

(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, discing, 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 discing 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, discing, 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. Permitters**

###### **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.