the upland reserves described above, will help offset habitat losses affecting the Swainson's hawk within the NBHCP plan area. Also, the upland component of wetland reserves will benefit some of the upland covered species, especially those that also have wetland habitat needs (e.g., the tricolored blackbird).

Specific plans for acquisition of upland habitat reserve lands will be determined by the NBC in consultation with its Technical Advisory Committee, by applying the objectives and criteria described above, and consistent with the requirements described in Section G.2 below (Phasing of Mitigation). Specific plans for management of these lands will be developed as described in Section D below (Management of Reserves).

Upland reserves will initially be designed to maintain existing Swainson's hawk populations and, where possible, to increase such populations through the tree planting program. However, such reserves will be re-designed, as necessary, to meet Swainson's Hawk recovery plan goals, once a Swainson's Hawk Recovery Plan is prepared and approved by CDFG. Specific measures for incorporating any future Swainson's Hawk Recovery Plan are described in Section E (Adaptive Management) and Section H (Program Adaptation for Recovery Plans) of the NBHCP.

Survey Activities

Some survey activities will be needed to guide upland reserve design and take avoidance efforts within the NBHCP plan area (see section C.2.c of the NBHCP). Information likely to be needed includes: (1) assessment of the numbers of Swainson's hawk breeding pairs in the

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NBHCP plan area, including nest sites along the Sacramento River as described under conservation objective (2) above; (2) assessment of annual nesting success; (3) identification of the locations of nest trees, both active and inactive, and the locations of potential nest trees (i.e. trees not known to be used that may be suitable for nesting if adjacent foraging habitat exists or was enhanced); (4) monitoring the status of any trees planted under the tree planting program; (5) estimates of prey densities found in various cover types in the Basin, especially within foraging distance of nesting areas along the Sacramento River; and (6) identification of agricultural fields that do or may provide suitable foraging habitat. Specific survey activities under this section will be determined by the NBC in consultation with its Technical Advisory Committee. These survey activities shall be in addition to those described in Section C.4 of the NBHCP and shall be coordinated with the survey requirements described in Section C.2.c of the NBHCP.

Please refer to the City of Sacramento version of the Natomas Basin Habitat Conservation Plan Chapters IV. D. Reserve Management/Management Plans, IV. E. Adaptive Management, IV. F. Biological Monitoring, IV. H. Program Adaption for Recovery Plans, and IV. I. NBHCP Program Review at 9,000 Acres of Development for additional information on how the NBC will implement the regional mitigation program under the NBHCP.

APPENDIX B

GIANT GARTER SNAKE STANDARD AVOIDANCE AND MINIMIZATION MEASURES TO BE CARRIED OUT DURING CONSTRUCTION ACTIVITIES IN THE METRO AIR PARK PROJECT AREA (March 1999)

Presence of giant garter snake (GGS) should be assumed. Surveys are required to determine where avoidance and minimization measures are appropriate. The following take avoidance and minimization measures for the giant garter snake are required by the USFWS to be carried out by permittees during construction activities in any areas that contain GGS habitat. These measures are subject to occasional revision, so check with the USFWS and/or the NBC Staff Biologist for current measures before proceeding with construction activities.

MEASURE: Within the Natomas Basin, all construction activity within GGS habitat is restricted to the period between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is reduced because snakes are expected to actively move away from danger. This window is timed to avoid spring GGS breeding and dispersal periods, and essential fall foraging and over-wintering periods, which is when the GGS is most vulnerable to take.

If construction cannot be scheduled between May 1 and October 1, contact the Sacramento Office of the USFWS and/or the NBC Staff Biologist to determine if additional measures are necessary to avoid and/or minimize take of GGS.

MEASURE: Pre-construction surveys for GGS must be carried out on all development projects. If any GGS habitat is found within a specific site, the following additional measures will be followed to minimize disturbance of habitat and harassment of GGS, unless they are specifically exempted by the USFWS.

MEASURE: Between April 15 and September 30th, all irrigation ditches, canals, or other aquatic habitat should be completely dewatered, with no puddled water remaining, for at least 15 consecutive days prior to the excavation or filling in of the dewatered habitat. Make sure dewatered habitat does not continue to support GGS prey, which could detain or attract snakes into the area. If a site cannot be completely dewatered, netting and salvage of prey items may be necessary. Further consultation with USFWS is required if waterways cannot be completely dewatered. This measure removes aquatic habitat component and allows GGS to leave on their own.

MEASURE: For sites that contain GGS habitat, no more than 24-hours prior to the start of construction activities, have a qualified biologist survey the project area for the presence of GGS. If construction activities stop on the project site for a period of two weeks or more, a new GGS survey should be completed no more than 24-hours prior to the re-start of construction activities.

MEASURE: Most GGS are found close to water (usually within 200 feet). In any areas where canals or ditches are to be preserved, avoid construction activities within 200 feet from the banks

APPENDIX B — GIANT GARTER SNAKE STANDARD AVOIDANCE AND MINIMIZATION MEASURES TO BE CARRIED OUT DURING CONSTRUCTION ACTIVITIES IN THE METRO AIR PARK PROJECT AREA (March 1999)

of this giant garter snake aquatic habitat. To minimize habitat disturbance, flag the corridor area and confine movement of heavy equipment to existing disturbed areas and roadways.

MEASURE: Confine clearing to the minimal area necessary to facilitate construction activities. Habitat that can be avoided should be cordoned off, clearly flagged, and designated as an "Environmentally Sensitive Area".

MEASURE: All construction personnel shall receive USFWS approved worker environmental awareness training. This training instructs workers on how to identify the GGS and its habitat, and what to do if a GGS is encountered during construction activities. During this training an on-site biological monitor shall be designated.

MEASURE: If a live GGS is found during construction activities, immediately notify the USFWS and the project's biological monitor. The biological monitor, or his assignee, should do the following:

1. Stop construction in the vicinity of the snake. Monitor the snake and give it a chance to leave on its own. If the snake does not show signs of leaving, then slowly move toward the snake to flush it toward adjacent habitat away from construction area. The monitor should remain in the area for the remainder of the work day to make sure the snake does not return. Escape routes for GGS should be determined in advance of construction and GGS should always be allowed to leave on their own. If a GGS does not leave on its own within 1 working day, further consultation with the USFWS is required.
2. Upon locating dead, injured or sick endangered or threatened wildlife species, the permittees or their designated agents must notify within 1 working day the Service's Division of Law Enforcement (2800 Cottage Way, Sacramento, California, 95825) or the Sacramento Fish and Wildlife Office (2800 Cottage Way, Room W-2650, Sacramento, California 95825, telephone 916-414-6600). Written notification to both offices must be made within 3 calendar days and must include the date, time, and location of the finding of a specimen and any other pertinent information.

MEASURE: Fill or construction debris may be used by GGS as an over-wintering site. Therefore, upon completion of construction activities remove any temporary fill and/or construction debris from the site. If this material is situated near undisturbed GGS habitat and it is to be removed between October 1 and May 1, it should be inspected by a qualified biologist to assure that GGS are not using it as hibernaculae.

APPENDIX C

BEST MANAGEMENT PRACTICES FOR RICE FARMING

Ricelands are composed of diverse habitat elements; the rice fields, tail water marshes, the ditch and drain components of the water conveyance system, delivery canals, and associated levees; all of which contribute structure and complexity to this man-made ecosystem. Irrigated rice and the vast network of irrigation ditches and canals in the Sacramento Valley provide some of the last remaining habitat for the giant garter snake (GGS). The GGS can survive in this artificial ecosystem because the spring and summer flooding and fall dry-down of rice culture coincides fairly closely with the biological needs of the species. The combined effects of having rice fields as part of the agricultural landscape, of keeping water in ditches, canals, and sloughs, is important in providing habitat for GGS. A combination of permanent marshes and appropriately managed rice fields would be a practical approach to maintaining GGS numbers.

Rice fields contain warm shallow water with sheltering emergent vegetation (i.e. rice plants) which is present within the fields during the spring-summer-early fall active season of the giant garter snake. This habitat, if managed properly, provides the GGS ease of movement, protection from detection by predators, warmth to aid metabolism, gestation, and digestion. The rice fields also function to produce populations of food organisms to sustain snake populations and may be important as nursery areas for young snakes. Emergent rice fields serve as refuges for snakes when adjacent ditches are drained or are denuded by weed control.

A study by Brode and Hansen in 1993 at Gilsizer slough, where rice was available next to a slough, the GGS were located in rice fields 19 to 20 percent of the time, in marsh habitat 20 to 23 percent, and in canal and agricultural waterway habitats 50 to 56 percent of the time. The Dixon Field Station of the U.S. Geological Survey, Biological Resources Division, studied the GGS in the Natomas Basin area of northern Sacramento County during 1998 and 1999. The study included habitats categorized as rice, ditch, slough/riparian, fallow field, and other. Where marsh-like habitat existed, but there was very little rice available, the snakes extensively used the slough habitat and seldom ventured into surrounded rice fields. At the site where rice fields were more prevalent (Elverta site) the snakes used rice fields when they became emergent habitat. Associated ditches and canals were important habitat even when rice fields were available and they proved the only habitat at other times. At the Elverta site 80-90% percent of the observations of the radio-marked snakes were in ditches with the remainder in rice fields. Snakes began to use rice fields shortly after vegetation emerged in late spring. In the summer, when rice fields were established as emergent habitat, snakes used them in approximately half of the observations; and they used ditches in the other half of the observations. Rice fields were used until early October when they were completely dewatered. GGS then used ditches which retained water the longest after rice harvest and overwintered in burrows high in the ditch banks. Giant garter snakes primarily used the edges of rice fields and checks, but the importance of the rice fields to GGS in the Natomas Basin should not be underestimated (Wylie 2000).

APPENDIX C – RICE FARMING

In the 1980's and early 1990's vegetative cover used to be markedly more abundant along ditch banks according to the long-term observations of George Hanson (Wylie 2000). Management for GGS can be improved by using a strategy of benign neglect; that is, to allow vegetative cover to grow along ditches, canals, and sloughs. Also, more habitat could be provided by maintaining water in drainage ditches for longer periods. Maintenance of water in ditches would be most important in the spring, after the snakes become active and before rice is planted, and in the fall, after the rice fields are drained and before the snakes enter dormancy. There is a great potential to enhance populations of GGS in the Natomas by appropriate habitat management and habitat creation. Existing rice agriculture could become better habitat for GGS if flood control and water conveyance agencies, and rice growers were to follow recommended low cost management guidelines. Therefore, flood control and water conveyance agencies, and rice growers have the opportunity to reduce take of GGS and maximize habitat values. These guidelines and methods are considered best management practices (BMPs).

The goals of following best management practices are to: 1) reduce mortality of GGS associated with management of ricelands; 2) maintain and enhance the value of existing habitat provided by rice lands; and 3) allow habitat elements to become established or reestablished to provide additional habitat that could support GGS. The USFWS realizes that some of the BMPs below may not be appropriate to implement in certain situations. The measures below provide several management options to meet the goals of the BMPs, but do not preclude use of other methods that may contribute to these goals. If the BMP's below cannot be implemented or if other methods are proposed, the USFWS recommends that the flood control and water conveyance agencies, and rice growers work with the USFWS to determine what site specific measures may be more appropriate.

BMPs may be subject to modification in the future. The flood control and water conveyance agencies, and rice growers should contact USFWS staff to obtain information on the most current BMPs.

Following is a list of BMPs that if employed would act to maximize GGS compatibility with rice farming and minimize GGS mortality:

1) Vegetation Management

Vegetation growing along ditch and canal banks is important shelter for the GGS. Vegetation should be allowed to grow on the rice check berms and perimeter levees and there should be a minimum of disturbance to ditch banks. Annual maintenance activities along ditches and canals, should maintain buffer strips of standing vegetation along the ditch and canal. The use of native grasses on canals and ditches is encouraged because the deep-rooted native grasses control erosion, require less weed maintenance, and excludes annual weedy species. Avoid vegetation management along canals and ditches whenever possible. If vegetation control is necessary for the movement of irrigation water then the following is a list of several different methods for that purpose: If vegetation control is used then it should be used only on one side of the ditch in any given year.

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- a. Mowing or Hand Removal. These are the preferred methods used to control terrestrial vegetation cover. Mowing vegetation growing along ditch banks from the top of the bank down to the water line should be avoided to the greatest extent practicable. If mowing is used to control terrestrial vegetation, the height of the vegetation after mowing should be at least 6-12 inches in height on top of and inside canal and ditch banks to the water line. Mowing to this height will minimize the risk that GGS will be killed or injured by mowing equipment and will leave some protective vegetative cover.
- b. Burning. Burning is a less preferable method of vegetation control than mowing. If burning is necessary then the most preferable time to burn is in late fall (after November 1). If burning is done in the spring, it should be done early enough so that the vegetation can recover by the time the snakes are active. This BMP does not exempt the operator from following any other state or county laws, regulations or ordinances regarding burning activities.
- c. Discing. Discing is also a less preferable method for vegetation control because of greater risk of injury to GGS and because underground retreats such as burrows and soil crevices may be destroyed. Discing should only be used during the active season of the snake, so the snakes can attempt to escape injury.
- d. Herbicides. Use of herbicides to control terrestrial and aquatic vegetation should be minimized to the greatest extent practicable, and use shall be consistent with manufacturer's recommendations and all other applicable laws and regulations. The use of Magnacide H (Acrolene) shall be limited to canals or ditches where such use has been approved by the California Department of Fish and Game. Spot treatment with herbicide is preferable over broad herbicide application.

2) Canal and Ditch Maintenance

- a. In those areas where GGS habitat occurs conduct ditch and canal maintenance between May 1 and October 1, where possible.
- b. Conduct maintenance from one side only in any given year. Alternate sides each year or if possible leave one side undisturbed indefinitely.
- c. For ditch and canal cleaning/dredging - Ditch and canal clearing or dredging should only be conducted when necessary to maintain flows or capacity. If it is not possible to retain vegetation on both ditch banks during excavation, vegetation should be maintained on one bank. When cleaning is necessary, remove vegetation or silt only below the water line, lifting the spoils straight up, and placing them away from the ditch banks to avoid disturbing the banks and burrows. Before filling an existing canal or ditch, the ditch or canal shall be de-watered for two weeks. This waiting period will allow any GGS in the vicinity to relocate to other areas and will lessen the risk of mortality to GGS. Ditches should only be filled between May 1 and October 1.

3) Minimize Vehicle Access

APPENDIX C – RICE FARMING

GGs are vulnerable to road kill death due to their habit of basking on ditch and canal banks, and access roads. GGs are most likely to bask on roadsides in the early spring and on cool mornings. In order to minimize the number of vehicular caused kill deaths:

- a. Restrict motor vehicle access and travel on and around the canals and ditches and rice fields to maintenance or other official vehicles. Movement of heavy equipment will be confined to existing roadways to the greatest extent practicable to minimize habitat disturbance.
- b. Exclude motorcycles and off-road vehicle activity along the edges of rice fields.
- c. Avoid putting new roads on levees immediately next to the water supply and drainage systems.
- d. Brief field hands on the importance of avoiding running over snakes with farm vehicles.
- e. Participate in any programs intended to minimize illegal trespass and vandalism in the rice fields.

4) Rodent Control

- a. Minimize rodent control as much as possible.
- b. Leave rodent burrows and soil crevices wherever possible to provide GGs retreats and wintering sites.
- c. Avoid discing or scraping canal and ditch banks which could remove burrows or trap or kill snakes.
- d. Rodent baits are preferred over fumigants as rodent control. When using approved fumigants for the control of rodents on canal and ditches, the water user shall follow instructions found on the label and any applicable State or Federal laws and regulations. In areas where there is GGs habitat, the use of fumigants to control rodents should be used only from May 1 to October 1.
- e. These guidelines do not prohibit other methods of rodent control. However, the flood control and water conveyance agencies, and rice growers should consult with the USFWS and CDFG to determine whether adverse impacts to GGs would be likely to occur and, if so, to develop suitable measures to reduce such impacts.

5) Public Safety and Health

Notwithstanding, the BMP's set forth above, it may be necessary and/or legally required of the water user to maintain water conveyance systems, including canals, ditches and levees, to

APPENDIX C – RICE FARMING

provide for public health and safety and/or property protection. In maintaining these irrigation facilities under these circumstances, full consideration where practical, will be given to consider feasible alternatives which may limit impacts to the GGS.

3. Publications

Flood control and water conveyance agencies, and rice growers should manage rice consistent with the production guidance provided in:

- a. *Integrated Pest Management for Rice*, Second Edition, published by the Regents of the University of California
- b. United States Environmental Protection Agency County Pesticide Interim Measures Bulletins
- c. The current University of California Pest Management Guidelines

These publications are designed to reduce impacts of pest control on non-target species. Also, all water users should follow all state and local regulations regarding chemical use.

Take resulting from pesticide (includes herbicides, rodenticides, fungicides, bio-controls) use is not a covered activity and remains subject to the state and federal endangered species acts and other federal and state regulations which apply to pesticide use.

APPENDIX D

MEMORANDUM ON THE NBHCP FEE BY EPS FOR THE NATOMAS BASIN CONSERVANCY



**Economic &
Planning Systems**
*Real Estate Economics
Regional Economics
Public Finance
Land Use Policy*

MEMORANDUM

To: John Roberts, *Natomas Basin Conservancy*
From: Tim Youmans, Georgette Lorenzen, and Allison Shaffer
Subject: Natomas Basin Habitat Conservation Plan; EPS #10175
Date: May 29, 2001

At the request of the Natomas Basin Conservancy (NBC) and the City of Sacramento, EPS has revised the Natomas Basin Habitat Conservation Plan (NBHCP) fee based on a number of factors that are detailed below. The proposed fee also takes into consideration the Agreement to Settle Litigation (or the "Settlement Agreement") adopted by the Sacramento City Council in May 2001 that allows for development of 1,668 acres.

As a result there are essentially two fee levels proposed: the Base fee, which is similar to the current NBHCP fee with noted changes as described below, and a second fee that is the Base fee plus a land acquisition premium that is intended to reflect the projected increase in land prices in zones where habitat acres are directed to be purchased as indicated in the Settlement Agreement.

Figure 1 below presents the proposed NBHCP fee including both the Base fee amount and the Base fee amount plus Settlement Land Acquisition (LA) Premium fee amount. The proposed fee level continues to assume the current HCP mitigation requirement of one half acre of mitigation land for each gross acre of developed land. Therefore the fee as shown reflects 50 percent of the cost per acre of habitat mitigation as shown in **Figure 1**. The Base Fee component and the Settlement LA Premium component are discussed in more detail below.

The Base fee is comprised of fee components for five funds: Land Acquisition (LA), Restoration and Enhancement (RE), Administration/O&M, O&M Endowment, and a Supplemental Endowment fund for land acquisition. The first four funds have historically been included in the NBHCP fee program. The fifth fund, Supplemental Endowment fund for land acquisition, is a newly recommended fund that will address judicial concerns regarding the ability of the NBC to purchase the last mitigation acres once all fees are paid. In other words, it will provide a contingency that will either allow the NBC to purchase mitigation acres in advance of requirements or provide a cushion in the case that land prices are higher than what the NBHCP fee allows for in acquisition costs.

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Sacramento, CA 95833-3647 Fax: 916-649-2070
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Phone: 510-841-9190 Phone: 303-575-8112
Fax: 510-841-9208 Fax: 303-623-1294

Figure 1
Proposed NBHCP Fee
Including the Settlement Land Acquisition Premium

Item	Cost per Acre of Habitat (a)	Mitigation Fee per Acre of Development (b) = (a) x 0.5
<u>Base Cost/Fee</u>		
Land Acquisition Cost (LA)		
Land Cost	\$4,750	\$2,375
Transaction Costs & Contingency	\$1,250	\$625
Total Land Acquisition Cost	\$6,000	\$3,000
Restoration/Enhancement (RE)	\$736	\$368
Administration/O&M	\$3,110	\$1,555
O&M Endowment Fund	\$1,600	\$800
Supplemental Endowment Fund	\$300	\$150
Fee Collection Administration (2%)		\$120
Subtotal	\$11,746	\$5,993
<u>Land Acquisition (LA) Premium</u>		
Land Acquisition Cost Premium		
Land Cost	\$6,250	\$3,125
Transaction Costs & Contingency	\$1,645	\$822
Fee Collection Administration (2%)		\$81
Subtotal LA Premium	\$7,895	\$4,028
Total		\$10,021

The following briefly describes the major revisions to the NBHCP Base fee.

NBHCP BASE FEE

The proposed Base fee is estimated based on an updated cash flow analysis prepared by EPS in connection with the revised HCP and preparation of the Environmental Impact Study (EIS). The cash flow analysis was last updated in July 2000. The Base fee cash flow analysis incorporates updates based on the revised HCP and other revisions such that the cash flow modeling more accurately reflects the experience and projected operations of the NBC. These updates include:

- **Rice Revenue Projections:** Rice revenues were modeled to more precisely match current estimates of projected revenue over the next two years.

- **Revised Administrative Cost Estimates:** Administrative costs were revised based on the current budget estimates of the NBHCP.
- **Fund Balance Adjustments:** The cash flow analysis was adjusted such that beginning balances in 2001 match actual fund balances of the NBHCP as of December 31, 2000.
- **Transfer from O&M/Admin to Restoration & Enhancement:** The HCP fee program, since conception, was structured to allow transfers of funds between the Land Acquisition, Restoration & Enhancement, and Administration/O&M funds based on any surpluses or deficits that might exist in those funds. Currently, the O&M/Administration fund has operating surpluses due to operating and administrative efficiencies of the NBC while the revenues for Restoration & Enhancement need to be supplemented over the next few years due to higher than anticipated restoration and enhancement costs for marsh lands. Not only is the cost to restore and enhance managed marsh significantly higher than the original plan estimated, it is also anticipated that managed marsh restoration and enhancement obligations will be far more intense and concentrated than provided in the original plan due to a more condensed period of development activity. Therefore, a transfer from the O&M/ Administration fund to the Restoration & Enhancement fund was assumed in 2003 and 2004 in the cash flow model.
- **Hunting Revenues:** The NBC has recently entered into a contract for the management of hunting operations on NBC lands. Based on projected revenues to the NBC from the providers of these services, projected hunting revenues were revised to reflect a more realistic projection of the likely net operating income. The current cash flow analysis assumes \$12 per hunting acre whereas the July 2000 update assumed hunting revenues of approximately \$37 per hunting acre.
- **Administrative Costs Post-Land Acquisition:** Previous versions of the financial analysis have assumed that administration costs would be reduced by 67 percent after all mitigation lands have been acquired. Based on discussions with the NBC and information provided by John Roberts, we have come to the conclusion that it is unrealistic to assume a significant decrease in administrative costs once all land acquisition has been completed. Therefore we have assumed a 15 percent reduction in administration costs. The reduction allows for a decrease in legal expenses, but leaves intact funding for most other administrative expenses. This revision to administration costs over the long term represents approximately a 20 percent increase in the Admin./O&M expenditures on an annual basis. However, the Admin./O&M fee is a relatively small component, approximately 16 percent, of the overall fee program including the Settlement Agreement Premium for land acquisition.
- **Acceleration of Fees Paid (Grading Permits Pulled):** Past cash flow model analyses have assumed a 50- year development absorption schedule for the 17,500 acres of planned development in the Natomas Basin. Historical development over the last three years has been substantially greater than anticipated by the original cash flow analysis. Given recent market trends, it is likely that development activity will continue to be at higher levels than originally projected. Even if the market slows, and as a result development activity also slows, there is a very high probability that developers will pull grading permits even if they do not plan to develop the property in the immediate future in order to avoid future delays in the permitting process due to the legal

challenges to the NBHCP fee. Therefore, the current cash flow analysis assumes a 15-year development period, during which grading permits are projected to be pulled and the NBHCP fees paid. Actual development may substantially lag the grading permit stage.

CASH FLOW ANALYSIS

The assumption tables for the cash flow analysis are presented in **Figure 2** through **Figure 4**. A summary of the cash flow analysis is shown in **Figure 5** and **Figure 6**. The detailed cash flow analysis is presented in **Appendix A**.

SETTLEMENT LAND ACQUISITION PREMIUM

The City of Sacramento and Sutter County are currently revising the Habitat Conservation Plan to address judicial findings made by United States District Court for the Eastern District of California. In order to allow some increment of development to occur prior to the ultimate resolution of the litigation, specified parties including the City of Sacramento, environmental interest groups, and certain developer groups have entered into the "Agreement to Settle Litigation" (the Settlement Agreement) as of May 15, 2001.

The Settlement Agreement allows for the City of Sacramento to issue "Urban Development Permits" that will allow grading on 1,668 acres within the Natomas Basin. Mitigation land acquisition can only be accomplished in restricted areas within the Natomas Basin. This will likely result in increased land cost, therefore necessitating higher fees. Based on recent comparable transactions in the areas or zones specified in the Settlement Agreement, it is estimated that the per acre cost for habitat land is approximately \$11,000 per acre. The Base Fee assumes \$4,750 per acre cost for habitat land. Therefore, the fee schedule proposed herein includes a premium of \$6,250 per acre for the cost of habitat land bringing the total land cost per habitat acre to \$11,000. Transaction costs and contingencies are then added to the estimated acquisition cost for a total cost per acre of habitat land of \$13,895. The Land Acquisition fee component is 50 percent of the cost per acre of habitat land based on the mitigation ratio of 0.5 acre of habitat to 1.0 acre of development.

The NBC currently has acquired 258 acres of mitigation lands in excess of the number of mitigation acres required to mitigate the impacts of development within the Natomas basin under grading permits issued by the City to date. Therefore, an additional 576 acres in particular zones as specified in the Settlement Agreement will need to be acquired.

Figure 2

Natomas Basin HCP

Land Acquisition and Restoration/Enhancements Cost
and Acquired Habitat Land Utilization Assumptions

Base Case

17,500 acres of development

1/2 acre of mitigation land per gross acre of developed land

25% marsh

Part A - Assumptions		Notes:	
Inflation	0.0%		
Interest Rate	3.0%		
Land Acquisition Values per Acre	Land Value	Permitted by Plan	Assumed in Financial Analysis
In-Basin Lands	\$4,750	80%	100%
Out-of-Basin Lands	\$3,000	20%	0%
Average Land Value (1)	\$4,750	Use In-Basin Land Value	
Plus Transaction Costs & Contingency	\$1,250	per Acre	
Average Land Acquisition Cost	\$6,000	per acquired acre	
Estimated Use of In-Basin Lands			
Marsh	25%		
Existing Rice	50%		
Other/Upland	25%		
Total Initial Use	100%		
Rice Converted to Marsh		After year 5, 324 acres in marsh 25% thereafter	
Rice Lands			
Uplands/Fallow	10%		
Leased for Other Crops	0%		
Leased Rice Base Land	90%		
Total Rice Lands	100%		
Initial Restoration/Enhancement	Use of Land	Initial Costs	Weighted Cost (\$)
Expended At Time Land Is Acquired			
Marsh (2)	0%	\$0	\$0
Existing Rice	75%	\$0	\$0
Dry Converted to Rice	0%	\$0	\$0
Other Upland	25%	\$0	\$0
Subtotal	100%		\$0
Expended At Time Land Is Converted			
Rice/Other Converted to Marsh	25%	\$2,482	\$621
Site Specific Plan Costs			\$116 per acre
Average Cost per Habitat Acre			\$736

assumptions1

Source: Natomas Basin Conservancy

- (1) Assumes all acquisition occurs at the average in-basin land value.
- (2) Initial use of marsh land estimated at 0% because NBHCP estimates that little to no marshland is available for acquisition. However, rice land will be converted to marsh land.
- (3) The initial costs of marsh, existing rice, dry land converted to rice and other upland have been set to zero as no initial restoration or enhancement costs are anticipated.
- (4) The current estimate of \$2,482 per acre is calculated from the May 2001 cost estimate of \$2.13 million for 858 acres and is based on creation/maintenance of habitat for the giant garter snake and the Swainson's hawk.
- (5) The cost of restoration and enhancement is weighted by the percent of acres assumed to be converted or used for that particular land use.

Figure 3
Natomas Basin HCP
Operations & Maintenance Assumptions

Base Case 17,500 acres of development 1/2 acre of mitigation land per gross acre of developed land 25% marsh
--

Part A - Assumptions Con't		Notes:
Operations & Maintenance Costs		
Marsh	\$281 per acre	Updated Cost -- May 2001
Upland/Fallow	\$18 per acre	Based on Wildlands, Inc. Estimates
Land Leased for Planted Rice Base	\$3 per acre	Based on Wildlands, Inc. Estimates
Land Leased for Other Crops	\$3 per acre	alfalfa, safflower, etc.
Other	\$0 per acre	
Hunting	\$0 per acre	Updated Cost -- May 2001
Misc./Monit./Adapt. Management	\$27 per acre	Based on Wildlands, Inc. Estimates
Special Assessment & Property Tax Costs		
<u>Sacramento County</u>		
Reclamation District #1000	\$13.1 per acre	Based on Existing Sacramento County Lands
NCMWA	\$0.4 per acre	Based on Existing Sacramento County Lands
SAFCA O&M Assessment #1	\$5.7 per acre	Based on Existing Sacramento County Lands
CSAI Safety Lights	\$0.1 per acre	Based on Existing Sacramento County Lands
Property Tax [1]	\$25.6 per acre	Assumes average assessed value of land at \$2,400 per acre
Subtotal Sacramento County	\$45 per acre	
<u>Sutter County</u>		
Reclamation District #1000	\$13.1 per acre	
NCMWC	\$0.4 per acre	
Property Tax	\$24.0 per acre	Assumes average assessed value of land at \$2,400 per acre
Subtotal Sutter County	\$37 per acre	
Administrative Costs		
During Development	\$447,695 per year	Figure 5 for detail
After All Land Acquired	\$380,541 per year	phased in over 3- 5 years
Operations & Maintenance Revenues		
Crop Land Leases		
<u>Through 2002</u>		
Planted Rice Base Acreage	\$160 per acre/year	normal ag. practices \$135 - \$210 range
Other Crops (Flex. acreage)	\$80 per acre/year	normal ag. practices \$75 - \$100 range
<u>2003 +</u>		
Planted Rice Base Acreage	\$160 per acre/year	normal ag. practices \$135 - \$210 range
Other Crops (Flex. acreage)	\$80 per acre/year	normal ag. practices \$75 - \$100 range
Hunting		
Hunting Revenue per Acre	\$12 per acre	Based on Wildlands Estimate for initial Site Plan

"assumptions2"

Source: Natomas Basin Conservancy

[1 Includes G.O. bond assessment.

Figure 4
Natomas Basin HCP
Estimated Annual Natomas Basin Conservancy (NBC) Administrative Costs

	Annual Cost	Notes
<u>Administrative Expenses</u>		
Staff	\$150,000	
Benefits	\$49,500	
Board Expense	\$6,000	
Subtotal	\$205,500	
<u>Office Expense</u>		
Rent	\$15,000	
Telephone	\$1,700	
Copying & Printing	\$16,000	
Office Supplies	\$5,000	
Postage	\$600	
Equipment	\$2,500	
Auto Expense	\$6,500	
Subtotal	\$47,300	
<u>Miscellaneous Expense</u>		
Insurance	\$23,000	Liability and E&O
Accounting	\$16,500	
Legal	\$60,000	
Corporate Taxes	\$1,000	
Subtotal	\$100,500	
Contract Work/ Public Education/ Publications/Monitoring/Reports, etc.	\$36,000	
Subtotal Costs	\$389,300	
Contingency	\$58,395	15% Contingency
Total Administration During Habitat Acquisition Phase	\$447,695	
Total Administration After Habitat Acquisition	\$380,541	[1]

"admin"

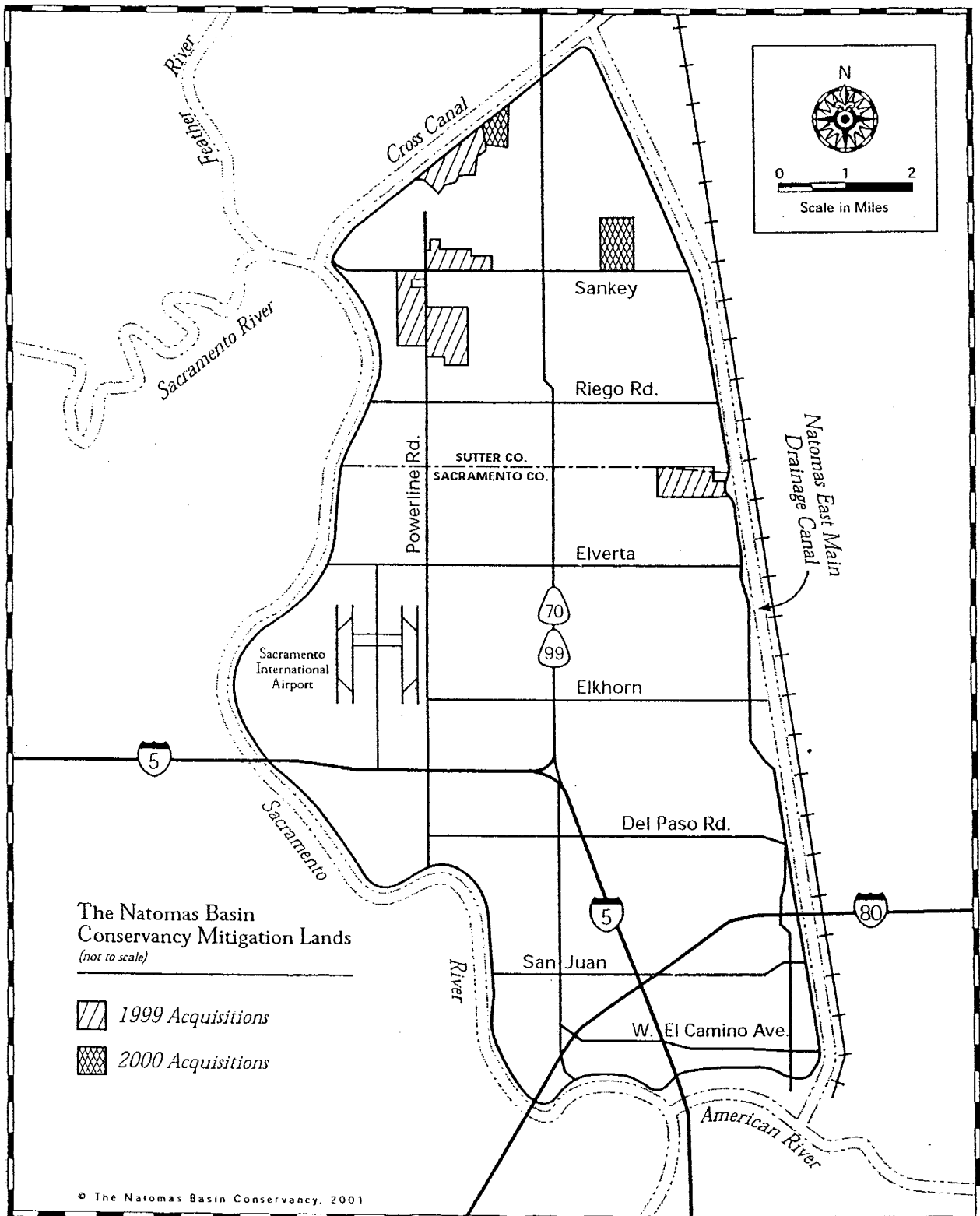
Source: NBC FY 2001 budget estimate

[1] Administrative costs are reduced by 15% after all habitat lands have been acquired.

THE NATOMAS BASIN CONSERVANCY

2001

Base Map



APPENDIX E

**RECOMMENDED TIMING AND METHODOLOGY FOR
SWAINSON'S HAWK NESTING SURVEYS IN
CALIFORNIA'S CENTRAL VALLEY**

BY THE SWAINSON'S HAWK TECHNICAL ADVISORY COMMITTEE

RECOMMENDED TIMING AND METHODOLOGY FOR SWAINSON'S HAWK NESTING SURVEYS IN CALIFORNIA'S CENTRAL VALLEY

Swainson's Hawk Technical Advisory Committee

May 31, 2000

This set of survey recommendations was developed by the Swainson's Hawk Technical Advisory Committee (TAC) to maximize the potential for locating nesting Swainson's hawks, and thus reducing the potential for nest failures as a result of project activities/disturbances. The combination of appropriate surveys, risk analysis, and monitoring has been determined to be very effective in reducing the potential for project-induced nest failures. As with most species, when the surveyor is in the right place at the right time, Swainson's hawks may be easy to observe; but some nest sites may be very difficult to locate, and even the most experienced surveyors have missed nests, nesting pairs, mis-identified a hawk in a nest, or believed incorrectly that a nest had failed. There is no substitute for specific Swainson's hawk survey experience and acquiring the correct search image.

METHODOLOGY

Surveys should be conducted in a manner that maximizes the potential to observe the adult Swainson's hawks, as well as the nest/chicks second. To meet the California Department of Fish and Game's (CDFG) recommendations for mitigation and protection of Swainson's hawks, surveys should be conducted for a ½ mile radius around all project activities, and if active nesting is identified within the ½ mile radius, consultation is required. In general, the TAC recommends this approach as well.

Minimum Equipment

Minimum survey equipment includes a high-quality pair of binoculars and a high quality spotting scope. Surveying even the smallest project area will take hours, and poor optics often result in eye-strain and difficulty distinguishing details in vegetation and subject birds. Other equipment includes good maps, GPS units, flagging, and notebooks.

Walking vs Driving

Driving (car or boat) or "windshield surveys" are usually preferred to walking if an adequate roadway is available through or around the project site. While driving, the observer can typically approach much closer to a hawk without causing it to fly. Although it might appear that a flying bird is more visible, they often fly away from the observer using trees as screens, and it is difficult to determine from where a flying bird came. Walking surveys are useful in locating a nest after a nest territory is identified, or when driving is not an option.

Angle and Distance to the Tree

Surveying subject trees from multiple angles will greatly increase the observer's chance of detecting a nest or hawk, especially after trees are fully leafed and when surveying multiple trees

in close proximity. When surveying from an access road, survey in both directions. Maintaining a distance of 50 meters to 200 meters from subject trees is optimal for observing perched and flying hawks without greatly reducing the chance of detecting a nest/young. Once a nesting territory is identified, a closer inspection may be required to locate the nest.

Speed

Travel at a speed that allows for a thorough inspection of a potential nest site. Survey speeds should not exceed 5 miles per hour to the greatest extent possible. If the surveyor must travel faster than 5 miles per hour, stop frequently to scan subject trees.

Visual and Aural Ques

Surveys will be focused on both observations and vocalizations. Observations of nests, perched adults, displaying adults, and chicks during the nesting season are all indicators of nesting Swainson's hawks. In addition, vocalizations are extremely helpful in locating nesting territories. Vocal communication between hawks is frequent during territorial displays; during courtship and mating; through the nesting period as mates notify each other that food is available or that a threat exists; and as older chicks and fledglings beg for food.

Distractions

Minimize distractions while surveying. Although two pairs of eyes may be better than one pair at times, conversation may limit focus. Radios should be off; not only are they distracting, they may cover a hawk's call.

Notes and Species Observed

Take thorough field notes. Detailed notes and maps of the location of observed Swainson's hawk nests are essential for filling gaps in the Natural Diversity Data Base; please report all observed nest sites. Also document the occurrence of nesting great horned owls, red-tailed hawks, red-shouldered hawks and other potentially competitive species. These species will infrequently nest within 100 yards of each other, so the presence of one species will not necessarily exclude another.

TIMING

To meet the minimum level of protection for the species, surveys should be completed for at least the two survey periods immediately prior to a project's initiation. For example, if a project is scheduled to begin on June 20, you should complete 3 surveys in Period III and 3 surveys in Period V. However, it is always recommended that surveys be completed in Periods II, III and V. Surveys should not be conducted in Period IV.

The survey periods are defined by the timing of migration, courtship, and nesting in a "typical" year for the majority of Swainson's hawks from San Joaquin County to Northern Yolo County. Dates should be adjusted in consideration of early and late nesting seasons, and geographic differences (northern nesters tend to nest slightly later, etc). If you are not sure, contact a TAC member or CDFG biologist.

Survey dates Justification and search image	Survey time	Number of Surveys
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I. <i>January-March 20 (recommended/optional)</i>	<i>All day</i>	<i>1</i>
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Prior to Swainson's hawks returning, it may be helpful to survey the project site to determine potential nest locations. Most nests are easily observed from relatively long distances, giving the surveyor the opportunity to identify potential nest sites, as well as becoming familiar with the project area. It also gives the surveyor the opportunity to locate and map competing species nest sites such as great horned owls from February on, and red-tailed hawks from March on. After March 1, surveyors are likely to observe Swainson's hawks staging in traditional nest territories.

II. <i>March 20 to April 5</i>	<i>Sunrise to 1000 1600 to sunset</i>	<i>3</i>
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Most Central Valley Swainson's hawks return by April 1, and immediately begin occupying their traditional nest territories. For those few that do not return by April 1, there are often hawks ("floaters") that act as place-holders in traditional nest sites; they are birds that do not have mates, but temporarily attach themselves to traditional territories and/or one of the site's "owners." Floaters are usually displaced by the territories' owner(s) if the owner returns.

Most trees are leafless and are relatively transparent; it is easy to observe old nests, staging birds, and competing species. The hawks are usually in their territories during the survey hours, but typically soaring and foraging in the mid-day hours. Swainson's hawks may often be observed involved in territorial and courtship displays, and circling the nest territory. Potential nest sites identified by the observation of staging Swainson's hawks will usually be active territories during that season, although the pair may not successfully nest/reproduce that year.

III. <i>April 5 to April 20</i>	<i>Sunrise to 1200 1630 to Sunset</i>	<i>3</i>
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Although trees are much less transparent at this time, activity at the nest site increases significantly. Both males and females are actively nest building, visiting their selected site frequently. Territorial and courtship displays are increased, as is copulation. The birds tend to vocalize often, and nest locations are most easily identified. This period may require a great deal of "sit and watch" surveying.

IV. <i>April 21 to June 10</i>	<i>Monitoring known nest sites only Initiating Surveys is not recommended</i>	
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Nests are extremely difficult to locate this time of year, and even the most experienced surveyor will miss them, especially if the previous surveys have not been done. During this phase of nesting, the female Swainson's hawk is in brood position, very low in the nest, laying eggs, incubating, or protecting the newly hatched and vulnerable chicks; her head may or may not be visible. Nests are often well-hidden, built into heavily vegetated sections of trees or in clumps of mistletoe, making them all but invisible. Trees are usually not viewable from all angles, which may make nest observation impossible.

Following the male to the nest may be the only method to locate it, and the male will spend hours away from the nest foraging, soaring, and will generally avoid drawing attention to the nest site. Even if the observer is fortunate enough to see a male returning with food for the female, if the female determines it is not safe she will not call the male in, and he will not approach the nest; this may happen if the observer, or others, are too close to the nest or if other threats, such as rival hawks, are apparent to the female or male.

V. *June 10 to July 30 (post-fledging)*

Sunrise to 1200

3

1600 to sunset

Young are active and visible, and relatively safe without parental protection. Both adults make numerous trips to the nest and are often soaring above, or perched near or on the nest tree. The location and construction of the nest may still limit visibility of the nest, young, and adults.

APPENDIX F

**CONSERVATION GUIDELINES FOR THE
VALLEY ELDERBERRY LONGHORN BEETLE**

BY THE U.S. FISH AND WILDLIFE SERVICE

Conservation Guidelines for the Valley Elderberry Longhorn Beetle

9 July 1999

The following guidelines have been issued by the U.S. Fish and Wildlife Service (Service) to assist Federal agencies and non-federal project applicants needing incidental take authorization through a section 7 consultation or a section 10(a)(1)(B) permit in developing measures to avoid and minimize adverse effects on the valley elderberry longhorn beetle. The Service will revise these guidelines as needed in the future. The most recently issued version of these guidelines should be used in developing all projects and habitat restoration plans. The survey and monitoring procedures described below are designed to avoid any adverse effects to the valley elderberry longhorn beetle. Thus a recovery permit is not needed to survey for the beetle or its habitat or to monitor compensation areas. If you are interested in a recovery permit for research purposes please call the Service's Regional Office at (503) 231-2063.

Background Information

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), was listed as a threatened species on August 8, 1980 (*Federal Register* 45: 52803-52807). This animal is fully protected under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The valley elderberry longhorn beetle (beetle) is completely dependent on its host plant, elderberry (*Sambucus* species), which is a common component of the remaining riparian forests and adjacent upland habitats of California's Central Valley. Use of the elderberry by the beetle, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the elderberry's use by the beetle is an exit hole created by the larva just prior to the pupal stage. The life cycle takes one or two years to complete. The animal spends most of its life in the larval stage, living within the stems of an elderberry plant. Adult emergence is from late March through June, about the same time the elderberry produces flowers. The adult stage is short-lived. Further information on the life history, ecology, behavior, and distribution of the beetle can be found in a report by Barr (1991) and the recovery plan for the beetle (USFWS 1984).

Surveys

Proposed project sites within the range of the valley elderberry longhorn beetle should be surveyed for the presence of the beetle and its elderberry host plant by a qualified biologist. The beetle's range extends throughout California's Central Valley and associated foothills from about the 3,000-foot elevation contour on the east and the watershed of the Central Valley on the west (Figure 1). All or portions of 31 counties are included: Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Madera, Mariposa, Merced, Napa, Nevada, Placer, Sacramento, San Benito, San Joaquin, San Luis Obispo, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba.

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If elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level occur on or adjacent to the proposed project site, or are otherwise located where they may be directly or indirectly affected by the proposed action, compensation is required (refer to Table 1). Elderberry plants with no stems measuring 1.0 inch or greater in diameter at ground level are unlikely to be habitat for the beetle because of their small size and/or immaturity. Therefore, no compensation is required for removal of elderberry plants with no exit holes and no stems measuring 1.0 inch or greater in diameter at ground level. Surveys are valid for a period of two years.

Avoid and Protect Habitat Whenever Possible

Project sites that do not contain beetle habitat are preferred. If suitable habitat for the beetle occurs on the project site, or within close proximity where beetles will be affected by the project, these areas must be designated as avoidance areas and must be protected from disturbance during the construction and operation of the project. When possible, projects should be designed such that avoidance areas are connected with adjacent habitat to prevent fragmentation and isolation of beetle populations. Any beetle habitat that cannot be avoided as described below should be considered impacted and appropriate minimization and compensation measures should be proposed as described below.

Avoidance: Establishment and Maintenance of a Buffer Zone

Complete avoidance (i.e., no adverse effects) may be assumed when a 100-foot (or wider) buffer is established and maintained around elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level. Firebreaks may not be included in the buffer zone. In buffer areas construction-related disturbance should be minimized, and any damaged area should be promptly restored following construction. The Service must be consulted before any disturbances within the buffer area are considered. In addition, the Service must be provided with a map identifying the avoidance area and written details describing avoidance measures.

Protective Measures

1. Fence and flag all areas to be avoided during construction activities. In areas where encroachment on the 100-foot buffer has been approved, provide a minimum setback of at least 20 feet from the dripline of each elderberry plant.
2. Brief contractors on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements.
3. Erect signs every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.

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4. Instruct work crews about the status of the beetle and the need to protect its elderberry host plant.

Restoration and Maintenance

1. Restore any damage done to the buffer area (area within 100 feet of elderberry plants) during construction. Provide erosion control and re-vegetate with appropriate native plants.
2. Buffer areas must continue to be protected after construction from adverse effects of the project. Measures such as fencing, signs, weeding, and trash removal are usually appropriate.
3. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant should be used in the buffer areas, or within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or greater in diameter at ground level.
4. The applicant must provide a written description of how the buffer areas are to be restored, protected, and maintained after construction is completed.
5. Mowing of grasses/ground cover may occur from July through April to reduce fire hazard. No mowing should occur within five (5) feet of elderberry plant stems. Mowing must be done in a manner that avoids damaging plants (e.g., stripping away bark through careless use of mowing/trimming equipment).

Transplant Elderberry Plants That Cannot Be Avoided

Elderberry plants must be transplanted if they can not be avoided by the proposed project. All elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level must be transplanted to a compensation area (see below). At the Service's discretion, a plant that is unlikely to survive transplantation because of poor condition or location, or a plant that would be extremely difficult to move because of access problems, may be exempted from transplantation. In cases where transplantation is not possible the compensation ratios in Table 1 may be increased to offset the additional habitat loss.

Trimming of elderberry plants (e.g., pruning along roadways, bike paths, or trails) with one or more stems 1.0 inch or greater in diameter at ground level, may result in take of beetles. Therefore, trimming is subject to appropriate compensation as outlined in Table 1.

1. Monitor. A qualified biologist (monitor) must be on-site for the duration of the transplanting of the elderberry plants to insure that no unauthorized take of the valley elderberry longhorn beetle occurs. If unauthorized take occurs, the monitor must have the authority to stop work until corrective measures have been completed. The monitor must immediately report any unauthorized take of the beetle or its habitat to the Service and to the California Department of Fish and Game.

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2. Timing. Transplant elderberry plants when the plants are dormant, approximately November through the first two weeks in February, after they have lost their leaves. Transplanting during the non-growing season will reduce shock to the plant and increase transplantation success.
3. Transplanting Procedure.
 - a. Cut the plant back 3 to 6 feet from the ground or to 50 percent of its height (whichever is taller) by removing branches and stems above this height. The trunk and all stems measuring 1.0 inch or greater in diameter at ground level should be replanted. Any leaves remaining on the plant should be removed.
 - b. Excavate a hole of adequate size to receive the transplant.
 - c. Excavate the plant using a Vermeer spade, backhoe, front end loader, or other suitable equipment, taking as much of the root ball as possible, and replant immediately at the compensation area. Move the plant only by the root ball. If the plant is to be moved and transplanted off site, secure the root ball with wire and wrap it with burlap. Dampen the burlap with water, as necessary, to keep the root ball wet. Do not let the roots dry out. Care should be taken to ensure that the soil is not dislodged from around the roots of the transplant. If the site receiving the transplant does not have adequate soil moisture, pre-wet the soil a day or two before transplantation.
 - d. The planting area must be at least 1,800 square feet for each elderberry transplant. The root ball should be planted so that its top is level with the existing ground. Compact the soil sufficiently so that settlement does not occur. As many as five (5) additional elderberry plantings (cuttings or seedlings) and up to five (5) associated native species plantings (see below) may also be planted within the 1,800 square foot area with the transplant. The transplant and each new planting should have its own watering basin measuring at least three (3) feet in diameter. Watering basins should have a continuous berm measuring approximately eight (8) inches wide at the base and six (6) inches high.
 - e. Saturate the soil with water. Do not use fertilizers or other supplements or paint the tips of stems with pruning substances, as the effects of these compounds on the beetle are unknown.
 - f. Monitor to ascertain if additional watering is necessary. If the soil is sandy and well-drained, plants may need to be watered weekly or twice monthly. If the soil is clayey and poorly-drained, it may not be necessary to water after the initial saturation. However, most transplants require watering through the first summer. A drip watering system and timer is ideal. However, in situations where this is not possible, a water truck or other apparatus may be used.

Plant Additional Seedlings or Cuttings

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Each elderberry stem measuring 1.0 inch or greater in diameter at ground level that is adversely affected (i.e., transplanted or destroyed) must be replaced, in the compensation area, with elderberry seedlings or cuttings at a ratio ranging from 1:1 to 8:1 (new plantings to affected stems).

Compensation ratios are listed and explained in Table 1. Stock of either seedlings or cuttings should be obtained from local sources. Cuttings may be obtained from the plants to be transplanted if the project site is in the vicinity of the compensation area. If the Service determines that the elderberry plants on the proposed project site are unsuitable candidates for transplanting, the Service may allow the applicant to plant seedlings or cuttings at higher than the stated ratios in Table 1 for each elderberry plant that cannot be transplanted.

Plant Associated Native Species

Studies have found that the beetle is more abundant in dense native plant communities with a mature overstory and a mixed understory. Therefore, a mix of native plants associated with the elderberry plants at the project site or similar sites will be planted at ratios ranging from 1:1 to 2:1 [native tree/plant species to each elderberry seedling or cutting (see Table 1)]. These native plantings must be monitored with the same survival criteria used for the elderberry seedlings (see below). Stock of saplings, cuttings, and seedlings should be obtained from local sources. If the parent stock is obtained from a distance greater than one mile from the compensation area, approval by the Service of the native plant donor sites must be obtained prior to initiation of the revegetation work. Planting or seeding the compensation area with native herbaceous species is encouraged. Establishing native grasses and forbs may discourage unwanted non-native species from becoming established or persisting at the compensation area. Only stock from local sources should be used.

Examples

Example 1

The project will adversely affect beetle habitat on a vacant lot on the land side of a river levee. This levee now separates beetle habitat on the vacant lot from extant Great Valley Mixed Riparian Forest (Holland 1986) adjacent to the river. However, it is clear that the beetle habitat located on the vacant lot was part of a more extensive mixed riparian forest ecosystem extending farther from the river's edge prior to agricultural development and levee construction. Therefore, the beetle habitat on site is considered riparian. A total of two elderberry plants with at least one stem measuring 1.0 inch or greater in diameter at ground level will be affected by the proposed action. The two plants have a total of 15 stems measuring over 1.0 inch. No exit holes were found on either plant. Ten of the stems are between 1.0 and 3.0 inches in diameter and five of the stems are greater than 5.0 inches in diameter. The compensation area is suited for riparian forest habitat. Associated natives adjacent to the compensation area are box elder (*Acer negundo californica*), walnut (*Juglans californica* var. *hindsii*), sycamore (*Platanus racemosa*), cottonwood (*Populus fremontii*), willow (*Salix gooddingii* and *S. laevigata*), white alder (*Alnus rhombifolia*), ash (*Fraxinus latifolia*), button willow (*Cephalanthus occidentalis*), and wild grape (*Vitis californica*).

Compensation (based on ratios in Table 1):

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- Transplant the two elderberry plants that will be affected to the compensation area.
 - Plant 40 elderberry rooted cuttings (10 affected stems compensated at 2:1 ratio and 5 affected stems compensated at 4:1 ratio, cuttings planted:stems affected)
 - Plant 40 associated native species (ratio of associated natives to elderberry plantings is 1:1 in areas with no exit holes):
 - 5 saplings each of box elder, sycamore, and cottonwood
 - 5 willow seedlings
 - 5 white alder seedlings
 - 5 saplings each of walnut and ash
 - 3 California button willow
 - 2 wild grape vines
- Total: 40 associated native species
- Total area required is a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. Since, a total of 80 plants must be planted (40 elderberries and 40 associated natives), a total of 0.33 acre (14,400 square feet) will be required for compensation plantings. The compensation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period.

Example 2

The project will adversely affect beetle habitat in Blue Oak Woodland (Holland 1986). One elderberry plant with at least one stem measuring 1.0 inch or greater in diameter at ground level will be affected by the proposed action. The plant has a total of 10 stems measuring over 1.0 inch. Exit holes were found on the plant. Five of the stems are between 1.0 and 3.0 inches in diameter and five of the stems are between 3.0 and 5.0 inches in diameter. The compensation area is suited for elderberry savanna (non-riparian habitat). Associated natives adjacent to the compensation area are willow (*Salix* species), blue oak (*Quercus douglasii*), interior live oak (*Q. wislizenii*), sycamore, poison oak (*Toxicodendron diversilobum*), and wild grape.

Compensation (based on ratios in Table 1):

- Transplant the one elderberry plant that will be affected to the compensation area.
- Plant 30 elderberry seedlings (5 affected stems compensated at 2:1 ratio and 5 affected stems compensated at 4:1 ratio, cuttings planted:stems affected)
- Plant 60 associated native species (ratio of associated natives to elderberry plantings is 2:1 in areas with exit holes):
 - 20 saplings of blue oak, 20 saplings of sycamore, and 20 saplings of willow, and seed and plant with a mixture of native grasses and forbs

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- Total area required is a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. Since, a total of 90 plants must be planted (30 elderberries and 60 associated natives), a total of 0.37 acre (16,200 square feet) will be required for compensation plantings. The compensation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period.

Compensation Area—Provide Habitat for the Beetle in Perpetuity

The compensation area is distinct from the avoidance area (though the two may adjoin), and serves to receive and protect the transplanted elderberry plants and the elderberry and other native plantings. The Service may accept proposals for off-site compensation areas where appropriate.

1. **Size.** The compensation area must provide at least 1,800 square feet for each transplanted elderberry plant. As many as 10 compensation plantings (i.e., elderberry cuttings or seedlings and/or associated native plants) may be planted within the 1800 square foot area with each transplanted elderberry. An additional 1,800 square feet shall be provided for every additional 10 compensation plants. Each planting should have its own watering basin measuring approximately three feet in diameter. Watering basins should be constructed with a continuous berm measuring approximately eight inches wide at the base and six inches high.

The planting density specified above is primarily for riparian forest habitats or other habitats with naturally dense cover. If the compensation area is an open habitat (i.e., elderberry savanna, oak woodland) more area may be needed for the required plantings. Contact the Service for assistance if the above planting recommendations are not appropriate for the proposed compensation area.

No area to be maintained as a firebreak may be counted as compensation area. Like the avoidance area, the compensation area should connect with adjacent habitat wherever possible, to prevent isolation of beetle populations.

Depending on adjacent land use, a buffer area may also be needed between the compensation area and the adjacent lands. For example, herbicides and pesticides are often used on orchards or vineyards. These chemicals may drift or runoff onto the compensation area if an adequate buffer area is not provided.

2. **Long-Term Protection.** The compensation area must be protected in perpetuity as habitat for the valley elderberry longhorn beetle. A conservation easement or deed restrictions to protect the compensation area must be arranged. Compensation areas may be transferred to a resource agency or appropriate private organization for long-term management. The Service must be provided with a map and written details identifying the compensation area; and the applicant must receive approval from the Service that the compensation area is acceptable prior to initiating the conservation program. A true, recorded copy of the deed transfer, conservation

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easement, or deed restrictions protecting the compensation area in perpetuity must be provided to the Service before project implementation.

Adequate funds must be provided to ensure that the compensation area is managed in perpetuity. The applicant must dedicate an endowment fund for this purpose, and designate the party or entity that will be responsible for long-term management of the compensation area. The Service must be provided with written documentation that funding and management of the compensation area (items 3-8 above) will be provided in perpetuity.

3. Weed Control. Weeds and other plants that are not native to the compensation area must be removed at least once a year, or at the discretion of the Service and the California Department of Fish and Game. Mechanical means should be used; herbicides are prohibited unless approved by the Service.
4. Pesticide and Toxicant Control. Measures must be taken to insure that no pesticides, herbicides, fertilizers, or other chemical agents enter the compensation area. No spraying of these agents must be done within one 100 feet of the area, or if they have the potential to drift, flow, or be washed into the area in the opinion of biologists or law enforcement personnel from the Service or the California Department of Fish and Game.
5. Litter Control. No dumping of trash or other material may occur within the compensation area. Any trash or other foreign material found deposited within the compensation area must be removed within 10 working days of discovery.
6. Fencing. Permanent fencing must be placed completely around the compensation area to prevent unauthorized entry by off-road vehicles, equestrians, and other parties that might damage or destroy the habitat of the beetle, unless approved by the Service. The applicant must receive written approval from the Service that the fencing is acceptable prior to initiation of the conservation program. The fence must be maintained in perpetuity, and must be repaired/replaced within 10 working days if it is found to be damaged. Some compensation areas may be made available to the public for appropriate recreational and educational opportunities with written approval from the Service. In these cases appropriate fencing and signs informing the public of the beetle's threatened status and its natural history and ecology should be used and maintained in perpetuity.
7. Signs. A minimum of two prominent signs must be placed and maintained in perpetuity at the compensation area, unless otherwise approved by the Service. The signs should note that the site is habitat of the federally threatened valley elderberry longhorn beetle and, if appropriate, include information on the beetle's natural history and ecology. The signs must be approved by the Service. The signs must be repaired or replaced within 10 working days if they are found to be damaged or destroyed.

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Monitoring

The population of valley elderberry longhorn beetles, the general condition of the compensation area, and the condition of the elderberry and associated native plantings in the compensation area must be monitored over a period of either ten (10) consecutive years or for seven (7) years over a 15-year period. The applicant may elect either 10 years of monitoring, with surveys and reports every year; or 15 years of monitoring, with surveys and reports on years 1, 2, 3, 5, 7, 10, and 15. The conservation plan provided by the applicant must state which monitoring schedule will be followed. No change in monitoring schedule will be accepted after the project is initiated. If mitigation is done in stages (i.e., not all mitigation is implemented in the same time period), each stage of mitigation will have a different start date for the required monitoring time.

Surveys. In any survey year, a minimum of two site visits between February 14 and June 30 of each year must be made by a qualified biologist. Surveys must include:

1. A population census of the adult beetles, including the number of beetles observed, their condition, behavior, and their precise locations. Visual counts must be used; mark-recapture or other methods involving handling or harassment must not be used.
2. A census of beetle exit holes in elderberry stems, noting their precise locations and estimated ages.
3. An evaluation of the elderberry plants and associated native plants on the site, and on the compensation area, if disjunct, including the number of plants, their size and condition.
4. An evaluation of the adequacy of the fencing, signs, and weed control efforts in the avoidance and compensation areas.
5. A general assessment of the habitat, including any real or potential threats to the beetle and its host plants, such as erosion, fire, excessive grazing, off-road vehicle use, vandalism, excessive weed growth, etc.

The materials and methods to be used in the monitoring studies must be reviewed and approved by the Service. All appropriate Federal permits must be obtained prior to initiating the field studies.

Reports. A written report, presenting and analyzing the data from the project monitoring, must be prepared by a qualified biologist in each of the years in which a monitoring survey is required. Copies of the report must be submitted by December 31 of the same year to the Service (Assistant Field Supervisor for Endangered Species, Sacramento Field Office), and the Department of Fish and Game (Supervisor, Environmental Services, Department of Fish and Game, 1416 Ninth Street, Sacramento, California 95814; and Staff Zoologist, California Natural Diversity Data Base, Department of Fish and Game, 1220 S Street, Sacramento, California 95814). The report must explicitly address the status and progress of the transplanted and planted elderberry and associated native plants and trees, as well as any failings of the conservation plan and the steps taken to correct them. Any observations of beetles

or fresh exit holes must be noted. Copies of original field notes, raw data, and photographs of the compensation area must be included with the report. A vicinity map of the site and maps showing where the individual adult beetles and exit holes were observed must be included. For the elderberry and associated native plants, the survival rate, condition, and size of the plants must be analyzed. Real and likely future threats must be addressed along with suggested remedies and preventative measures (e.g. limiting public access, more frequent removal of invasive non-native vegetation, etc.).

A copy of each monitoring report, along with the original field notes, photographs, correspondence, and all other pertinent material, should be deposited at the California Academy of Sciences (Librarian, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118) by December 31 of the year that monitoring is done and the report is prepared. The Service's Sacramento Field Office should be provided with a copy of the receipt from the Academy library acknowledging receipt of the material, or the library catalog number assigned to it.

Access. Biologists and law enforcement personnel from the California Department of Fish and Game and the Service must be given complete access to the project site to monitor transplanting activities. Personnel from both these agencies must be given complete access to the project and the compensation area to monitor the beetle and its habitat in perpetuity.

Success Criteria

A minimum survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants must be maintained throughout the monitoring period. Within one year of discovery that survival has dropped below 60 percent, the applicant must replace failed plantings to bring survival above this level. The Service will make any determination as to the applicant's replacement responsibilities arising from circumstances beyond its control, such as plants damaged or killed as a result of severe flooding or vandalism.

Service Contact

These guidelines were prepared by the Endangered Species Division of the Service's Sacramento Field Office. If you have questions regarding these guidelines or to request a copy of the most recent guidelines, telephone (916) 979-2120 (Sacramento Valley Branch), or (916) 979-2752 (Coast Bay Delta Branch), or (916) 979-2728 (San Joaquin Branch), or (916) 979-2749 (Forest Ecosystems Branch), or write to:

U.S. Fish and Wildlife Service
Ecological Services
3310 El Camino Avenue, Suite 130
Sacramento, California 95821-6340

Conservation Guidelines for the Valley Elderberry Longhorn Beetle

Table 1: Compensation ratios based on location (riparian vs. non-riparian), stem diameter of affected elderberry plants at ground level, and presence or absence of exit holes.

Location	Stems (maximum diameter at ground level)	Exit Holes Y/N (quantify)	Elderberry Seedling Ratio ¹	Associated Native Plant Ratio ²
non-riparian	stems $\geq 1"$ & $\leq 3"$	No:	1:1	1:1
		Yes:	2:1	2:1
non-riparian	stems $> 3"$ & $< 5"$	No:	2:1	1:1
		Yes:	4:1	2:1
non-riparian	stems $\geq 5"$	No:	3:1	1:1
		Yes:	6:1	2:1
riparian	stems $\geq 1"$ & $\leq 3"$	No:	2:1	1:1
		Yes:	4:1	2:1
riparian	stems $> 3"$ & $< 5"$	No:	3:1	1:1
		Yes:	6:1	2:1
riparian	stems $\geq 5"$	No:	4:1	1:1
		Yes:	8:1	2:1

¹ Ratios in the *Elderberry Seedling Ratio* column correspond to the number of cuttings or seedlings to be planted per elderberry stem (one inch or greater in diameter at ground level) affected by a project.

² Ratios in the *Associated Native Plant Ratio* column correspond to the number of associated native species to be planted per elderberry (seedling or cutting) planted.

Conservation Guidelines for the Valley Elderberry Longhorn Beetle

Literature Cited

- Barr, C. B. 1991. The distribution, habitat, and status of the valley elderberry longhorn beetle *Desmocerus californicus dimorphus*. U.S. Fish and Wildlife Service; Sacramento, California.
- Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Unpublished Report. State of California, The Resources Agency, Department of Fish and Game, Natural Heritage Division, Sacramento, California.
- USFWS. 1980. Listing the valley elderberry longhorn beetle as a threatened species with critical habitat. Federal Register 45:52803-52807.
- USFWS. 1984. Recovery plan for the valley elderberry longhorn beetle. U.S. Fish and Wildlife Service, Endangered Species Program; Portland, Oregon.