CHAPTER 4

Environmental Consequences

4.1 Introduction

This chapter presents the impacts analysis for the Proposed Action and the alternatives. It also presents the significance criteria for the evaluated resource areas and provides mitigation measures, where applicable, for potential environmental impacts of the Proposed Action.

As discussed in detail in Chapter 2: Proposed Action and Alternatives, the Proposed Action comprises:

- Applications for Section 10(a)(1)(B) and Section 2081 permits for each of the permittees (see Section 2.1)
- Approval of the HCP and issuance of the permits by the USFWS and the CDFG upon making a determination that issuance criteria have been met by the permittees
- Implementation of the HCP
- Adoption of the IA(s) to secure participation and compliance of the HCP applicants requesting take permits

This introductory section includes the following subsections to provide context for the analysis contained in this chapter.

- Summary of the resource areas analyzed and brief descriptions of impacts (Section 4.1.1)
- Cumulative impacts assessment, including the criteria for and identification of cumulative actions or projects for assessment in this EIR/EIS (Section 4.1.2)
- Previous analysis of impacts of covered activities (to provide an overall context for impacts to the Natomas Basin and the study area) (Section 4.1.3), and
- Analysis of impacts of independent implementation of the Proposed Action by the applicants (i.e., permittees) to demonstrate effects of implementation by individual as well as the collective permittees (Section 4.1.4)

4.1.1 Resources Considered and Summary of Impacts

The environmental analysis in this EIR/EIS is focused on how the following key resources of concern would be affected by the implementation of the Proposed Action.

- **Geology and Soils.** Section 4.2 describes how implementing the Proposed Action and the alternatives would affect geology and soils. Potentially significant erosion impacts are identified as a result of land disturbance, and recommended mitigation measures would reduce impacts to a less than significant level. Other potential geology and soils impacts from implementing the land use and water agencies' conservation measures would be less-than-significant.

- **Water Resources.** Section 4.3 describes how implementing the Proposed Action and the alternatives would affect water supply, water quality, and flood control conditions in the study area. Potentially significant water quality impacts resulting from implementing the Proposed Action are identified. Impacts could be mitigated to a less-than-significant level with the recommended mitigation measures. Other potential water resources impacts from implementing the land use and water agencies' conservation measures would be less than significant.

- **Biological Resources.** Section 4.4 describes expected future habitat conditions and species status with implementation of the Proposed Action and the alternatives. The issuance of ITPs has the potential to result in significant impacts to biological resources because, by definition, the decision to issue ITPs indicates the potential for the take of a species covered by the permits. The approval and implementation of the HCP, however, would mitigate for the effects of the taking and reduce those effects to a level that is less than significant. In instances where the analysis of the Proposed Action indicates the need for additional mitigation, these measures are presented and discussed in Section 4.4.5.4. The conservation measures of the HCP are summarized in Chapter 2 as part of the Proposed Action and are presented in detail in the *Draft Natomas Basin Habitat Conservation Plan* (City of Sacramento, Sutter County, Natomas Basin Conservancy, Reclamation District No. 1000, and Natomas Central Mutual Water Company, July 2002).

- **Cultural Resources.** Section 4.5 describes how implementing the Proposed Action and the alternatives would affect archaeological and historical resources. Potentially significant impacts could include the disturbance of unknown, subsurface archaeological or historical resources. Impacts could be mitigated to a less-than-significant level with the mitigation measures recommended in Section 4.5. Other potential cultural resources impacts from implementing the Proposed Action would be less than significant.

- **Land Use.** Section 4.6 describes how implementing the Proposed Action and the alternatives would affect local land use conditions, including agricultural resources. The loss of important farmlands would be a significant and unavoidable consequence of implementing the HCP. Other potential land use impacts from implementing the Proposed Action would be less than significant.

- **Socioeconomics.** Section 4.7 discusses how implementing the Proposed Action and the alternatives would affect local and regional social and economic conditions (e.g., population, employment) and the potential for disproportionate effects on minority and low-income populations. No significant impacts would occur as a result of implementing the Proposed Action.

- **Traffic.** Section 4.8 describes how implementing the Proposed Action and the alternatives would affect traffic conditions. Potentially significant traffic safety impacts are identified. Impacts could be mitigated to a less-than-significant level with the mitigation measures recommended in Section 4.8. Other potential traffic impacts from implementing the land use and water agencies' conservation measures would be less than significant.

- **Noise.** Section 4.9 describes how implementing the Proposed Action and the alternatives would affect ambient noise levels. Potentially significant noise impacts are identified.

Impacts could be mitigated to a less-than-significant level with the mitigation measures recommended in Section 4.9. Other potential noise impacts from implementing the Proposed Action would be less than significant.

- **Air Quality.** Section 4.10 describes how implementing the Proposed Action and the alternatives would affect regional air quality. Potentially significant air quality impacts are identified. Impacts could be mitigated to a less-than-significant level with the recommended mitigation measures. Other potential air quality impacts from implementing the land use and water agencies' conservation measures would be less-than-significant.
- **Public Health and Safety.** Section 4.11 describes how implementing the Proposed Action and the alternatives would affect public health and safety. Specifically, the focus of the analysis is on how waterfowl would affect air traffic safety at Sacramento International Airport. No significant impacts would occur as a result of implementing the Proposed Action or the alternatives.

4.1.2 Approach to Cumulative Impacts Analysis

4.1.2.1 Requirements for Cumulative Impacts Assessment

The Council on Environmental Quality regulations implementing NEPA define a "cumulative impact" for purposes of NEPA as follows:

> Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR Section 1508.7).

Cumulative impacts are defined similarly in the CEQA Guidelines:

> "Cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.
>
> (a) The individual effects may be changes resulting from a single project or a number of separate projects.
>
> (b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. (*California Code of Regulations*, Section 15355)

For the purposes of this EIR/EIS, significant cumulative impacts would occur if impacts related to the implementation of the Proposed Action, added to the environmental impacts of other past, present, and reasonably foreseeable similar actions, result in an adverse significant effect. For an impact to be considered cumulative, these incremental impacts and

potential incremental impacts must be related to the types of impacts caused by the Proposed Action (i.e., the types of impacts caused by implementing conservation measures for the covered species). Potential cumulative impacts are assessed within the separate resource area sections in this chapter, and are presented at the end of the individual resource sections.

4.1.2.2 Actions Included in the Cumulative Impacts Analysis

In consideration of actions to include in the cumulative impacts assessment in this EIR/EIS, past, present, and reasonably foreseeable actions that have the potential, in combination with the effects of the Proposed Action, to result in cumulative impacts are those that:

- submitted an urban development permit or other permit application to a federal or non-federal agency with approval authority[1]
- are related to the types of impacts attributable to those that would result from implementing the Proposed Action

On the basis of these criteria, the actions identified for consideration in the cumulative impacts analysis are described below. Generally, the analysis of cumulative effects includes actions that could affect the management of covered species in the Natomas Basin or in other parts of their range. This broad scope helps provide an understanding of the relative importance of the Proposed Action to overall population conditions. These other management actions include federal and state wildlife refuges, as prescribed by other state and federal programs, and in other HCPs. The management activities included in the analysis of cumulative effects are as follows.

- **Management of state and federal lands.** The region contains several wildlife refuges and other state and federal lands that provide benefit to wildlife, including many of the covered species (Figure 4-1). Because management of these state and federal lands must consider the needs of threatened and endangered species, the management of these lands is considered in the assessment of cumulative impacts. Specific refuge lands with geographic proximity to the Natomas Basin are as follows, including a brief description of refuge management activities.
  - **Vic Fazio-Yolo Basin Wildlife Area (managed by the CDFG).** The Yolo Basin Wildlife Area (WA) comprises 3,660 acres of the Yolo Basin floodplain, primarily south of the Interstate 80 Yolo Causeway. Plans for the Yolo Basin WA include expansion of the refuge to include substantial additional lands to the north, including lands directly west of the Natomas Basin. The Yolo Basin (including both refuge lands and private acreage) contains substantial agricultural acreage and other habitat types, but the primary purpose of lands within the Yolo Basin is to convey winter flood flows diverted from the Sacramento River. Private landowners in the Yolo Bypass, including the Conaway Ranch property north of the refuge, manage lands in part for the enhancement of wildlife values (e.g., duck clubs). The USFWS and CDFG maintain conservation easements over much of these areas.

[1] As discussed in Section 3.6.2.2, the Metro Air Park industrial Business Park (MAP) project is a separate project (i.e., it is not part of the Proposed Action evaluated in this EIR/EIS). The acreage of the MAP project is included in the 17,500 acres in the Natomas Basin that is the study area of the proposed HCP evaluated in this EIR/EIS to address impacts to covered species in a way that adequately represents current development plans. Because the acreage of the MAP project is considered in the evaluation of impacts in this EIR/EIS, it is not also included as a cumulative project in this document.

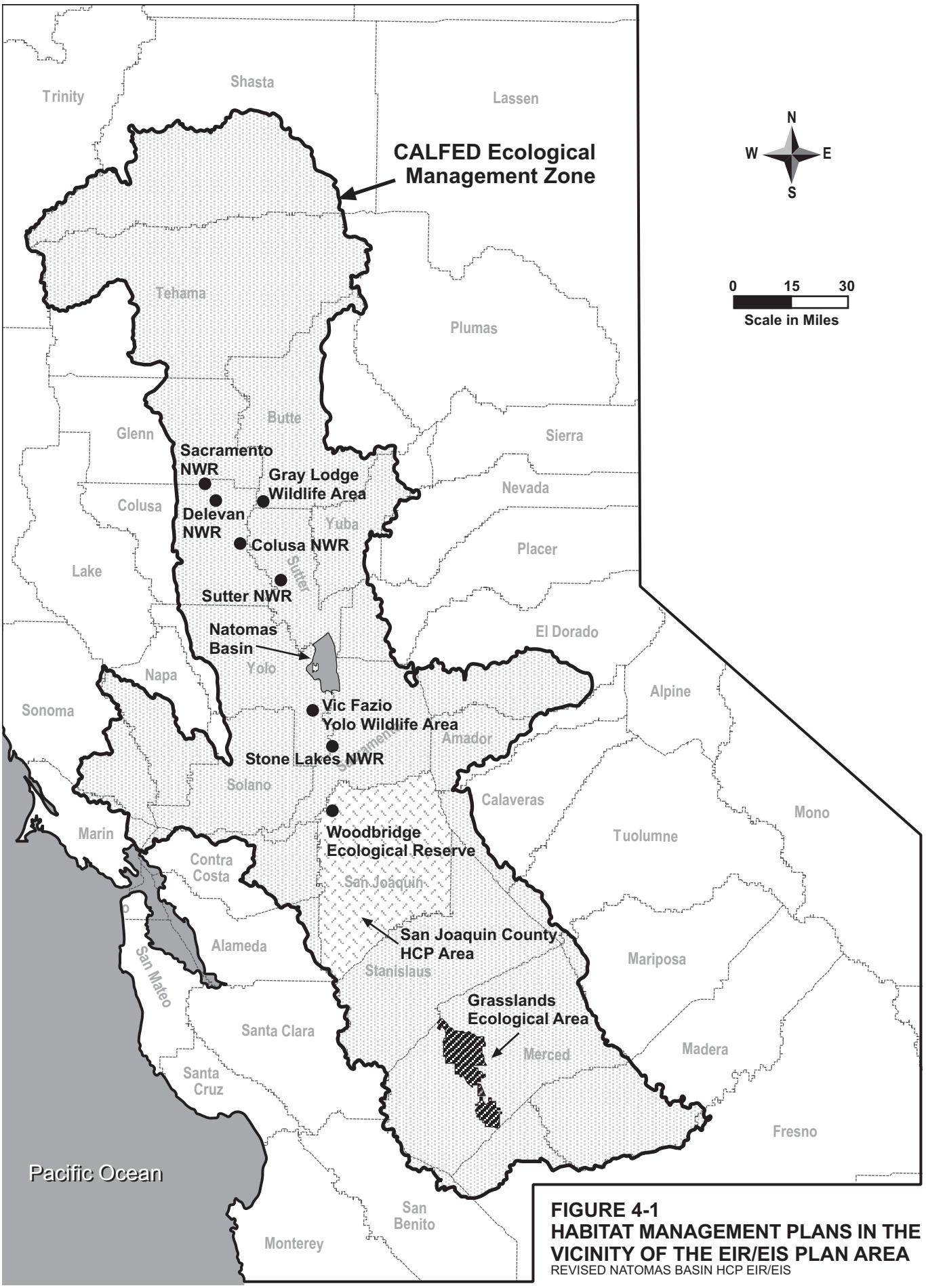

FIGURE 4-1
HABITAT MANAGEMENT PLANS IN THE VICINITY OF THE EIR/EIS PLAN AREA
REVISED NATOMAS BASIN HCP EIR/EIS

  - **Stone Lakes National Wildlife Refuge (managed by the USFWS).** The Stone Lakes National Wildlife Refuge (NWR) is located south of Sacramento near Freeport. Currently, Stone Lakes NWR comprises approximately 4,000 acres under management, with the eventual refuge boundary under active management being expanded to approximately 18,000 acres. Within the area managed by the USFWS (including the area known as Lower Beach Lake), about one-quarter is managed as restored wetlands and three-quarters as grazed, dry grassland. The refuge is managed with a biodiversity objective, and supports habitat restoration for threatened and endangered species (including an emphasis on the giant garter snake and Swainson's hawk) and Pacific Flyway waterfowl. Included within the Stone Lakes NWR boundary is Upper Beach Lake, which is currently managed by the Sacramento Regional County Sanitation District as part of the regional wastewater treatment plant.

  - **Sacramento National Wildlife Refuge Complex (managed by the USFWS).** The Sacramento National Wildlife Refuge Complex (Sacramento NWR Complex) includes the 2,591-acre Sutter National Wildlife Refuge (Sutter NWR), located primarily in the Sutter Bypass southwest of Yuba City. Similar to the Yolo Basin WA, the Sutter NWR is managed for waterfowl and other species that have the potential to inhabit winter-flooded areas. Portions of the Sutter NWR contain habitat suitable for giant garter snakes and other Proposed Action-covered species. Other refuge units of the Sacramento NWR Complex include the Sacramento, Delevan, and Colusa units, which are managed in a manner similar to the Sutter NWR, and the Sacramento River NWR, which is managed for riparian habitat values adjacent to the Sacramento River.

  - **Gray Lodge Wildlife Area (managed by the CDFG).** The Gray Lodge Wildlife Area (Gray Lodge WA) comprises 9,200 acres. It is managed primarily for waterfowl, but is also managed for the protection of threatened and endangered species, including the giant garter snake.

  - **Woodbridge Ecological Area (managed by the CDFG).** The Woodbridge Ecological Area, west of Lodi, comprises agricultural lands managed for the protection of wintering greater sandhill cranes.

  - **Grasslands Ecological Area (managed by the USFWS, CDFG, and private entities).** The Grasslands Ecological Area includes over 120,000 acres of state and federal wildlife areas and private lands that are managed primarily as duck clubs. The state and federal refuges include management measures for protecting threatened and endangered species, including those with the objective of bolstering the diminished populations of giant garter snakes in the San Joaquin Valley.

- **CALFED Bay-Delta Program.** The Multi-Species Conservation Strategy of the CALFED Bay-Delta Program includes conservation measures to achieve specific goals for 244 evaluated species. Generally, the Multi-Species Conservation Strategy is intended to enable CALFED-implementing entities to obtain the necessary authorizations for specific CALFED actions that could contribute to incidental take of federally or state-listed species. The specific goals for species include "recovery," "contribute to recovery," and "maintain." One species proposed for coverage under the Proposed Action—the

valley elderberry longhorn beetle—is included in the CALFED Multi-Species Conservation Strategy with a "recover" objective. Proposed-Action covered species with a "contribute to recovery" objective in the CALFED Multi-Species Conservation Strategy are the giant garter snake, Swainson's hawk, bank swallow, and Delta tule pea. All other species proposed for coverage in the ITPs, with the exception of the loggerhead shrike, are included in the Multi-Species Conservation Strategy with a goal of "maintain."

- **San Joaquin County Habitat Conservation Plan.** Similar to the proposed Natomas Basin HCP, the San Joaquin County HCP addresses the conservation of species in the context of land-use changes. This includes the acquisition of habitat reserves and the avoidance or minimization of impacts to covered species. The plan addresses 97 covered species, including the giant garter snake, Swainson's hawk, and all of the other species proposed for coverage under the Proposed Action.

4.1.2.3 Other Potential Actions in the Natomas Basin

The Proposed Action addresses the development of 17,500 acres in the Natomas Basin, consisting of 8,050 acres in the City of Sacramento (buildout of the North and South Natomas Community Plan areas), 7,467 in Sutter County (the South Sutter County Specific Plan area and other areas in the Industrial-Commercial Reserve), and 1,983 acres in the approved Metro Air Park special planning area. (As noted in Section 1.2.1, the Metro Air Park development has been previously approved and is included in the assessment in this EIR/EIS to provide a comprehensive and conservative assessment of impacts attributable to the covered activities of planned development). The acreage to be developed represents planned development for the Natomas Basin based on adopted plans. If granted, take authorization under the proposed ITPs (an ITP for Metro Air Park was issued on February 21, 2002) would apply to the authorized development of 15,517 acres in the City and Sutter permit areas and 1,983 acres of Metro Air Park development in the plan area. Local agency environmental impact analysis for this development has been completed (see Section 4.1.3).

Several other long-term projects have the potential to occur in the Natomas Basin at some unidentified future date. These projects, if they occur, would not be included in the 17,500 acres of planned development evaluated as part of the Proposed Action unless the HCP is amended and the ITPs are amended, or a new conservation strategy is developed for that additional development. Data sufficient to conduct a detailed assessment of cumulative impacts in this EIR/EIS are not currently available because the environmental review process for these actions has not been initiated, existing environmental review is limited and does not provide sufficient detail to assess impacts, or applications for the actions have not been filed. If and when these proposals become projects subject to environmental review, separate compliance under CEQA, NEPA, CESA, and ESA (including its take provisions) will be conducted, where applicable. Approval of any development beyond the 17,500 acres or outside the permit area would constitute a significant departure from the HCP and would trigger a reevaluation of the HCP, potential amendments and/or revisions to the HCP and ITPs, and possible suspension or revocation of the ITPs in the event the applicants violate such limitations without having completed the required reevaluation, amendments, or revisions. The projects are described below.

- **Development in Unincorporated Sacramento County.** Approximately 16,000 acres of land remain in unincorporated Sacramento County, excluding Sacramento International

Airport. This area is outside of the County's Urban Services Boundary, which means that development is not planned in the foreseeable future. Sacramento County is currently considering a long-term proposal, however, to amend its Urban Services Boundary to include an additional 6,519 acres of land in the Natomas Basin because of property owner interest in developing this area. The preferred alternative for this amendment is the area bounded by Sutter County to the north, the Sacramento City limit to the south, the Natomas Basin boundary (Steelhead Creek) to the east, and S.R. 99/70 to the west. At this time, the planning effort does not include a specific land use plan, but rather is intended to provide policy direction on urbanization for regional infrastructure purposes. A draft EIR for this proposal was released in November 2000, but the proposal is still under consideration. The City of Sacramento is also considering the possibility of future development in this area. The City's General Plan Amendment and Comprehensive Annexation Program describes the potential for annexation and development in portions of the currently unincorporated Natomas Basin, and presents the option of creating a one-mile permanent open-space buffer east of the Sacramento River and south of the Sutter County line.

In response to these long-term proposals, the City of Sacramento and Sacramento County have engaged in a long-range planning effort to guide the annexation of farmlands in the Natomas Basin which may be considered for future development. (These lands are outside of the City's permit area and are not included in the 17,500 acres of planned development analyzed in the HCP, this EIR/EIS, and in previous environmental documents—See Section 4.1.3). As part of this ongoing program, 10,000 acres of open space along the Sacramento River and in the vicinity of the Sacramento International Airport would be preserved, and the City would undertake planning efforts for the annexation of 10,000 acres directly north of Elkhorn Boulevard which may be developed with commercial and residential development.

Specific land use plans have not been prepared or proposed for future development of this 10,000 acre area, and no environmental review or permitting has been initiated. No specific land uses or projects have been proposed for development at this time.

Any future specific proposals related to annexation and development of additional lands beyond the 17,500 acres of planned development in the Natomas Basin would be subject to further planning efforts, technical analyses, CEQA review, and local approvals. Any lands proposed for development beyond those covered by the proposed HCP and for which incidental take is authorized would require a new effects analysis and/or reevaluation of the HCP, a new or amended conservation strategy, consultation with the USFWS and CDFG, and issuance of incidental take permits.

The HCP conservation measures evaluated in this EIR/EIS address the 17,500 acres of planned development.

Although future annexation proposals and related development of the identified area under consideration for annexation may contribute to cumulative impacts to the resources within the Natomas basin, no specific development projects have been proposed. Consequently, these effects are considered speculative at this time. Because the HCP's operating conservation program is based upon limiting total development within the City and Sutter's respective permit areas to 15,517 acres and limiting

development of Metro Air Park to 1,983 acres within the plan area, approval of additional development in Sacramento County would constitute a significant departure from the HCP's operating conservation plan and would trigger a new effects analysis, a new conservation strategy, and issuance of incidental take permits to Sacramento County for that additional development.

- **Sacramento International Airport.** Sacramento County currently owns approximately 5,575 acres of land for Sacramento International Airport. The Airport could undertake new construction activities on its lands (e.g., extending runways, expanding terminals), but specific development plans are still in the early stages of preparation. In addition, Sacramento County is considering expanding the airport outside of the current boundary to include a third runway, potentially requiring from 200 to 800 acres of additional lands. Currently, alternatives are being considered for the runway expansion, and could include additional lands to the west or north of the airport. The Master Plan Study is not expected to be completed until 2003, and physical expansion beyond the current airport boundaries is therefore speculative at this time.

- **Sacramento River East Levee Projects.** Several projects along the east levee of the Sacramento River related to water supply and flood control/drainage improvements are currently under consideration. These projects include:

  - **Natomas Mutual pumping plant consolidation.** Natomas Mutual operates three pumping plants along the Sacramento River, and is currently studying the potential for consolidating these pumping stations into one unit and installing state-of-the-art fish screens. This project would likely include additional canal improvements along the western boundary of the Natomas Basin. Detailed engineering plans and environmental review of this project have not been initiated at this time.

  - **Urban water intake.** Several municipal/industrial water users in the northern Sacramento region are studying the potential for a new urban water intake from the Sacramento River. This project would require a new pipeline from the river to convey water to urban areas east of the Natomas Basin. The feasibility of this project is currently being studied, but detailed engineering plans and environmental documents have not been prepared.

  - **Levee improvements.** The ACOE has received congressional authorization to raise the Sacramento River east levee and conduct additional improvements to the east levee and to the Cross Canal levees. Preliminary engineering plans are currently being revised, and environmental documentation is expected to be prepared late in 2002.

- **Highway Improvements.** Two projects are under consideration for traffic and circulation improvements in Sutter County, as follows.

  - **S.R. 99/70 – Riego Road Interchange.** Sutter County is preparing a Project Report for a partial cloverleaf interchange to replace the existing traffic signal at S.R. 99/70 and Riego Road. The partial cloverleaf design will require property acquisition outside of the current right-of-way. It is expected that the Project Report will be completed following the adoption of the South Sutter County Specific Plan.

  - **Placer Parkway.** The Placer County Transportation Planning Authority recently completed a Project Study Report for the proposed Placer Parkway, a new east-west expressway that would connect S.R. 65 north of Rocklin with S.R. 99/70 in South Sutter County. The preferred alignment identified in the Project Study Report places Placer Parkway entirely in the Industrial-Commercial Reserve, and would therefore be subject to the HCP without additional amendments. The final alignment, however, has not been selected, and may include lands that are not considered in Sutter County's 7,467-acre development area proposed to be covered under the ITPs.

- **Public Transit Corridor.** Regional Transit (RT) is currently studying alternatives for a new transit corridor from the Amtrak depot in downtown Sacramento to Sacramento International Airport. RT's alternatives analysis study for this Downtown-Natomas-Airport (DNA) corridor is expected to be completed in 2003. In the Natomas Basin, most of the DNA corridor would be located in the City of Sacramento or Metro Air Park, but a portion of the corridor between S.R. 99/70 and Metro Air Park is in unincorporated Sacramento County (Greenbriar Farms area). Development of the DNA corridor in this area would likely occur within the term of the HCP.

4.1.3 Previous Evaluation of Effects of Covered Activities

Direct, indirect, and cumulative impacts associated with construction of the authorized land development activities (i.e., the ITPs covered activities for the land use agencies) have been evaluated in the EIR for the City of Sacramento General Plan Update (City of Sacramento, 1987) and the EIR for the Sutter County General Plan (Sutter County, 1996c). Subsequent environmental review of direct, indirect, and cumulative impacts has occurred for the North and South Natomas Community Plans and for the Metro Air Park Area Plan, and for specific land development projects in the Natomas Basin including the Sysco distribution center in Sutter County and various neighborhoods in North and South Natomas. The planned development that would be covered by the issuance of ITPs to the City and Sutter County has been addressed in the land use agencies' respective General Plans and the associated environmental documents. Environmental review of land development also was recently completed for the South Sutter County Specific Plan. Additional environmental review is anticipated for specific future development projects in North Natomas, South Natomas, and in the South Sutter County Specific Plan area.

The analysis in this chapter of the EIR/EIS builds on and incorporates the prior extensive environmental analysis of urban development and infrastructure development included in the environmental documents prepared for the City of Sacramento General Plan EIR, the South Natomas Community Plan EIR, the North Natomas Community Plan EIR and Supplemental EIR, and the Sutter County General Plan EIR/EIS. The USFWS reviewed the impacts identified in these documents as part of its NEPA review and determined that these impacts would continue to result from underlying development authorized by the City and Sutter County, which would allow proceeding with the ITPs.

The following documents provide extensive background information, impact analyses, and adopted mitigation measures that help form the basis of environmental documentation and mitigation in the Natomas Basin. The documents below are incorporated by reference into this EIR/EIS and can be reviewed at the City of Sacramento Environmental Services office

located at 1231 I St., Suite 300, Sacramento, California, and at the USFWS offices at 2800 Cottage Way, Sacramento, California.

- *Draft EIR for the City of Sacramento General Plan Update* (SGPU DEIR), (City of Sacramento, 1987)
- *Draft Supplement to the 1996 North Natomas Community Plan EIR* (City of Sacramento, 1993)
- *Draft EIR for the South Natomas Community Plan* (City of Sacramento, 1988c)
- *Draft EIR for the Sutter County Comprehensive General Plan Revision* (Sutter County, 1996c)
- *Draft EIR for the North Natomas Comprehensive Drainage Plan* (City of Sacramento, 1996b)
- *City of Sacramento General Plan Update* (City of Sacramento, 1988a)
- *Sutter County General Plan 2015* (Sutter County, 1996a)

Planned development within Sutter County is based on development levels described in the *Sutter County General Plan 2015* (Sutter County, 1996a). Similar to the City's General Plan, the *Sutter County General Plan 2015* outlines the goals, policies, and land use patterns for future development in Sutter County. The EIR for the General Plan (Sutter County, 1996c) describes the overall environmental effects of this development, and includes additional mitigation requirements where appropriate.

For the lands to be developed within the Industrial-Commercial Reserve in Sutter County, 85 percent of the land use would be for industrial uses and 15 percent would be for commercial uses (Sutter County, 1996a). Other than specifying the total amount of development allowed and the ratio of allowable uses within the Industrial-Commercial Reserve, the Sutter County General Plan does not specify or plan the actual pattern of development. According to the *Sutter County General Plan Update* (Sutter County, 1996b), the County finds that it is likely that development would not occur on an incremental basis and that an urban core would be surrounded by an agricultural border. Each development project would be considered by the County on the basis of its merits and general plan consistency purposes. Sutter County prepared a draft Specific Plan for the first 3,500 acres of development within the Industrial-Commercial Reserve. An EIR for that plan has been prepared.

The impacts and mitigation measures for the land use agencies' covered activities are described in these documents and summarized within the separate resource area sections in this chapter. In addition, the impacts, mitigation measures, and findings of these environmental documents are summarized in Appendix C. These prior analyses considered the effects of planned development, including cumulative effects, within each land use agency's permit area. The impacts identified in these previous environmental reviews, therefore, are assessments of the planned development that is a covered activity under the Proposed Action in this EIR/EIS. The assessments in the prior environmental documents, therefore, disclose the impacts and provide the mitigation measures for the planned development (see Appendix C).

The alternatives in the previous environmental documents also address revised development scenarios and the alternatives evaluated in this EIR/EIS focus on revised mitigation ratios. One of these alternatives (Alternative 4) could result in changes to the

planned development, but these changes would be reductions in development. As a result, the impacts attributable to Alternative 4 would be less than those identified in prior environmental review documents (see Appendix C). The alternatives in this EIR/EIS would not result in planned development in excess of 17,500 acres and, therefore, the impacts of implementing the alternatives would be less than significant.

In addition, impacts attributable to independent implementation by either the City or Sutter County of the planned development that is a covered activity in the HCP would be the same or less than those analyzed in the previous environmental documents. Under independent implementation, either the City or Sutter County would proceed with planned development (i.e., impacts of less than planned development would be less than the Proposed Action and, therefore, less than significant.

In instances where the impacts from land development have not been addressed in previous documents, the need for additional mitigation is considered in this EIR/EIS. (Also see Sections 2.1 and 2.3 for a discussion of the permittees and their covered activities).

Additional supporting documentation of existing procedures, regulations, and standards are relied upon in the analysis in this EIR/EIS. These additional supporting materials are incorporated by reference:

- City of Sacramento Comprehensive Zoning Comprehensive Zoning Ordinance.
- City of Sacramento, City Code, Chapter 45, Trees.
- City of Sacramento. 1995. *Manual of Standards for the Design of New Development Onsite Stormwater Quality Control Measures, Vol. 5 City/County Drainage Manual*. Final Draft. January 23.
- City of Sacramento Ground Water Discharge Ordinance (Resolution No. 92-439).
- City of Sacramento. City Code, Chapter 9.26 1001 et. Seq. Regarding Floodplain Management Uniform Building Code Section 70.
- California Division of Mines and Geology. *Geologic Map of Sacramento Quadrangle*. 1987.
- Sacramento Metropolitan Air Quality Management District, 1991. *Sacramento 1991 Air Quality Attainment Plan*. Sacramento, CA.
- Sacramento Metropolitan Air Quality Management District. 1994a. *Air Quality Thresholds of Significance*. Sacramento Metropolitan Air Quality Management District, Sacramento, California. December.
- The City of Sacramento Grading Ordinance No. 93-068.

4.1.4 Approach to Analysis of Independent Implementation by Individual Permittees

Both the Proposed Action and the alternatives, as defined in Chapter 2: Proposed Action and Alternatives, are based on the premise that the City, Sutter County, and the Natomas Basin Conservancy will concurrently seek ITPs for the covered activities implemented by each of the permittees within its sphere of authority and/or jurisdictions. RD 1000 and Natomas Mutual are currently considering participation as joint applicants. The Proposed Action

includes proposed conservation measures for the water agencies' covered activities, and these measures are included in the environmental review in this EIR/EIS (along with those of the City, Sutter County, and the Conservancy) to provide a comprehensive assessment of potential impacts as a result of implementing the Proposed Action. The water agencies do not, however, anticipate filing applications for permits at this time (see Section 1.2.1 for a discussion of the history and status of the water agencies' participation in the HCP development and in this EIR/EIS). In addition to the evaluation of impacts if all applicants submit permit applications, this EIR/EIS also includes an analysis on the impacts of HCP implementation by individual permit applicants. The intent is to identify any additional impacts not previously analyzed and mitigated in prior environmental documentation for the covered activities.

For each of the resource areas in this chapter, an analysis is included of the impacts anticipated to occur with independent implementation of the HCP. The potential impacts of implementation by individual permittees are assessed within the separate resource area sections in this chapter, and are presented at the end of the individual resource sections. (Also see Section 2.1 and 2.3 for a discussion of the permittees and their covered activities.)

Overall, the HCP contains mechanisms to assess incrementally the effects of implementing the HCP conservation measures, including the scenario of independent implementation by the individual permittees. The two mechanisms include: (1) an overall program review that would be conducted when urban development of 9,000 acres has been reached and (2) an independent mid point review that applies only to the land use agencies. The intent of these reviews is to recognize that uncertainties exist in the HCP plan implementation, including levels of development, program adaptations related to the future giant garter snake recovery plan, possible development of a Swainson's hawk recovery plan, and the ultimate location of the habitat reserves. Although the adaptive management program of the HCP is designed to address many of these uncertainties, the overall and midpoint review programs are intended to supplement these other HCP provisions. These review mechanisms are described briefly below and in detail in Sections VI.I and VI.J of the HCP.

- **Overall program review**: This would occur after 9,000 acres of urban development have been completed. During that review, an additional 3,000 acres (but not more than 12,000 acres) could be developed. Issues that would be evaluated include: (1) the status and population trends of the giant garter snake, Swainson's hawk and all other covered species; (2) status and effectiveness of the habitat reserve system, including its buffer and setback requirements; (3) the success of the HCP in meeting the 2,500- and 400-acre-minimum habitat block size requirements (4) the status and effectiveness of the HCP funding mechanisms; (5) the relative status and distribution of developed lands and reserve lands within each of the land use agencies' jurisdictions; (6) the success of the 25 percent managed marsh/50 percent rice ratio for supporting giant garter snakes; (7) compliance by the water agencies with approved canal and ditch maintenance practices.

- **Independent midpoint review for land use agencies**: In addition to the overall review, both the City and Sutter County would conduct independent midpoint reviews to provide additional assurances that the HCP's objectives are being achieved, in the event that development occurs more rapidly than projected or if one of the land use agencies discontinues participation in the HCP.

Overall, these two review mechanisms address the contingency of independent implementation of the HCP by individual permittees. The remainder of the analysis of impacts under independent implementation provides specific detail on the impacts to resources evaluated in this EIR/EIS if the permittees implement the HCP independently (and in the absence of the midpoint reviews).

4.2 Geology and Soils

This section describes geological hazards and impacts to soil resources resulting from implementation of the Proposed Action or the alternatives. For geology and soils, the Proposed Action would have a significant impact if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse
- Result in substantial soil erosion or the loss of topsoil

The analysis in this section concludes that no hazard-related impacts could occur, and that erosion resulting from the activities of heavy construction equipment during the Conservancy's habitat-development activities would be minor. Additional discussion of the secondary water quality and air quality effects associated with erosion are described in Section 4.3 (Water Resources) and Section 4.10 (Air Quality).

As discussed in Section 4.1.3, the covered activities associated with the Proposed Action have been analyzed in previous environmental documents, and the collective findings of the previous analysis for geology and soils are presented in Appendix C and briefly summarized here to provide context for the action being evaluated in this EIR/EIS (See Chapter 2: Proposed Action and Alternatives). (Also see Section 4.1.3 for a list of environmental review documents applicable to the permittees' covered activities and the location at which they are available for review). As a result of these analyses, both the City Council of the City of Sacramento and the Sutter County Board of Supervisors determined that the geology and soils impacts associated with urban development would be less than significant with the implementation of mitigation requirements. Such requirements include geotechnical studies to ensure safe buildings and best management practices to minimize and control erosion.

4.2.1 Proposed Action

4.2.1.1 Impacts With Participation by All Permittees

Implementation of the Proposed Action would result in the creation of 8,750 acres of habitat reserves, based on 17,500 acres of development and a 0.5:1 mitigation ratio. Habitat reserves would be established subject to the provisions of the HCP, including the requirements for one 2,500-acre contiguous reserve, 400-acre minimum reserve sizes, and not more than 20 percent of reserves allowed outside of the Natomas Basin. Potential impacts to geology and soils would primarily occur during the Conservancy's habitat development activities.

Earthmoving activities would be limited to parcels acquired for habitat reserves requiring restoration or conversion to managed marsh and, potentially, upland habitat. For example, the current management plan for restoring habitat on the Betts-Kismat-Silva property (338 acres) includes the following activities (Natomas Basin Conservancy, 2001):

- Excavation and grading (totaling over 190,000 cubic yards due to the majority of the site being restored to managed marsh and grassland) using scrapers, dozers, graders, and other heavy construction equipment
- Site-specific placement of fill material in berms and levees
- Construction of ditches, swales, and underground pipelines to carry irrigation water
- Installation of water control structures at precise elevations
- Fine grading and soil preparation

Impacts associated with these and similar activities are expected to occur wherever habitat development would occur in the study area. Such activities are likely to occur on lands converted to managed marsh and on the portion of the upland reserves converted to native habitat. With completion of the planned development covered activities, several thousand acres of reserve lands could be affected. Potential soil hazards associated with grading and backfilling (such as increasing the potential for unstable soil conditions, liquefaction, lateral spreading, or subsidence) would not result in significant impacts because, in general, the composition of the soils would not be changed as a result of creating the habitat reserves. Developed uses associated with the creation of reserves would be minor or negligible (e.g., water control structures), and implementing the Proposed Action would not increase the likelihood of people being exposed to geological hazards. Permanent inhabited structures are not proposed for the habitat reserves and, therefore, no people or structures would be subject to geologic or soil-related hazards that could occur in the area.

Temporary, localized erosion could occur on the reserves during the creation of habitat reserves as a result of bare soils being exposed to rain and wind. This is a potentially significant impact. Mitigation is recommended for the secondary water quality and air quality effects of this temporary erosion, as described in Sections 4.3 (Water Resources) and 4.10 (Air Quality). Because of the extent of revegetation anticipated under the site-specific management plans for the reserves (see Section IV.D. of the HCP), no long-term erosion impacts would occur.

Potential ongoing erosion impacts associated with activities conducted by both the Conservancy on the habitat reserves and by RD 1000 and Natomas Mutual as part of their ongoing management generally would result from farming and vehicle use on access roads. Erosion impacts would be similar to current conditions and, therefore, no impacts would occur.

4.2.1.2 Mitigation

Mitigation for temporary erosion impacts is described in Section 4.3 (Water Resources) and Section 4.10 (Air Quality). No other mitigation is required for geology and soil impacts because impacts would be less than significant.

4.2.1.3 Level of Significance After Mitigation

Temporary erosion impacts would be reduced to a less-than-significant level with implementation of mitigation measures described in Section 4.3 (Water Resources) and 4.10 (Air Quality). Other impacts would be less than significant without mitigation.

4.2.2 Alternative 1. Increased Mitigation

4.2.2.1 Impacts With Participation by All Permittees

Implementation of Alternative 1 would require mitigation of 17,500 acres of land, pursuant to a 1:1 mitigation ratio for new development. The types of potential geology and soil impacts that could occur as a result of implementing Alternative 1 would be similar to the those occurring under the Proposed Action, as described in Section 4.2.1.1 above. Because structural improvements and human habitation are not planned, no impacts associated with geological and soil-related hazards, including hazards to humans, would occur. Temporary, localized erosion could occur on the reserves during habitat development as a result of bare soils being exposed to rain and wind. This is a potentially significant impact, and mitigation is recommended for the secondary water- and air-quality effects associated with this temporary erosion, as described in Sections 4.3 (Water Resources) and 4.10 (Air Quality). Because of the extent of revegetation anticipated under the site-specific management plans (see Section IV.D. of the HCP), no long-term erosion impacts would occur.

Potential ongoing erosion impacts associated with activities, both as conducted by the Conservancy on the habitat reserves and as conducted by RD 1000 and Natomas Mutual, generally would result from farming and vehicle use on access roads. Erosion impacts would be similar to current conditions, and therefore no impacts would occur.

4.2.2.2 Mitigation

Mitigation for temporary erosion impacts is described in Section 4.3 (Water Resources) and Section 4.10 (Air Quality). No other mitigation is required for geology and soil impacts because impacts would be less than significant.

4.2.2.3 Level of Significance After Mitigation

Temporary erosion impacts would be reduced to a less-than-significant level with implementation of mitigation measures described in Section 4.3 (Water Resources) and 4.10 (Air Quality). Other impacts would be less than significant without mitigation.

4.2.3 Alternative 2. Habitat-based Mitigation

Implementation of Alternative 2 would require the acquisition of 17,763 acres of land for mitigation pursuant to the habitat-based mitigation ratios described in Section 2.6.2. Because the mitigation acreage under Alternative 2 would be approximately the same as under Alternative 1, potential impacts to geology and soils as a result of developing habitat reserves would be approximately the same as described above for Alternative 1. As described for the Proposed Action, no impacts would occur as a result of RD 1000's or Natomas Mutual's activities, or as a result of ongoing Conservancy management of the habitat reserves.

4.2.4 Alternative 3. Reserve Zones

Alternative 3 focuses on the acquisition of habitat reserves in specific zones within the Natomas Basin, based on giant garter snake and Swainson's hawk habitat availability. The acreage to be acquired and all other implementation requirements would be the same as the Proposed Action. The potential impact to geology and soils as a result of developing habitat reserves, therefore, would be the same as under the Proposed Action. As described for the Proposed Action, no impacts would occur as a result of RD 1000 or Natomas Mutual activities, or as a result of ongoing Conservancy management of the habitat reserves.

4.2.5 Alternative 4. Reduced Potential for Incidental Take

Development of 12,000 acres under Alternative 4 would result in the acquisition of 6,000 acres of habitat reserves, using a 0.5:1 mitigation ratio. Compared with the Proposed Action, implementing Alternative 4 would result in less land being conserved as habitat reserves (6,000 acres under Alternative 4 versus 8,750 acres under the Proposed Action). The soils and geology impacts under this alternative would be similar to the Proposed Action but the temporary and localized impacts would affect a smaller area. The same mitigation measures recommended for the Proposed Action would be applied to this alternative and, as a result, impacts would remain less than significant after mitigation. As described for the Proposed Action, no impacts would occur as a result of RD 1000's or Natomas Mutual's covered activities, or as a result of ongoing Conservancy management of the habitat reserves.

4.2.6 Alternative 5. No Action Alternative

Establishment of the habitat reserve system as described under the Proposed Action and the other alternatives would not occur under the No Action Alternative. No other conservation measures as outlined in the HCP would be implemented. However, as discussed in Section 2.6.5, planned land development and the associated mitigation for biological resources impacts would still occur, and it is expected that such mitigation would require active habitat restoration efforts resulting in similar effects as described above for the Proposed Action and the other alternatives. These activities would be similar to current land management practices in the Natomas Basin and similar habitat areas, and are not expected to result in substantially different impacts relative to current conditions.

Under the No Action Alternative, RD 1000 and Natomas Mutual would continue their activities consistent with current practices, with no substantial change relative to the Proposed Action or the other alternatives. Management of existing habitat reserves by the Conservancy would still be required, resulting in similar impacts as under the Proposed Action and other alternatives.

4.2.7 Effects Under Independent Implementation

As discussed above, the only component of the Proposed Action with the potential to result in impacts to soils and geology is temporary, localized erosion during the creation of habitat reserves as a result of bare soils being exposed to rain and wind. Mitigation measures that include adherence to State Water Resources Control Board requirements and to dust abatement best management practices are included. They would mitigate these impacts to a less-than-significant level and are discussed in Sections 4.3 (Water Resources) and 4.10 (Air Quality). Regardless of whether one or more permittees participated in implementing the

Proposed Action, these measures would still be applied and, therefore, impacts under independent implementation would not differ from impacts with participation by all permittees.

4.2.8 Cumulative Impacts

Cumulative impacts would include the additional effects associated with the implementation of other regional conservation activities (see Section 4.1.2). Potential effects on geology and soil resources associated with management activities in these areas would be similar to the effects described above in Section 4.2.1.1 (e.g., localized erosion). Temporary, localized erosion would occur as a result of bare soils being exposed to rain and wind. Impacts associated with other habitat conservation activities could affect erosion in the study area, but would not further impact erosion in the study area because these activities would not occur in the Natomas Basin or Area B. Therefore, cumulative impacts would not occur.

4.3 Water Resources

This section describes potential impacts to water resources resulting from implementation of the Proposed Action or the alternatives, including flooding and drainage, water quality, and water supply. For purposes of this analysis, the Proposed Action would have a significant impact if it were to:

- Expose people or structures to a significant risk of loss, injury, or death involving flooding
- Substantially alter existing drainage patterns or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Violate water quality standards or waste discharge requirements
- Have insufficient water supplies available to serve the project from existing entitlements and resources
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge

The analysis in this section concludes that no flood risk, drainage, or water supply impacts would occur. Similar to other types of development projects, activities associated with creation of habitat reserves (e.g., conversion to managed marsh) could contribute to stormwater quality impacts.

As discussed in Section 4.1.3, the covered activities associated with the Proposed Action have been analyzed in previous environmental documents, and the collective findings of the previous analysis for water resources are presented in Appendix C and briefly summarized here to provide context for the action being evaluated in this EIR/EIS (See Chapter 2: Proposed Action and Alternatives). (Also see Section 4.1.3 for a list of environmental review documents applicable to the permittees' covered activities and the location at which they are available for review.)

The City Council of the City of Sacramento determined that environmental impacts associated with flooding and drainage, including the water quality effects of urban runoff, could probably be mitigated to a less-than-significant level through the implementation of the City's Comprehensive Drainage Plan. At the time substantial new development was being planned for the Natomas Basin (the 1994 adoption of the North Natomas Community Plan), the Comprehensive Drainage Plan was still under review. Because the plan was not finalized, the City did not determine that impacts would be mitigated to a less-than-significant level, and considered impacts to flooding, drainage, and water quality significant and unavoidable. The City determined that providing drinking water to the development areas in North and South Natomas would result in less-than-significant environmental effects because the City's existing surface water rights would ensure a supply of water that would exceed total demand (see Section 3.3).

In adopting the Sutter County General Plan, the Board of Supervisors determined that potentially significant flooding, drainage, water quality, and water supply impacts would occur, and determined that impacts could be mitigated to a less-than-significant level through the implementation of mitigation measures including future comprehensive planning (e.g., drainage) and site-specific evaluation during project review.

4.3.1 Proposed Action

4.3.1.1 Impacts With Participation by All Permittees

This section presents the potential flooding and drainage, water quality, and water supply impacts of the Proposed Action.

Flooding and Drainage

Implementation of the Proposed Action would result in the creation of 8,750 acres of habitat reserves, based on 17,500 acres of development and a 0.5:1 mitigation ratio. Habitat reserves would be established subject to the provisions of the HCP, including 50 percent of the reserve lands (4,750 acres) remaining in rice production, with the other 50 percent split between upland (including nonrice farming) and managed marsh habitats. As described in the HCP (Section IV.D) and in the Conservancy's site-specific management plan (Natomas Basin Conservancy, 2001), the establishment of habitat reserves does not involve new human habitation, structural improvements, or impermeable surfaces and, therefore, would not result in significant flood hazards or hydrologic changes attributable to these factors.

Conservation measures to be implemented during activities by RD 1000 and Natomas Mutual have been developed in consideration of RD 1000's flood control mandate. Conservation measures in the HCP would be implemented to the extent practicable, subject to override in emergency conditions as defined in Section V.B.3.c of the HCP.

Water management practices on the habitat reserves would be similar to current agricultural water management and, therefore, would not result in substantive changes to existing hydrologic patterns in the study area. Up to 4,750 acres would remain in rice production. As described in the Conservancy's management plan (Natomas Basin Conservancy, 2001), water management on Conservancy rice fields would be similar to existing rice production practices in the area (including winter flooding for straw decomposition). No impacts, therefore, are expected as a result of establishing habitat reserves for rice farming. In regard to managed marsh reserves, water management would vary slightly from typical

agricultural practices. For example, a seasonal marsh would be similar to a flooded rice field in winter, but could be maintained in summer with less water than is required for a rice field. In addition, hydrologic patterns would be slightly altered to create the necessary contours (and water surface elevations) for seasonal/perennial marsh and open water habitats. These alterations are expected to result in minor changes in local hydrologic patterns, but the limited extent and geographic scope of these changes would be minor relative to the overall Natomas Basin drainage system, and would be less than significant.

Water Quality

The Proposed Action could increase the potential for contaminant loading to the drainage system, and ultimately to the Sacramento and American Rivers. Such impacts could occur as a result of constructing and operating the habitat reserves. Development of 17,500 acres would result in the need to establish 8,750 acres of habitat reserves. In accordance with the management objectives described in the HCP (Section IV.C), a substantial portion of the reserve areas would not undergo physical changes; for example, existing rice fields would likely remain in production in support of the HCP's wetland habitat objectives. The wetland habitat objectives require that at least 25 percent of the reserves be managed marsh habitat, and heavy construction activities would be necessary to create this habitat. Although this construction would occur over time and in several different areas, potential water quality impacts could occur.

The two general categories of construction-related water quality impacts that typically occur during land development activities are: (1) increased water erosion and subsequent release of sediment into the drainage system, and (2) increased risk of pollutants from construction equipment (e.g., fuel, oil) being released into the drainage system. The federal Clean Water Act mandates that the potential for such water quality impacts be minimized, and statewide and local programs have been implemented pursuant to these requirements. At the state level, the State Water Resources Control Board has adopted a notification procedure for construction sites of more than 5 acres (to be reduced to 1 acre in late 2002), and a requirement for contractors to prepare and implement a Stormwater Pollution Prevention Plan. In the study area, these procedures are implemented by the Central Valley Regional Water Quality Control Board. At the local level, the City of Sacramento and Sacramento County have adopted erosion control programs, consistent with the statewide program, requiring that specific best management practices be implemented. These requirements are described in the City's *Administrative and Technical Procedures Manual for Grading and Erosion and Sediment Control* (City of Sacramento, 1994b) and the *County's Erosion and Sediment Control Standards and Specifications* (County of Sacramento, 1997). At this time, Sutter County does not have a similar program. These construction-phase stormwater pollution-prevention requirements provide the regulatory basis for determining thresholds of significance. Therefore, although Sutter County does not have a similar program, consistency with the City of Sacramento and Sacramento County programs is recommended as a requirement for developing the habitat reserves regardless of whether the reserves are to be located in Sacramento or Sutter County. Following these procedures is not a specific requirement of the HCP as proposed, and is not specifically required by the current management plan (Natomas Basin Conservancy, 2001). Accordingly, implementation of the Proposed Action could create or contribute runoff water that would provide additional sources of polluted runoff, which would be a significant impact.

Proposed activities on RD 1000 and Natomas Mutual's system of canals and drains in the Natomas Basin include those that have the potential to affect water quality. For example, water agencies conduct maintenance dredging of the canal and drain system, using mechanical vegetation-removal equipment that could result in increased turbidity in the waterways. The covered activities of the water agencies are not, however, anticipated to differ from existing operation and management practices and, therefore, impacts attributable to the Proposed Action would be the same as those under existing conditions. These impacts would be less than significant with implementation of the HCP's conservation measures because the water agencies' activities are conducted in accordance with existing regulations and guidelines. Management activities associated with rodent control are described below under the discussion of the Conservancy.

The potential for water quality impacts as a result of the Conservancy's ongoing operation of the habitat reserves is primarily related to the use of pesticides. Management of the habitat reserves would be similar to management of agricultural lands, especially for the reserve areas that remain in rice production. Rice farming typically involves the use of herbicides to control grasses and broad-leaved aquatic plants, and insecticides to control pest species such as rice water weevils and tadpole shrimp. Over the past 20 years, the primary regulatory focus has been directed toward the reform of rice herbicide use, primarily the herbicides molinate (Ordram®) and thiobencarb (Bolero®). Improved management practices (e.g., holding water on rice fields for a specified time following herbicide application) implemented by rice growers in the early 1980s, however, has substantively improved water quality conditions in downstream receiving waters. Maintaining consistency with these management practices is described in the Conservancy's site-specific management plan (Natomas Basin Conservancy, 2001). Because management of Conservancy rice lands would not change relative to current management conditions, the impact from implementing the Proposed Action would be less than significant.

Herbicide use on managed marsh and upland areas would be limited to exotic weed control, as described in the HCP. Other pesticide use is expected to be similarly limited (e.g., controlling rodents in a manner that is not detrimental to giant garter snakes). Therefore, no other water quality impacts are expected during ongoing management of the habitat reserves or for implementation of the water agencies' management actions.

Water Supply

As described in Section 3.3, non-urban water supplies in the Natomas Basin are typically obtained from either Natomas Mutual (which holds water rights in trust), other riparian or pre-1914 surface water rights, or groundwater. Some of this water is available as tailwater in RD 1000's system of drainage ditches. Existing surface water supplies in the Natomas Basin are highly reliable because of the seniority of Natomas Mutual's water rights and the shallow, accessible groundwater table. The addition of the habitat reserve system is not expected to change overall water demands in the Natomas Basin because the timing and volume of water use on the reserve system would be similar to existing agricultural water use (see the discussion of water management under Flooding and Drainage, above).

Because water is an integral part of reserve management, the HCP includes a specific water availability requirement in its reserve land acquisition criteria:

> Land has legal water rights to an adequate water supply to serve the anticipated uses (wetland or upland) of the proposed reserve. This would normally mean rights to water

> from the Natomas Mutual (or its equivalent supplier if outside the Basin), but may solely include groundwater if a groundwater well or wells exist on the property and that such wells can meet acceptable water quantity and quality needs. (Section IV.C.2.c.2)

This objective is also supported in Section IV.C.3.b.3 of the HCP:

> 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 giant garter snakes between sections of the reserve system.

The acquisition criteria (stated above) will help ensure that the Conservancy acquires lands with long-term water supply availability. Because of the reliability of existing water supplies and the acquisition criteria, the Conservancy is not expected to experience water supply deficiencies as it purchases lands and develops habitat reserves. It is anticipated that the reserves would use a level of irrigation comparable to what is used for existing rice crops and, therefore, the balance of water supply would not change substantially from existing uses. In the unlikely event that surface water supplies become unavailable, the Conservancy anticipates that groundwater supplies can be developed (Natomas Basin Conservancy, 2001). Such unforeseen projects are considered in the mitigation fee structure by the inclusion of a contingency fee. Overall, water supply impacts would be less than significant.

4.3.1.2 Mitigation

A potentially significant impact was identified in Section 4.3.1.1 above for water quality. The following mitigation measure is recommended to reduce potential construction-related stormwater pollution during the creation of habitat reserves.

> Construction of habitat reserves shall adhere to the requirements of the State Water Resources Control Board's General Permit for Stormwater Discharges Associated with Construction Activity, as amended from time to time, by filing an NOI with the Central Valley Regional Water Quality Control Board. For development activities on each reserve site, the Conservancy shall prepare a Stormwater Pollution Prevention Plan that includes best management practices consistent with the City's Administrative and Technical Procedures for Grading and Erosion and Sediment Control and Sacramento County's Erosion and Sediment Control Standards and Specifications, regardless of whether the reserves are located in Sacramento or Sutter County. Best management practices shall focus on the control of sediment discharge into local drains (e.g., through installation of barriers such as silt fences and through tracking controls) and the release of hazardous materials from construction operations (e.g., through the use of designated staging areas with onsite controls).

4.3.1.3 Level of Significance After Mitigation

Implementation of this mitigation measure would ensure consistency with statewide and local programs for water quality control during construction, and therefore reduce impacts to a less-than-significant level.

4.3.2 Alternative 1. Increased Mitigation

4.3.2.1 Impacts With Participation by All Permittees

Implementation of Alternative 1 would require mitigation of 17,500 acres of land, pursuant to a 1:1 mitigation ratio for new development. Changes in hydrology associated with reserve development and water management and subsequent effects on flood control, drainage, and water supply would be greater under Alternative 1 than under the Proposed Action because of the increased acreage requiring physical changes to improve habitat conditions. The types of changes, however, would be similar to the types of effects described for the Proposed Action (see Section 4.3.1.1 above). For the same reasons as described above for the Proposed Action, the extent of these changes and the similarity of habitat reserve management to existing agricultural practices is not expected to result in significant impacts to flood control and water supply in the Natomas Basin.

Development of habitat reserves would result in land disturbance, which has the potential to result in a significant impact to water quality because of the generation of sediment and the potential for the spill of construction fuels (see Section 4.3.1.1). The extent of land disturbance associated with reserve development activities would likely exceed 5 acres in size (the threshold for submitting an NOI under the statewide construction stormwater program). As described in Section 4.3.1.1, development activities occurring on the habitat reserves should follow local and statewide requirements for construction-phase stormwater pollution prevention.

Impacts associated with activities by RD 1000 and Natomas Mutual would be the same as described in Section 4.3.1.1. The potential for impacts or benefits would not change because the extent of the activities would not increase under Alternative 1 relative to current conditions.

The potential for water quality impacts during the Conservancy's ongoing operation of the habitat reserves under Alternative 1 is primarily related to the use of pesticides. As described in Section 4.3.1.1 above, management of the habitat reserves would be similar to management of agricultural lands. Because management of Conservancy rice lands would be similar to current management conditions, water quality impacts would be less than significant.

4.3.2.2 Mitigation

A potentially significant water quality impact was identified in Section 4.3.2.1, associated with reserve development activity. The geographical extent of reserve development would be greater under Alternative 1, but participation in the regional stormwater control program is expected to continue to provide adequate water-quality mitigation. Accordingly, implementing the mitigation measure described under the Proposed Action (Section 4.3.1.2) is also recommended for Alternative 1.

4.3.2.3 Level of Significance After Mitigation

Implementation of the stormwater control program would ensure consistency with statewide and local programs for water quality control during construction, and therefore reduce impacts to a less-than-significant level.

4.3.3 Alternative 2. Habitat-based Mitigation

Implementation of Alternative 2 would require the acquisition of 17,763 acres of land for mitigation pursuant to the habitat-based mitigation ratios described in Section 2.6.2. Because the mitigation acreage under Alternative 2 would be approximately the same as under Alternative 1, potential impacts to water resources as a result of habitat reserve development would be approximately the same as described above for the Proposed Action and Alternative 1. Accordingly, implementing the mitigation measure described under the Proposed Action (Section 4.3.1.2) is also recommended for Alternative 2. As described for the Proposed Action, impact from RD 1000's or Natomas Mutual's activities, or from ongoing Conservancy management of the habitat reserves would be less than significant.

4.3.4 Alternative 3. Reserve Zones

Alternative 3 focuses the acquisition of habitat reserves of specific zones within the Natomas Basin based on giant garter snake and Swainson's hawk habitat availability. The acreage to be acquired and all other implementation requirements would be the same as the Proposed Action. Therefore, the potential impact to water resources as a result of implementing this alternative would be the same as for the Proposed Action. Implementing the mitigation measure described under the Proposed Action (Section 4.3.1.2) is also recommended for Alternative 3. As described for the Proposed Action, no impacts would occur as a result of RD 1000's or Natomas Mutual's activities, or as a result of ongoing Conservancy management of the habitat reserves.

4.3.5 Alternative 4. Reduced Potential for Incidental Take

Development of 12,000 acres under Alternative 4 would result in the acquisition of 6,000 acres of habitat reserves, based on a 0.5:1 mitigation ratio. Compared with the Proposed Action , implementing Alternative 4 would result in less land being conserved as habitat reserves (6,000 acres under Alternative 4 versus 8,750 acres under the Proposed Action). Because less land would be converted to habitat reserves under Alternative 4, the potential for flooding and drainage, water quality, and water supply impacts relative to the Proposed Action would decrease. The potential for water quality impacts to occur during grading to create managed marsh and other habitat areas, although reduced under Alternative 4, would nevertheless require disturbance of over 5 acres of land, and therefore warrants the adoption of mitigation (see Section 4.3.1.2). As described for the Proposed Action, no impacts would occur as a result of RD 1000's or Natomas Mutual's activities, or as a result of ongoing Conservancy management of the habitat reserves.

4.3.6 Alternative 5. No Action Alternative

Implementation of the HCP and establishment of the habitat reserve system described under the Proposed Action and the other alternatives would not occur under the No Action Alternative, and no take permits would be issued to the applicants. As discussed in Section 2.6.5, planned land development and the associated mitigation for biological resources impacts would still occur. It is expected, however, that such mitigation would require active habitat restoration efforts, resulting in similar effects as described above for the Proposed Action and the other alternatives. These activities would be similar to current land management practices in the Natomas Basin and similar habitat areas, and are not expected to result in substantially different impacts relative to current conditions. Stormwater runoff

control requirements consistent with the statewide program would be required during these individual mitigation activities.

Under the No Action Alternative, RD 1000 and Natomas Mutual would continue their activities consistent with current practices, with no substantial change relative to the Proposed Action or the other alternatives. Management of habitat reserves by the Conservancy would still be required, resulting in similar impacts as under the Proposed Action and other alternatives.

The Proposed Action and alternatives are expected to have similar effects as the No Action Alternative, and impacts would therefore be less than significant relative to the No Action Alternative baseline.

4.3.7 Effects Under Independent Implementation

As discussed above (Section 4.3.1.1), conversion of agricultural lands to habitat reserves, especially to managed marsh, could result in impacts to water resources. If the Proposed Action were implemented independently (including the creation of habitat reserves and the implementation of conservation measures in the HCP), water resources impacts would remain the same as if all permittees participated in implementation. If either the City or Sutter County did not participate in implementing the Proposed Action, fewer acres would initially be affected because the acreage of reserve development would decrease commensurate with reduced land development. Although the water resources impacts under independent implementation would be comparable to the Proposed Action, they would initially apply to fewer areas. It is anticipated, however, that land development would still occur in either the City or Sutter County (even if one jurisdiction did not participate) because development would occur on a project-by-project basis (see Section 2.6.5).

The initial curtailment of development would not result in different impacts to flood control, drainage, or water supply concerns because of the limited effects of reserve development on these resources in the study area. The initial reduced extent of planned development would reduce potential water quality effects, but construction activities over 5 acres would still occur and, therefore, implementation of the mitigation measure described in Section 4.3.1.2 would still be required.

If only the City or Sutter County participated, the Conservancy would still manage the acquired reserves. The water resources impacts would not differ from the Proposed Action, and the proposed mitigation measures would still apply.

If only RD 1000 and Natomas Mutual participated, the effects would be comparable to those described above for just the participation of either the City or Sutter County (except that development would occur only on a project-by-project basis and, therefore, the water resources impacts would be the same but would be realized over a longer period of time). As discussed in Section IV.C.1.d of the HCP and shown in Figure 17 of the HCP, the water agencies would also maintain canals critical to the operations of their systems. As a result, if the water agencies did not participate, connectivity for giant garter snakes would be maintained because the water agencies' lack of participation would not result in system alterations that would adversely affect access of the giant garter snake to critical habitat.

All impacts would remain less than significant with mitigation, if independent implementation were to occur.

4.3.8 Cumulative Impacts

Cumulative impacts would include the additional effects associated with the implementation of other regional conservation activities (see Section 4.1.2). As described above, potential effects to drainage and flood control associated with the Proposed Actions are related to minor changes (i.e., less-than-significant) in water management. Impacts associated with projects evaluated for cumulative impacts could similarly affect flooding conditions in the study area, but would not adversely affect flood control conditions in the study area because these activities would not occur within the Natomas Basin or Area B and, therefore, no cumulative impacts would occur.

Potential water quality impacts of the development of habitat reserves (primarily managed marsh areas) include erosion (and subsequent sediment generation) and fuel spills associated with heavy construction activities. Pursuant to the mitigation requirements (Section 4.3.1.2), the Conservancy would follow local procedures for stormwater control and submit NOIs to the Central Valley Regional Water Quality Control Board for each development activity of more than 5 acres in size. Similar procedures and controls would be implemented during construction related to other habitat-conservation planning projects. Such measures would achieve consistency with the statewide program for mitigating stormwater impacts construction activity, which is designed to minimize the cumulative, nonpoint water pollution effects of development activities. Accordingly, cumulative effects would remain less than significant with implementation of these measures.

Water supply impacts would be less than significant because of the similarity of water use on the habitat reserves to existing water use in the study area. Water supply impacts associated with other habitat conservation activities could affect water supply conditions in each local project area, but would not affect water supply conditions in the study area because these activities would not occur in the Natomas Basin or Area B. Therefore, cumulative impacts would not occur.

4.4 Biological Resources

The purpose of this section is to identify and describe potential impacts to biological resources resulting from implementation of the Proposed Action and alternatives. This section is organized in the following subsections:

- Methodology (Section 4.4.1)
- Significance Thresholds (Section 4.4.2)
- Previous Evaluation of Effects of Covered Activities (Section 4.4.3)
- Changes to Habitat from Covered Activities (Section 4.4.4)
- Proposed Action (Section 4.4.5)
- Alternative 1 – Increased Mitigation (Section 4.4.6)
- Alternative 2 – Habitat-based Mitigation (Section 4.4.7)
- Alternative 3 – Reserve Zones (Section 4.4.8)
- Alternative 4 – Reduced Potential for Incidental Take (Section 4.4.9)
- Alternative 5 – No Action Alternative (Section 4.4.10)
- Effects Under Independent Implementation (Section 4.4.11)
- Cumulative Impacts (Section 4.4.12)

As noted in Section 4.1.1, the issuance of ITPs has the potential to result in significant impacts to biological resources because the decision to issue ITPs indicates the potential for the take of a species covered by the ITPs. Overall, the approval and implementation of the HCP would offset the impacts and mitigate the effects of take to a level that is less than significant. Additional mitigation measures (i.e., other than those in the HCP) are in Section 4.4.5.4 of this EIR/EIS.

4.4.1 Methodology

To assist in the analysis of expected habitat changes, standard categories of existing land uses and a GIS land-use database were developed to provide a framework for predicting future land area assigned to each of these categories (the methodology for developing the assessment database is also discussed in Section 3.4 because it was used as the basis for updating 1997 conditions to create an updated baseline). The year 1997 is the initial year in which land use characteristics in the permit areas are considered because the previous take permits were approved in 1997. Additional information available since 1997 and field data gathered in 2001 were used to supplement and update the 1997 data. The database includes land-use data from the Department of Water Resources (which are updated as described in Section 3.3 of this EIR/EIS), the City of Sacramento, Sutter County, RD 1000, Natomas Mutual, and the Conservancy.

An additional component of the GIS land-use database is the system of canals and drains owned and maintained by RD 1000 and Natomas Mutual. Existing digital information on the canals and drains was obtained from RD 1000 and Natomas Mutual and added to the database as linear features. Based on field data and information from Natomas Mutual, the canals and drains were divided into four categories: Class I (the Canal land-use category including the primary drainage system), Class II (large), Class III (medium), and Class IV (small).

Following the completion of the baseline scenario described above, the last step in the development of the database was to project a future-land-use scenario corresponding to build-out conditions in the Natomas Basin. This build-out condition includes the planned land-development activities of the City and Sutter County, and also includes the development of the Metro Air Park (MAP) project in unincorporated Sacramento County. (See Chapter 2: Proposed Action and Alternatives, for a description of the permittees' covered activities and for the rationale for including the acreage of the MAP project in the analysis of the Proposed Action in this EIR/EIS).

4.4.2 Significance Thresholds

For the purposes of this analysis, implementation of the Proposed Action and alternatives would have a significant effect on biological resources if they would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any special-status species
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, etc.) through direct removal, filling, hydrological interruption, or other means
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites
- Substantially reduce the habitat of a fish or wildlife species (such as causing a fish or wildlife population to drop below self-sustaining levels), threaten to eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal

4.4.3 Previous Evaluation of Effects of Covered Activities

As discussed in Section 4.1.3, the covered activities associated with the Proposed Action have been analyzed in previous environmental documents, and the collective findings of the previous analysis for biological resources are presented in Appendix C and briefly summarized here to provide context for the action being evaluated in this EIR/EIS (see Chapter 2: Proposed Action and Alternatives). (Also see Section 4.1.3 for a list of environmental review documents applicable to the permittees' covered activities and the location at which they are available for review.) The biological resources impacts identified in the previous review of planned development are as follows:

- The City determined that impacts to the following habitats and species would be a significant and unavoidable consequence of implementing the 1988 General Plan Update: riparian habitat, habitat along creeks and canals, fence-row habitat, vernal pools, special-status plant species, Swainson's hawk, white-tailed kite, giant garter snake, valley elderberry longhorn beetle, and water birds (associated with loss of agricultural habitat). The City adopted partial mitigation to address these impacts (e.g., preservation of habitat where feasible), but impacts could not be mitigated to a less-than-significant level.
- The City determined that impacts to the following habitats and species, as a consequence of implementing the 1988 General Plan Update, would be less than significant: heritage trees, annual grasslands, old fields, bald eagle, peregrine falcon, long-billed curlew, western yellow-billed cuckoo, least Bell's vireo, tricolored blackbird, California tiger salamander, thicktail chub, Sacramento anthicid beetle, golden eagle, ringtail, river otter, bank swallow, and burrowing owl.
- The City determined that the biological impacts associated with implementing the South Natomas Community Plan would be consistent with the impacts identified for implementation of the General Plan.
- The City determined that impacts to the following habitats and species would be a significant and unavoidable consequence of implementing the North Natomas Community Plan: seasonal wetland values provided by rice fields, giant garter snake, and other agricultural lands that provide Swainson's hawk foraging habitat.

- The City determined that impacts to wetlands and to Swainson's hawk and burrowing owl nesting areas, as a consequence of implementing the North Natomas Community Plan, would be less than significant with the adoption of appropriate mitigation measures (e.g., avoiding active nest areas). Impacts to other special-species plant and animal species evaluated in the EIR would be less than significant with a mitigation measure to conduct preconstruction surveys.
- Sutter County determined that, as a consequence of implementing the Sutter County General Plan, impacts to wetlands and canal habitat and to species associated with rice fields would be less than significant with the implementation of mitigation measures, including conducting preconstruction surveys, establishing temporary buffers around Swainson's hawk nest trees and wetlands, and establishing permanent buffers around canals.

Additional information for species not proposed for coverage in the ITPs is provided in the section below entitled "Other Special-Status Species."

4.4.4 Changes to Habitat from Covered Activities

To provide context for the analysis of impacts to biological resources, the following discussion summarizes the changes to land use that would occur in the Natomas Basin as a result of planned development. (Planned urban development is a covered activity of the ITPs and is discussed in Section 2.3 of this EIR/EIS.)

Urban development would occur in the Natomas Basin and, under the Proposed Action, fees would be collected in conjunction with this development and a system of permanent habitat preserves would be acquired. Urban development would occur on a total of 17,500 acres in the Natomas Basin distributed among the City of Sacramento, Sutter County, and Metro Air Park as shown in Table 4-1. This development would result in the conversion of 17,500 acres in the Natomas Basin to urban and associated uses. The Proposed Action specifies acquisition and preservation of 0.5 acre of habitat reserves for every 1 acre of land developed in the study area. Thus, approximately 8,750 acres of land would be acquired by the Conservancy (or conservation easement purchased) and managed and protected as habitat reserves.

TABLE 4-1
Acreage of Urban Development Covered by the Proposed Action

Jurisdiction	Acreage
City of Sacramento	8,050
Sutter County	7,467
Metro Air Park	1,983
Total	**17,500**

Source: Natomas Basin Habitat Conservation Plan, July 2002

The anticipated future land-use acreages in the Natomas Basin with 17,500 acres of urban development are shown in Table 4-2. This table shows the allocation of planned development for each land use agency permit area. Subsequent tables in Section 4.4 are derived from these data. Table 4-2 and Table 4-4 provide reference information only on the acreage changes that represent potential habitat for the covered species (see Section 2.1 and Table 2-1).

As shown in Table 4-2, urban development predominantly would occur in the southern portion of the basin in the City of Sacramento and in the northern portion of the basin in Sutter County's Industrial-Commercial Reserve. Most of the land converted to urban uses would be agricultural lands. Remaining portions of the basin outside of the development areas would be expected to remain predominantly in agriculture.

Canals and ditches also would be affected by urban development. Large canals (Class I) would persist in developed areas, but the smaller canals (Class II, III, and IV) would probably be removed (e.g., irrigation canals would be abandoned, drains would be replaced by pipelines) following urban development. Although Class I canals would remain, the habitat value of canals in areas subject to urban development likely would decline as urban development encroached on the canal. The changes with implementation of the covered activities are shown in Tables 4-3 and 4-4.

TABLE 4-2
Change in Land Use Acreage from Planned Development in the Natomas Basin

Habitat Class[a]	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Airport	1,551	(18)	0	(21)	(39)	1,513
Alfalfa	371	0	0	0	0	371
Canals	503	0	0	0	0	503
Grassland	886	(427)	0	(134)	(560)	325
Highways	1,435	0	0	0	0	1,435
Idle	1,464	(675)	(50)	(8)	(733)	731
Nonrice crops	16,686	(4,663)	(325)	(1,529)	(6,517)	10,169
Oak groves	98	(6)	(2)	0	(8)	89
Orchard	182	(13)	0	0	(13)	169
Other	468	(31)	0	0	(31)	437
Pasture	674	(23)	(22)	(101)	(147)	527
Ponds and seasonally wet areas	96	(7)	(4)	(10)	(21)	75
Rice	22,693	(970)	(1,541)	(5,577)	(8,087)	14,606
Riparian	124	(24)	0	0	(24)	100
Ruderal	1,970	(1,137)	(6)	(88)	(1,231)	739
Rural residential	377	(46)	(10)	0	(56)	321
Tree groves	106	(10)	(23)	0	(33)	73
Urban	3,854	8,050	1,983	7,467	17,500	21,354
TOTAL	**53,537**	**0**	**0**	**0**	**0**	**53,537**

(#) decrease in acreage
[a] Habitat Class is defined in Table 3-1.
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

TABLE 4-3
Change in Canal Length from Planned Development in the Natomas Basin (miles)

Canal Type	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Class I	35.9	0	0	0	0	35.9
Class II	50.5	(3.6)	(4.0)	(13.9)	(21.5)	29.0
Class III	97.6	(12.1)	(3.5)	(9.8)	(25.5)	72.1
Class IV	62.8	(3.6)	(4.1)	(9.9)	(17.5)	45.3
TOTAL	**246.8**	**(19.3)**	**(11.6)**	**(33.6)**	**(64.5)**	**182.3**

(#) decrease in length
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

TABLE 4-4
Change in Canal Acreage from Planned Development in the Natomas Basin [a]

Canal Type	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Class I	503	0	0	0	0	503
Class II	404	(29)	(32)	(111)	(172)	232
Class III	582	(72)	(21)	(59)	(152)	430
Class IV	289	(16)	(19)	(45)	(80)	209
TOTAL	**1,778**	**(117)**	**(72)**	**(215)**	**(404)**	**1,374**

(#) decrease in acreage
[a] Class II, III, and IV canals and drains are linear features in the Habitat and Land Use Assessment Database. Conversion to area features required using a standard width for each canal type, which was determined to be 65.9, 49.2, and 38.0 feet for Class II, III, and IV canals, respectively, based on information from Natomas Mutual. These standard widths include adjacent upland areas (e.g., maintenance roads) in addition to channel width.
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

4.4.5 Proposed Action

The Proposed Action would establish a multispecies conservation program to mitigate the expected loss of habitat values and incidental take of protected species that could result from the covered activities described in Section 2.3. The Proposed Action contains a variety of conservation strategies intended to maintain habitat values within the Natomas Basin, which are described in Sections IV (Conservation Plan) and V (Take Avoidance, Minimization, and Mitigation) of the HCP. The goal of the Proposed Action is to preserve, restore, and enhance habitat values found in Natomas Basin in the context of the permittees' covered activities. (See Section I.C [Biological Goals and Objectives] in the HCP for a detailed listing of goals and objectives.)

The primary component of the Proposed Action is the creation of habitat reserves. The reserves would consist of managed marsh habitats (25 percent), upland habitats (25 percent), rice fields (50 percent, which would typically be leased for use to rice farmers), and associated buffers and infrastructure. These percentages were assumed for the evaluation of changes

in wildlife habitat that would occur as a result of planned development. On the basis of monitoring program results as determined at the midpoint and overall program reviews or from any future USFWS Giant Garter Snake Recovery Plan or CDFG Swainson's Hawk Recovery Plan, the Conservancy would manage the reserves to promote habitat values for covered species. Native riparian trees would also be incorporated into the reserves. Section IV.C (Conservation Strategies to Mitigate for Urban Development) of the HCP provides additional information on the characteristics and management of the habitat reserves.

The HCP does not specify any particular land area for acquisition as habitat reserves because many factors affect the land areas ultimately purchased, including the quality and availability of parcels and the willingness of owners to sell. In addition to managing the reserves to benefit covered species, the HCP requires that the final reserve system consist of at least one 2,500-acre or larger contiguous block of reserve land. At completion, the remainder of the reserve system would consist of 400-acre or larger blocks of habitat. The reserves would establish a connected system of habitats that minimize fragmentation. Connections between reserves would generally take the form of common property boundaries between reserves, and waterways (primarily irrigation channels) passing between reserves. Connections would also include land corridors within reserves and adjacent agricultural fields to allow the migration of terrestrial species between reserves. Reserves would be acquired with a stipulation that an adequate water supply is available to serve the anticipated uses (e.g., managed marsh, upland).

Under certain circumstances, the Proposed Action allows acquisition of up to 20 percent of the habitat reserves (1,750 acres) in Area B (see Section IV.C [Conservation Strategies to Mitigate for Urban Development] of the HCP for additional information on the establishment of out-of-basin reserves). The general effect of establishing a portion of the habitat reserves in Area B would be a greater amount of agricultural land (up to 1,750 acres) remaining in the Natomas Basin in the future. Area B consists predominantly of rice fields and lands in other agricultural production (e.g., pasture). Assuming reserve lands in Area B would comprise 50 percent rice, 25 percent managed marsh and 25 percent upland habitat, 875 acres of rice in Area B would be incorporated into the reserves, 437.5 acres of existing agricultural land would be converted to managed marsh, and an additional 437.5 acres of existing agricultural land would be converted to upland habitat or managed to promote upland-habitat values.

Under the Proposed Action, the Conservancy would implement a monitoring and adaptive management program to document achievement of the biological goals of the HCP and determine if and when adjustments in management of the habitat reserves would be necessary to meet the HCP goals. Monitoring would determine the density and distribution of covered species on the habitat reserves, among other monitoring requirements (see Section VI.E [Biological Monitoring] in the HCP). Additional information on the monitoring and adaptive management program is available in Sections VI.E (Biological Monitoring), VI.F (Adaptive Management) and VI.H (Program Adaptation for Recovery Plans) in the HCP.

Urban development that occurs near wildlife habitat can increase predation on wildlife by increasing the number of feral and free-ranging domestic cats. Of the species covered by the HCP, predation by cats has been identified as a concern for giant garter snakes and could also be a concern for burrowing owls, tricolored blackbirds and northwestern pond turtles. The proposed 800-foot setback (see Section 2.4.5.3) would reduce the potential for special-status species inhabiting the reserves to be affected by predation by cats from urban areas. In addition, site-specific habitat development plans would be prepared for each

reserve area. These site-specific management plans and the monitoring and adaptive-management program of the HCP would provide a mechanism for addressing predation, as necessary, to ensure that the reserves are properly functioning for the covered species.

The analysis of impacts of the Proposed Action discusses impacts to: (1) habitat (Section 4.4.5.1), (2) species covered by the ITPs (Section 4.4.5.2), and (3) other special-status species (Section 4.4.5.3). Mitigation measures for the Proposed Action are presented in Section 4.4.5.4, followed by determination of significance after mitigation in Section 4.4.5.5.

4.4.5.1 Impacts to Habitat

Presented below are the impacts to habitat in the Natomas Basin that would result from urban development. The habitats discussed are: (1) marsh, (2) upland, (3) riparian, (4) oak groves, and (5) vernal pools.

4.4.5.1.1 Marsh Habitat

Existing wildlife habitat in the basin consists almost entirely of agricultural lands with little native habitat. Native marsh habitats (i.e., ponds and seasonally wet areas) are virtually absent from the Natomas Basin, occurring on only about 96 acres (about 0.2 percent) of the basin. Rice fields and irrigation canals and ditches currently perform some of the functions of marsh habitat.

Under the Proposed Action, the amount of rice fields in the basin would decline by about 8,087 acres (about 35 percent). Canals and ditches would be reduced by about 404 acres (about 23 percent). Of the 96 acres of ponds and seasonally wet areas in the Natomas Basin, the analysis conducted for this EIR/EIS indicates that 21 acres (about 22 percent) would be affected by urban development.

Ponds and seasonally wet areas occur throughout the Natomas Basin as isolated units; the loss of 21 acres could occur in approximately eight isolated areas subject to urban development in the City (7 acres), Metro Air Park (4 acres), and Sutter County (10 acres). Because some of the ponds and seasonally wet areas are likely to be jurisdictional wetlands, the projected loss of 21 acres of ponds and seasonally wet areas from urban development under the Proposed Action constitutes a substantial adverse effect on wetlands and is a potentially significant impact. Mitigation is proposed in Section 4.4.5.4.

The creation of the reserves could result in conversion of existing lands to other habitat types. It is not anticipated, however, that the acquisition of land for reserves and the creation of reserves would result in conversion of existing wetland/marsh areas to other habitat types. Therefore, impacts to existing wetland habitat as a result of implementing the HCP would be less than significant.

The conversion of rice fields and canals and ditches to urban uses would reduce the total acreage in the basin that functions as wetland (marsh) habitat. Rice fields and canals and drains provide important habitat for the federally listed giant garter snake. The 8,087-acre reduction in rice and 404-acre reduction in canals and drains projected under the Proposed Action would substantially reduce habitat for this species and, therefore, has the potential to result in potentially significant impacts.

The Proposed Action would, however, offset impacts to covered species potentially resulting from this decline in wetland acreage by creating 2,187.5 acres of high-quality

managed marsh habitat (including ponds and seasonally wet areas) to compensate for the conversion of 21 acres of existing ponds and seasonally wet areas that would occur as a result of planned development. The created habitat would be preserved in perpetuity. Rice fields and irrigation canals and ditches are intensively managed systems with little structural or biological diversity. As such, their value as wildlife habitat is lower than native marsh. Additional limitations on the habitat value of rice fields include:

- Agricultural practices and canal maintenance practices in support of agriculture can directly kill, injure, or disturb wildlife. Pesticide use can affect reproductive success of some species.
- Rice fields do not provide marsh habitat until late spring, when rice plants have grown enough and prey levels have developed sufficiently to attract wildlife.
- Rice fields that are not flooded in the winter provide no habitat for marsh-associated species during the winter.
- Rice fields are periodically rotated to other crops or fallowed, and therefore do not provide stable, reliable habitat over time.

The marsh habitat created on the habitat reserves would provide higher-quality habitat than the rice that would be converted to urban development. Features of the managed marsh contributing to the higher habitat quality include:

- A high amount of wetland/upland edge habitat to maximize structural complexity.
- Potholes (i.e., areas of deeper water) to provide habitat in late summer and fall after the rice fields have been drained.
- Year-round wetland habitat to maintain prey populations and avoid a delay in development of prey populations in the spring.
- Absence of mortality sources on managed marsh in the habitat reserves (versus sourses associated with rice production—e.g., canal maintenance activities, pesticide use).

Finally, the creation of marsh and upland habitat in the reserves would emphasize restoration to a natural marsh ecosystem. Thus, the habitat reserves would replace rice (which is an artificial, intensively managed monoculture) with a native ecosystem characterized by a complex structure and high habitat diversity.

With the restoration of the native ecosystem, the habitat reserves would provide the natural habitat conditions under which native wildlife species evolved. Preservation, creation, and management of managed-marsh habitat on the reserves would reduce the impact resulting from urban development to a less-than-significant level.

4.4.5.1.2 Upland Habitat

Native upland habitat in the Natomas Basin historically consisted of perennial grasslands. Native perennial grasslands currently are absent from the Natomas Basin, having been converted to urban uses, agricultural uses (e.g., rice, row crops, pasture, etc.), or annual grasslands dominated by non-native plant species. Crops such as wheat and alfalfa, ruderal areas, annual grasslands, and pasture substitute for the habitat functions of native grasslands.

Under the Proposed Action, the amount of upland habitat (as represented by alfalfa, grassland, nonrice crops, pasture, idle and ruderal) would decline by about 9,188 acres because of urban development. Upland habitat provides important foraging opportunities for the state-listed Swainson's hawk and other special-status species. Although the upland areas in the Natomas Basin do not represent a sensitive natural community, describing overall changes to upland land-use acreage does provide a common baseline for the discussion of impacts to special-status species. The 9,188-acre reduction in upland habitat projected to occur as a result of planned development (approximately a 42-percent reduction) would substantially reduce habitat for and adversely affect the Swainson's hawk and other special-status species. These effects constitute a potentially significant impact of the Proposed Action.

The Proposed Action would offset impacts to species covered by the ITPs potentially resulting from this decline in acreage by acquiring 2,187.5 acres of upland habitat and preserving this habitat in perpetuity. Upland habitat on the reserves would consist of alfalfa, pasture, grassland or other habitats conducive to Swainson's hawk foraging. Habitat would be managed primarily to provide optimal foraging conditions for Swainson's hawks.

Upland habitat in the reserves would provide better-quality habitat than that which would be converted by the covered activity of planned development. Most of the upland habitat that would be converted by development would be nonrice crops. Although some nonrice crops (e.g., wheat) can provide some of the habitat functions of grasslands, most nonrice crops are row crops, such as tomatoes, that provide little value to wildlife. As with rice, nonrice crops are intensively managed and provide little habitat diversity and limited prey abundance. Upland habitat on the reserves would be managed primarily to provide foraging habitat for Swainson's hawks, but the habitat requirements of other covered species (e.g., burrowing owls, loggerhead shrikes) would also be incorporated into the design and management of the habitat reserves. As a result, the upland habitat on the reserves would be expected to provide higher-quality habitat for wildlife than the nonrice crops converted under the Proposed Action. Preservation, creation, and management of upland habitat on the reserves would reduce the impact resulting from urban development to a less-than-significant level.

The creation of the reserves could result in conversion of existing crops (e.g., tomatoes) to native upland habitat, crops that have high value as upland habitat (e.g., alfalfa), or managed marsh. Because no native upland habitat currently occurs in the study area, no impacts to native upland would occur as a result of creating habitat reserves under the Proposed Action.

4.4.5.1.3 Riparian Habitat

In the Natomas Basin, riparian habitat is generally restricted to narrow, fragmented bands along canals and creeks. The basin supports about 124 acres of riparian habitat. Of these 124 acres, approximately 24 acres occur in the City of Sacramento. No riparian habitat occurs in Metro Air Park or in Sutter County's Industrial-Commercial Reserve. The remaining 100 acres of riparian habitat is in Sacramento County and in Sutter County outside of the Industrial-Commercial Reserve. The habitat and land use analysis conducted for this EIR/EIS shows a decrease in riparian habitat of approximately 24 acres. Most of this acreage (approximately 23 acres) is located along the city's side of Fisherman's Lake. This area is not designated as exempt from paying mitigation fees, and therefore is included in the habitat

and land use assessment as an area to be developed. This riparian habitat, however, would not be developed because of the required agricultural buffer to be created in this area under the Proposed Action (in accordance with the North Natomas Community Plan and the Settlement Agreement). A small, isolated area of riparian habitat comprising the remainder of the 24 acres of riparian habitat potentially affected (i.e., about 1 acre) is located near the northbound I-5 offramp to Del Paso Road. Some of this acreage could be affected by urban development, but a portion is located within a 100-foot wide freeway buffer, pursuant to the North Natomas Community Plan, that would be unaffected by development. Roadways and urban development, however, would surround this area. This small potential reduction in riparian habitat (i.e., less than 1 acre) attributable to planned development would not result in a substantial adverse effect on riparian habitat, and therefore the impact would be less than significant.

The creation of the reserves could result in conversion of existing crops (e.g., tomatoes) to native upland habitat or to crops that have high value as wildlife habitat (e.g., alfalfa). It is not anticipated, however, that the acquisition of land for reserves and the creation of reserves would result in conversion of riparian habitat to other habitat types. Therefore, impacts to riparian habitat as a result of implementing the HCP would be less than significant.

4.4.5.1.4 Oak Groves

A few small, isolated oak groves remain in the Natomas Basin, totaling about 98 acres. The analysis of future habitat changes predicts a loss of approximately 8 acres of oak groves associated with urban development under the Proposed Action. Loss of 8 acres of oak groves is attributable to three isolated groves in the Willow Creek area of the City of Sacramento and one 2-acre oak grove on the Metro Air Park property. Under the Proposed Action, however, valley oaks and other large trees are to be preserved wherever possible (See Section V.A Land Use Agencies' Conservation Measures in the HCP). Thus, some or all of these oak groves likely would be retained under the Proposed Action. The limited potential for a reduction in oak groves would not comprise a substantial adverse effect on this sensitive natural community or result in a substantial adverse effect to a special-status species, and therefore would not constitute a significant impact. The potential for impacts to mature oak trees would also be addressed during site-specific development review in accordance with the tree preservation requirements of the City and Sacramento County.

4.4.5.1.5 Vernal Pools

One small vernal pool complex is known to occur east of the I-5/S.R. 99 split in the City's permit area. Other vernal pools could occur in the grassland areas along the eastern perimeter of the Natomas Basin, including lands in both the City and Sutter County permit areas.

The vernal pools east of the I-5 split and other currently unknown vernal pool areas (expected primarily in the City's panhandle annexation area and the eastern portion of the Sutter County Industrial-Commercial Reserve) could be directly lost because of the covered activity of planned development or indirectly affected by urban development surrounding the pools. Urban development in areas surrounding vernal pools can change the hydrology of vernal pools and, therefore, change the suitability of the vernal pools for associated species. The potential for direct and indirect effects to vernal pools is a potentially significant impact of planned development because vernal pools: (1) are a sensitive natural community, (2) provide habitat for several special-status plant and animal species, and (3) in some cases can be protected waters under Section 404 of the Clean Water Act. In addition, amphibians

associated with vernal pools typically migrate between upland habitats and the breeding habitat of the vernal pool. Urban development around vernal pools can interfere with this movement and vehicular traffic can cause mortality for some amphibians (e.g., tiger salamanders) during their movements between upland and aquatic habitats. The potential for urban development to interfere with movement of animals between breeding locations in vernal pools or other seasonal wetlands and upland habitats constitutes a potentially significant indirect impact of implementing the HCP, which would prevent planned development from proceeding.

The Proposed Action includes procedures to avoid, minimize, and mitigate impacts to vernal pools and associated species potentially resulting from planned development (see Section V.A.4 Land Use Agencies' Conservation Measures in the HCP). Vernal pool resources within the City and the Sutter County permit areas would be identified prior to disturbance through preconstruction surveys and other biological investigations (e.g., those related to CEQA project review required for general plan, specific plan, rezone, subdivision, and other discretionary approvals). The following measures would be implemented by the City and Sutter County prior to issuance of a development permit when public or private development projects are proposed for areas that could support wetlands and/or vernal pool species.

- In the event a biological reconnaissance survey or the pre-construction survey identifies that vernal pool resources are onsite, a vernal pool species-specific biological assessment must be provided by the developer to the land use agency during the vernal "wet" pool season (as established by USFWS) to determine the type and abundance of species present. The species-specific biological assessment must be prepared by a qualified field biologist and shall list the methods of field analysis, condition of habitat, size and acreage of direct and indirect impact (as defined by seasonal inundation and hydric soils and other appropriate characteristics), and species present. This assessment must be submitted with the formal development application and prior to approval of an urban development permit by the land use agency.

- If it is determined that wetland and/or vernal pool resources would be disturbed by a project, then take of vernal pool associated covered species would be covered under the ITPs, subject to the following limitation and guidelines:

  – Where site investigations indicate vernal pool species may occur, the developer shall notify the land use agency regarding the potential for impacts to vernal pool species. Such notification shall include biological data adequate to allow the land use agency, and the USFWS and CDFG to determine the potential for impacts vernal pool species resulting from the proposed development.

  – Following notification by the land use agency, USWFS and CDFG shall identify specific measures required to avoid, minimize and mitigate impacts to vernal pool species to be implemented prior to disturbance and in accordance with adopted standards or established guidelines. If vernal pool species are found within proposed project areas, the project proponent shall coordinate with the USFWS and CDFG to ensure conservation measures are incorporated to avoid and protect sensitive plant species. In some cases, USFWS and CDFG may require complete avoidance of vernal pool species, such as the presence of covered species such as

slender orcutt grass, Sacramento orcutt grass, Colusa grass and/or vernal pool tadpole shrimp. Such measures shall be identified by USFWS and CDFG within 30 days or as soon as possible thereafter of notification and submittal of biological data to the agencies by the land use agency.

Developers would also potentially have the option of contributing to a mitigation bank as described in Section 2.4.6.1 of this EIR/EIS. With these Proposed Action measures, both direct (e.g., filling) and indirect (e.g., changes in hydrology) impacts to vernal pools and the associated species would be avoided or compensated in accordance with regulatory guidance from the USFWS. Because of the expected low numbers and size of vernal pools in the Natomas Basin, implementation of the standards outlined in the USFWS *Programmatic Consultation* is expected to reduce potential impacts to a less-than-significant level.

Vernal pools also could be affected during development of the habitat reserve system. Specific locations of all of the reserves have not been identified and, therefore, it is not possible to determine if vernal pools or vernal pool species would be affected by implementation of the Proposed Action. As part of the development of site-specific habitat creation and management plans under the Proposed Action, surveys to identify covered species currently or potentially supported by the specific parcel would be conducted. If vernal pools or vernal pool species are found, impacts to these resource would be avoided during habitat creation and management activities and appropriate management activities pursued, as necessary, to retain resources values.

4.4.5.2 Impacts to Species Covered by the ITPs

This section presents the impacts to the species covered by the ITPs. (See Table 2.1 for a list of the covered species, their habitats, and their statuses. Also see Section 3.4 for a discussion of existing conditions for these species. The acreages presented in the tables in this section are based on land use categories developed as part of the land use and habitat database. The categories represent potential habitat that might be used by the species. The acreages do not, however, represent habitat known to be occupied by the species.) The organization of the analysis of impacts to covered species is:

- Delta Tule Pea (Section 4.4.5.2.1)
- Sanford's Arrowhead (Section 4.4.5.2.2)
- Vernal Pool Species (Section 4.4.5.2.3)
- California Tiger Salamander (Section 4.4.5.2.4)
- Western Spadefoot Toad (Section 4.4.5.2.5)
- Valley Elderberry Longhorn Beetle (Section 4.4.5.2.6)
- Giant Garter Snake (Section 4.4.5.2.7)
- Northwestern Pond Turtle (Section 4.4.5.2.8)
- White-faced Ibis (Section 4.4.5.2.9)
- Tricolored Blackbird (Section 4.4.5.2.10)
- Swainson's Hawk (Section 4.4.5.2.11)
- Aleutian Canada Goose (Section 4.4.5.2.12)
- Burrowing Owl (Section 4.4.5.2.13)
- Bank Swallow (Section 4.4.5.2.14)
- Loggerhead Shrike (Section 4.4.5.2.15)

4.4.5.2.1 Delta Tule Pea

Effects of Changes in Habitat. Potential habitat for the Delta tule pea is found in marsh areas. In the Natomas Basin, ponds and seasonally wet areas are the primary potential habitat, although some ditches and canals could provide suitable conditions. Rice lands are not suitable for Delta tule pea because these lands are managed to discourage colonization by plants other than rice and are harvested annually. The habitat classes (from Tables 4-2 and 4-4) that provide potential habitat for the Delta tule pea and the changes in acreage from implementing the Proposed Action are presented in Table 4-5.

TABLE 4-5
Change in Potential Habitat for Delta Tule Pea (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Ponds and seasonally wet areas	96	(7)	(4)	(10)	(21)	75
Canals (all)	1,778	(117)	(72)	(215)	(404)	1,374
TOTAL	**1,874**	**(124)**	**(76)**	**(225)**	**(425)**	**1,449**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

Ponds and seasonally wet areas occur throughout the Natomas Basin as isolated units; the loss of 21 acres could occur in approximately eight isolated areas subject to urban development in the City near Arco Arena (7 acres), Metro Air Park near I-5 (4 acres), and in various scattered locations in Sutter County (10 acres) (see Figure 3-2). Assuming that smaller canals and drains do not remain after development has occurred, about 404 acres of Class II, III, and IV canals and ditches would be removed in the planned development areas. Some of these canals and ditches could provide suitable conditions for Delta tule pea. Because Delta tule pea is not known to occur in the Natomas Basin and the Natomas Basin is outside this species' known range, the loss of potential habitat associated with urban development is not likely to affect this species.

Under the Proposed Action, a stable and natural marsh environment would be created on 2,187.5 acres, thereby replacing the loss of 425 acres of potential habitat from urban development. This restored marsh area would substantially increase potential habitat for the Delta tule pea. The Proposed Action includes a measure for the Conservancy to consider introducing the Delta tule pea into suitable locations in the Natomas Basin. If pursued, these introductions would benefit the species by increasing the population size and distribution.

Effects of Construction Activities. The Natomas Basin is outside of the primary range of the Delta tule pea, and the species is not known to occur in the Natomas Basin, but direct mortality during construction is a potentially significant impact with regard to existing unknown populations. Significant impacts could also occur if areas are colonized by this species in the future. The potential for adverse effects to Delta tule pea would be avoided by the species-specific take-avoidance and minimization measures of the Proposed Action. Under the Proposed Action, surveys for covered species (including Delta tule pea) would be conducted prior to construction activities. If Delta tule pea were identified in construction areas, they

could be salvaged and transplanted in accordance with the requirements of the California Native Plant Protection Act, if deemed necessary and appropriate by the USFWS and CDFG.

Effects of Water Agency and Conservancy Management. Maintenance of the canal and drain system in the Natomas Basin could affect potential habitat for the Delta tule pea and directly remove individual plants. These potential effects are unlikely to occur, however, because the Natomas Basin is outside of the species' range, and the species is not currently known to occur in the basin. If the range of this species expanded and it colonized the canals and ditches in the Natomas Basin, activities conducted by Natomas Mutual and RD 1000 could affect individual plants.

The Proposed Action does not include specific requirements for water agency-covered activities to address potential impacts to Delta tule pea. The likelihood that this species would occur in the canals or ditches during the permit term, however, is low because of the routine sediment and vegetation control maintenance activities. Natomas Mutual and RD 1000 conduct regular operation and maintenance activities on the canals and ditches. These types of activities would continue under the Proposed Action. If Delta tule pea occurs, it would have colonized and persisted in the drains or canals coincident with these ongoing activities. Therefore, if Delta tule pea naturally colonizes the ditches and canals in the future, it would be expected to persist.

Delta tule pea could colonize portions of the habitat reserves in the future and/or the Conservancy could pursue introductions of this species under the Proposed Action. If this species becomes established in the habitat reserves, the Conservancy would implement measures to avoid and minimize take of plants. To determine if this plant colonizes the habitat reserves, the Conservancy would monitor for this species on the habitat reserves.

Overall Effects on Delta Tule Pea. Because this species is not known to occur in the Natomas Basin and its range does not include the Natomas Basin, the small loss of potential habitat attributable to planned development would not substantially adversely affect this species' distribution or abundance. Thus, any potential impact would be less than significant. Potential mortality impacts associated with construction would be mitigated to a less-than-significant level by the preconstruction survey measures in the HCP. Moreover, the establishment of habitat that could support this species would benefit Delta tule pea. The species would benefit if it were successfully introduced into the Natomas Basin or if its range expanded and it naturally colonized managed marsh on the habitat reserves.

4.4.5.2.2 Sanford's Arrowhead

Effects of Changes in Habitat. Potential habitat for the Sanford's arrowhead is found in marsh areas. In the Natomas Basin, ponds and seasonally wet areas are the primary potential habitat, although some ditches and canals could provide suitable conditions. Rice lands are not suitable for Sanford's arrowhead because these lands are managed to discourage colonization by plants other than rice and are harvested annually. The habitat classes (from Tables 4-2 and 4-4) that provide potential habitat for Sanford's arrowhead and the changes in acreage from implementing the Proposed Action are presented in Table 4-6.

TABLE 4-6
Change in Potential Habitat for Sanford's Arrowhead (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Ponds and seasonally wet areas	96	(7)	(4)	(10)	(21)	75
Canals (all)	1,778	(117)	(72)	(215)	(404)	1,374
TOTAL	**1,874**	**(124)**	**(76)**	**(225)**	**(425)**	**1,449**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

Ponds and seasonally wet areas occur throughout the Natomas Basin as isolated units; the loss of 21 acres would occur in approximately eight isolated areas subject to urban development in the City near Arco Arena (7 acres), Metro Air Park near I-5 (4 acres), and in various locations in Sutter County (10 acres). Assuming that canals and drains do not remain after development has occurred, about 404 acres of Class II, III, and IV canals and drains would be removed in the development areas, some of which could contain emergent marsh values suitable for Sanford's arrowhead. Because Sanford's arrowhead is not known to occur in the Natomas Basin, the loss of potential habitat because of urban development is not likely to affect this species, and this impact would be less than significant.

Under the Proposed Action, a stable and natural marsh environment would be created on 2,187.5 acres, thereby replacing the loss of 425 acres of potential habitat from urban development. This restored marsh area would substantially increase potential habitat for the Sanford's arrowhead. Because Sanford's arrowhead is not known to occur in the Natomas Basin, this increase in potential habitat on the habitat reserves could have no effect on the species. The Proposed Action, however, includes a measure for the Conservancy to consider introducing the Sanford's arrowhead into suitable locations in the Natomas Basin. If pursued, these introductions would benefit the species by increasing the population size and distribution.

A stable marsh environment would be created as part of the habitat reserve system. This restored marsh area would substantially increase potential habitat for Sanford's arrowhead. Because Sanford's arrowhead is not known to occur in the Natomas Basin, the loss of habitat from covered activities is not anticipated to have an effect on the species. The HCP includes a measure for the Conservancy to consider introducing Sanford's arrowhead into suitable locations in the Natomas Basin, which would benefit the species by increasing its population size and distribution.

Effects of Construction Activities. Sanford's arrowhead is not currently known to occur in the Natomas Basin, but direct mortality during construction is a potentially significant impact with regard to unknown populations. Significant impacts could also occur if areas are colonized by this species in the future. The potential for adverse effects to Sanford's arrowhead would be avoided by the species-specific take-avoidance and minimization measures of the Proposed Action. Under the Proposed Action, surveys for covered species including Sanford's arrowhead would be conducted prior to construction activities. If

Sanford's arrowhead were identified in construction areas, they could be salvaged and transplanted in accordance with the requirements of the California Native Plant Protection Act if deemed necessary and appropriate by the USFWS and CDFG.

Effects of Water Agency and Conservancy Management. Maintenance of the canal and drain system in the Natomas Basin could affect individual Sanford's arrowhead plants. The Natomas Basin is within the known range of Sanford's arrowhead, and this species could inhabit smaller canals and drains. The Proposed Action does not include specific requirements for water agency-covered activities to address potential impacts to Sanford's arrowhead. The likelihood that Sanford's arrowhead could occur in the canals or ditches, however, is low because of the routine sediment and vegetation control-maintenance activities conducted by Natomas Mutual and RD 1000 on the canals and ditches. These types of activities would continue under the Proposed Action. If Sanford's arrowhead occurs, it would have colonized and persisted in the drains or canals coincident with these ongoing activities. Therefore, if Sanford's arrowhead currently occurs in the canals or ditches, it would be expected to persist.

Sanford's arrowhead could colonize portions of the habitat reserves in the future and/or the Conservancy could pursue introductions of this species under the Proposed Action. If Sanford's arrowhead becomes established in the habitat reserves, the Conservancy would implement measures to avoid and minimize take of plants. To determine if this plant colonizes the habitat reserves, the Conservancy will monitor for this species on the habitat reserves.

Overall Effects on Sanford's Arrowhead. This species is not known to occur in the Natomas Basin but potential habitat is present. The small loss of potential habitat from the covered activity of planned development would not substantially adversely affect this species' distribution or abundance. Thus, any potential impact would be less than significant. Potential mortality impacts associated with construction would be mitigated to a less-than-significant level by the preconstruction survey measures in the HCP. The species would benefit if it was successfully introduced to suitable habitat in the Natomas Basin or if it naturally colonized managed marsh on the habitat reserves.

4.4.5.2.3 Vernal Pool Species

Vernal pools represent important remnants of the natural landscape of the foothills and valley floor of the Central Valley. Resulting from a combination of surface topography (shallow, closed depressions) and soil condition (low permeability), vernal pools support numerous special-status species. Ten species inhabiting vernal pools are covered by the ITPs. These species include five plant species, three vernal pool shrimp species, and two amphibian species (Table 4-7). Impacts to these species are assessed collectively in the following analysis because the potential effects to vernal pools from implementing the Proposed Action would be similar for each species. The two amphibian species (California tiger salamander and western spadefoot toad), however, are not restricted to vernal pools and could occupy other types of wetland habitats. Effects of the Proposed Action on these two species are also evaluated separately from this assessment of vernal pool species (see Section 4.4.5.2.4 and Section 4.4.5.2.5).

TABLE 4-7
Vernal Pool Species Covered by the ITPs

Plants	Crustaceans	Amphibians
Boggs Lake hedge hyssop	Vernal pool fairy shrimp	California tiger salamander
Sacramento Orcutt grass	Vernal pool tadpole shrimp	Western spadefoot toad
Slender Orcutt grass	Midvalley fairy shrimp	
Colusa grass		
Legenere		

Source: Proposed Revised Natomas Basin HCP, July 2002

Effects of Changes in Habitat. One small vernal pool complex is known to occur east of the I-5/S.R. 99 split in the City's permit area. Other vernal pools could occur in the grassland areas along the eastern perimeter of the Natomas Basin, including lands in both the City and Sutter County permit areas. In addition, isolated seasonal wetlands could occur elsewhere in the Natomas Basin and could support vernal pool vegetation and special-status vernal pool species. Potential effects of the Proposed Action on vernal pool habitat were described previously.

Effects of Construction Activities. The vernal pools east of the I-5 split and other, currently unknown vernal pool areas (expected primarily in the City's panhandle annexation area and the eastern portion of the Sutter County Industrial-Commercial Reserve) could be directly affected because of urban development or indirectly affected by urban development surrounding the pools. Under the Proposed Action, vernal pool resources within the City and the Sutter County permit areas would be identified prior to disturbance through preconstruction surveys and other biological investigations (e.g., related to CEQA project review required for general plan, specific plan, rezone, subdivision, and other discretionary approvals). Mitigation measures would be implemented as described above under *Vernal Pool Habitat*. Such mitigation would consist of measures substantially consistent with USFWS' *Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Project with Relatively Small Effects on Listed Vernal Pool Crustaceans within the Jurisdiction of the Sacramento Field Office* (USFWS, 1996b).

Construction impacts also could occur during development of the habitat reserve system. Specific locations of all of the reserves have not been identified and, therefore, it is not possible to determine if vernal pools or vernal pool species would be affected. As part of the development of site-specific habitat-creation and management plans, surveys to identify covered species currently or potentially supported by the specific parcel would be conducted as part of the mitigating conservation strategy of the HCP. If vernal pools or vernal-pool species are found, impacts to these resources would be mitigated in the same manner as described in the above paragraph for the covered activity of planned development.

Effects of Water Agency and Conservancy Management. Activities conducted by RD 1000 and Natomas Mutual to maintain ditches and canals are not likely to affect vernal pool species because suitable habitat for these species is restricted to vernal pools. These species are not expected to use water conveyance facilities maintained by RD 1000 and Natomas Mutual.

As described above, habitat creation and management plans for the reserve system would be designed to protect vernal pool resources and associated covered species. The HCP (Section IV.C.5) states the following regarding vernal pool species:

> The primary purpose of listing the vernal pool-associated species within the NBHCP is to provide protection to [the Conservancy] with regard to the management of future wildlife reserves. It is anticipated that the complex of wetland/upland habitat to be developed by [the Conservancy] will provide enhanced opportunities for the establishment and proliferation of these species.

The HCP specifies four measures for the Conservancy to implement that focus on identifying conservation opportunities for the vernal pool species identified in Table 4-7, including the creation of suitable habitat. This has been implemented on the Betts-Kismat-Silva reserve, where a vernal pool complex has been created. Impacts could occur during ongoing Conservancy management, both to vernal pools that could occur on lands to be acquired and to species colonizing new habitat created by the Conservancy. It is expected that the overall impact would be beneficial because the Conservancy has provided new habitat and would continue to seek opportunities for vernal pool habitat improvement in accordance with the HCP conservation measures.

Overall Effects on Vernal Pool Species. Currently, the Natomas Basin contains a minor amount of vernal pool habitat, and use of the Natomas Basin by covered species dependent on vernal pools appears to be very limited. Nevertheless, because vernal pool habitat has been reduced substantially throughout the Central Valley and the plant and crustacean species listed in Table 4-7 are largely dependent on vernal pools, any loss of vernal pool habitat would have a substantial adverse effect on these species. Therefore, the potential loss of vernal pool habitat attributable to the covered activities of urban development would be considered a significant impact to special-status species dependent on vernal pools. With implementation of measures under the Proposed Action to identify vernal pools or seasonal wetlands, avoid or mitigate impacts to vernal pools and associated species, and restore vernal pools, this potential impact would be reduced to a less-than-significant level. Further, one or more of the vernal pool species could benefit if the Conservancy was successful in attracting vernal pool species to the habitat reserves.

4.4.5.2.4 California Tiger Salamander

Effects of Changes in Habitat. Potential habitat for California tiger salamander in the Natomas Basin consists of vernal pools and other ponds and seasonally wet areas and upland areas surrounding these features. Only a few small areas of vernal pools are likely to occur in the Natomas Basin on the eastern edge of the basin. In addition, 96 acres of ponds and seasonally wet areas occur as isolated units throughout the Natomas Basin and are potential habitat for California tiger salamander.

Potential effects of the Proposed Action on habitat for tiger salamander consist of the direct loss of vernal pools, ponds, or other seasonally wet areas because of construction. Indirect effects could also occur. Under the Proposed Action, approximately 21 acres of ponds and seasonally wet areas could be directly affected by development (7 acres in the City, 4 acres in Metro Air Park, and 10 acres in Sutter County), which could reduce the availability of breeding habitat for tiger salamander. Urban development in areas surrounding aquatic habitat also can directly affect habitat for tiger salamander by eliminating upland areas

where tiger salamanders seek refuge during much of the year. Tiger salamanders migrate between upland habitats and aquatic breeding habitat, and urban development around aquatic habitats that tiger salamanders use for breeding can interfere with this movement. In some areas, vehicular traffic can be a major cause of mortality for California tiger salamander during their movements between upland and aquatic habitats.

The Proposed Action includes procedures to avoid, minimize, and mitigate impacts to vernal pools and other seasonal wetlands potentially used by tiger salamanders for breeding. Under the Proposed Action's Vernal Pools Conservation Strategy, if wetlands that support the species would be affected, developers would consult with the USFWS and CDFG to develop appropriate measures to avoid, minimize, and mitigate impacts to the listed species. Although the tiger salamander is not federally listed, consultations for other species associated with wetland habitat would be expected to minimize impacts to this species because replacement of habitat also is typically required by the USFWS to mitigate for the removal of habitat. Thus, the Vernal Pool Conservation Strategy of the HCP would provide protection for aquatic habitats that California tiger salamanders could use. As a result of these requirements, impacts to habitat for this species from urban development would be avoided or mitigated to a level that is less than significant.

Depending on the specific characteristics of the upland and managed-marsh habitat provided on the reserves, tiger salamanders could be attracted to the habitat reserves. As part of the Proposed Action, the Conservancy would periodically consult with experts to identify conservation opportunities for California tiger salamander on the habitat reserves. Such opportunities could include establishment or creation of wetland and upland habitats suitable for tiger salamanders within the reserve system (e.g., stock ponds or "artificial" vernal pools) and, if appropriate, re-introduction of tiger salamanders into the basin.

Effects of Construction Activities. Construction activities within the Natomas Basin are not likely to affect California tiger salamander because this species is not currently known to inhabit the Natomas Basin. It is possible that construction activities could affect existing unknown occurrence of tiger salamanders or areas colonized by this species in the future. Under the Proposed Action, prior to approval of development permits, the City and Sutter County would require preconstruction surveys for tiger salamanders. If preconstruction surveys determine the presence of California tiger salamander, the City and Sutter County would require developers to consult with CDFG to determine appropriate measures to avoid and minimize take of individual animals.

Construction impacts also could occur during development of the habitat reserve system. As part of the development of site-specific habitat-creation and management plans, surveys to identify covered species currently or potentially supported by the specific parcel would be conducted. If tiger salamanders are found, impacts to individuals would be avoided during habitat creation and management activities, and appropriate management activities pursued as necessary to retain habitat values for this species.

Effects of Water Agency and Conservancy Management. The California tiger salamander is not known to occur in the Natomas Basin, and RD 1000's and Natomas Mutual's water conveyance facilities do not provide suitable habitat for this species. The water agencies' covered activities, therefore, are not likely to affect California tiger salamander.

If tiger salamanders occur on the habitat reserves in the future, it is possible that some of the Conservancy's management activities could kill or injure individual animals. Under the Proposed Action, the Conservancy would implement measures to avoid take of California tiger salamanders included in habitat-creation and management-reserve plans. Further, the Conservancy will consult experts periodically during HCP implementation to identify additional conservation opportunities for this species in the habitat reserve system.

Overall Effects on the California Tiger Salamander. Currently, the Natomas Basin is not known to support California tiger salamander and contains a minor amount of potential habitat. Nevertheless, because vernal pool habitat and other potential breeding habitats (e.g., seasonal ponds) have been reduced substantially throughout the Central Valley, any loss of vernal pool habitat or seasonally wet areas that are potentially suitable breeding areas for tiger salamanders would have a substantial adverse effect on this species. Therefore, the potential loss of vernal pool and marsh habitat attributable to urban development would be considered a significant impact to California tiger salamanders. With implementation of the HCP mitigation measures under the Proposed Action to identify vernal pools and seasonal wetlands and avoid or mitigate impacts to these potential habitats for tiger salamander, potential impacts to tiger salamanders would be reduced to a level that is less than significant. Further, California tiger salamander could benefit if the Conservancy was successful in attracting individuals to the habitat reserves or if it re-introduced the species to the habitat reserves.

4.4.5.2.5 Western Spadefoot Toad

Effects of Changes in Habitat. Potential habitat for western spadefoot toad in the Natomas Basin consists of vernal pools and other ponds and seasonally wet areas and upland areas surrounding these features. Only a few small areas of vernal pools are likely to occur in the Natomas Basin on the eastern edge of the basin. In addition, 96 acres of ponds and seasonally wet areas occur as isolated units throughout the Natomas Basin and are potential habitat for western spadefoot toad.

Potential effects of the Proposed Action on habitat for spadefoot toad consist of the direct loss of vernal pools, ponds, or other seasonally wet areas because of construction as well as indirect effects. Under the Proposed Action, 21 acres of ponds and seasonally wet areas could be directly affected by development (7 acres in the City, 4 acres in Metro Air Park, and 10 acres in Sutter County), which could reduce the availability of breeding habitat for western spadefoot toad. Urban development in areas surrounding aquatic habitat also can directly affect habitat for spadefoot toad by eliminating upland areas where this species seeks refuge during much of the year. Spadefoot toads move between upland habitats and aquatic breeding habitat, and urban development around aquatic habitats that are used for breeding can interfere with this movement. Vehicular traffic can cause mortality of spadefoot toads during their movements between upland and aquatic habitats.

The Proposed Action includes procedures to avoid, minimize, and mitigate impacts to vernal pools and other seasonal wetlands potentially used by western spadefoot toad for breeding. Under the Proposed Action's Vernal Pools Conservation Strategy, if jurisdictional wetlands would be affected, developers would consult with the USFWS and CDFG to develop appropriate measures to avoid, minimize, and mitigate impacts to the listed species. Although the western spadefoot toad is not federally listed, consultations for other species associated with wetland habitat would be expected to minimize impacts to this species as

well because replacement of habitat is typically required by the USFWS to mitigate for the removal of habitat. If wetlands that are not jurisdictional would be affected by development, the City and Sutter County would work with the USFWS and CDFG to develop specific measures to avoid, minimize, and mitigate impacts to vernal pool species, including western spadefoot toad. Thus, the Vernal Pool Conservation Strategy of the HCP would provide protection for aquatic habitats that western spadefoot toad could use. As a result of these requirements, impacts to this species' habitat from urban development would be avoided or mitigated to a level that is less than significant. Depending on the specific characteristics of the upland and managed-marsh habitat provided in the reserves, spadefoot toads could be attracted to the habitat reserves. As part of the Proposed Action, the Conservancy would periodically consult experts to identify conservation opportunities for western spadefoot toad on the habitat reserves.

Effects of Construction Activities. Construction activities within the Natomas Basin are not likely to affect western spadefoot toad because this species is not currently known to inhabit the Natomas Basin. It is possible that construction activities could affect existing unknown occurrence of spadefoot toads or areas colonized by this species in the future. Under the Proposed Action, prior to approval of development permits, the City and Sutter County would require preconstruction surveys for spadefoot toads. If preconstruction surveys determine the presence of western spadefoot toad, the City and Sutter County would require developers to consult with CDFG to determine appropriate measures to avoid and minimize take of individuals.

Construction impacts also could occur during development of the habitat reserve system. As part of the development of site-specific habitat-creation and management plans, surveys to identify covered species currently or potentially supported by the specific parcel would be conducted. If western spadefoot toads were identified, impacts to individuals would be avoided during habitat creation and management activities, and appropriate management activities pursued as necessary to retain habitat values for this species.

Effects of Water Agency and Conservancy Management. This species is not known to occur in the Natomas Basin, and RD 1000's and Natomas Mutual's water conveyance facilities do not provide suitable habitat for this species. The water agencies' covered activities, therefore, are not likely to affect western spadefoot toad.

If western spadefoot toads occur on the habitat reserves in the future, it is possible that some of the Conservancy's management activities could kill or injure individual animals. Under the Proposed Action, the Conservancy would implement measures to avoid take of western spadefoot toads included in habitat creation and management plans. Further, the Conservancy will consult experts periodically during implementation of the HCP to identify additional conservation opportunities for this species in the habitat reserve system.

Overall Effects on Western Spadefoot Toad. Currently, the Natomas Basin is not known to support western spadefoot toad and contains a minor amount of potential habitat. Nevertheless, because vernal pool habitat and other potential breeding habitats (e.g., seasonal ponds) have been reduced substantially throughout the Central Valley, any loss of vernal pool habitat or seasonally wet areas that are suitable breeding areas for western spadefoot toads would have a substantial adverse effect on this species. Therefore, the potential loss of vernal pool and marsh habitat because of urban development would be

a significant impact to spadefoot toads. With implementation of measures under the Proposed Action to identify vernal pools and seasonal wetlands and avoid or mitigate impacts to these potential habitats for spadefoot toad, potential impacts to spadefoot toad would be reduced to a level that is less than significant. Further, the species could benefit if the Conservancy was successful in attracting individuals to the habitat reserves or if it introduced the species to the habitat reserves.

4.4.5.2.6 Valley Elderberry Longhorn Beetle

Effects of Changes in Habitat. Riparian habitat potentially supports elderberry shrubs on which the valley elderberry longhorn beetle (VELB) depends. As explained previously, less than 1 acre of riparian habitat would be converted as a result of urban development occurring near the northbound off ramp from I-5 to Del Paso Road. Individual or small groups of shrubs could occur in other planned development areas and could be affected.

Although the covered activity of urban development could result in impacts to some elderberry shrubs, habitat availability for VELB would not be expected to decline in the project area for several reasons. First, if elderberry shrubs occurred in a development area, the shrubs would be transplanted and additional seedlings planted in accordance with the USFWS *Conservation Guidelines for Valley Elderberry Longhorn Beetle* (USFWS, 1999a). As the seedlings developed, habitat for VELB would increase. Second, the riparian corridor along Fisherman's Lake, which supports elderberry shrubs, is expected to remain intact because of the reserve lands on the west side of the lake and agricultural buffer on the City side of the lake. Third, the General Plan Amendment proposed for the 1-mile buffer area in Sutter County along the Sacramento River would protect some riparian habitat potentially containing elderberry shrubs. Last, elderberry shrubs would be planted in the habitat reserves. Accordingly, no significant impacts to VELB would occur. Rather, overall habitat availability in the Natomas Basin would increase for the VELB and much of the habitat would be in areas protected in perpetuity.

Effects of Construction Activities. Although overall habitat availability for the VELB would improve, impacts to individual elderberry shrubs (resulting in potential elderberry beetle mortality) could still occur. Shrubs could be affected during construction associated with urban development or with habitat creation on the reserves. The practice of avoiding and/or mitigating impacts to elderberry shrubs in accordance with the Conservation Guidelines is common in the Central Valley, and would continue to be the required practice with implementation of the Proposed Action. Potential impacts to the valley elderberry longhorn beetle during urban development are addressed in the Proposed Action by requiring compliance with the USFWS' *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS, 1999). Key aspects of the Conservation Guidelines include:

- Surveys for the beetles and elderberry host plants by a qualified biologist prior to construction.
- Avoidance of elderberry bushes with a 100-foot construction buffer area (may be reduced with the approval of the USFWS).
- Mitigation of elderberry bushes where avoidance is not possible. The preferred mitigation is to transplant mature elderberry bushes during their dormant season (when the beetles are in their larval stage in the interior of the plant) to permanent mitigation

lands and to plant a specified number of seedlings; planting additional elderberry seedlings may be allowed when transplanting is not feasible.

Construction impacts also could occur during development of the habitat reserve system. Specific locations of all of the reserves have not been identified and, therefore, it is not possible to determine the number of shrubs that could be affected by development of the habitat reserves. Reserve acquisitions to date have not included lands with existing elderberry shrubs, but it is possible that elderberry shrubs would be present on lands acquired in the future. If elderberry shrubs occur on habitat reserves, the Conservancy would strive to preserve the shrubs. If shrubs must be removed to develop habitat on the reserves, the Conservancy would mitigate in accordance with the Conservation Guidelines.

Effects of Water Agency and Conservancy Management. The existing system of canals and drains in the Natomas Basin is highly maintained, and therefore is unlikely to contain mature elderberry shrubs that are potential habitat for VELB. Some areas under management by RD 1000 and Natomas Mutual (e.g., Fisherman's Lake, RD 1000 Pumping Plant No. 2), however, contain mature riparian habitat that could contain elderberry shrubs. Areas under the management of the water agencies that support mature riparian habitat necessarily are those areas in which the water agencies do not routinely conduct vegetation control. As a result, the water agencies' continued activities are not likely to remove elderberry shrubs supporting or potentially supporting VELB. The potential for removal of elderberry shrubs of sufficient size to support VELB is limited to construction activities associated with facility replacement or restructuring of canals. The number of shrubs potentially affected over the project duration by these activities and their suitability for VELB is unknown, but such construction activities are not a part of the Proposed Action and, therefore, impacts would not occur as a result of the Proposed Action.

Some of the Conservancy's management actions on the reserves have the potential to affect elderberry shrubs. The Conservancy would implement measures to avoid and minimize take of VELB as a result of habitat management actions. The Conservancy would ensure that necessary and appropriate take avoidance measures are included in reserve management plans, as well as additional measures determined to be necessary during the development of management plans.

Overall Effects on Valley Elderberry Longhorn Beetle. Implementation of the covered activities under the Proposed Action has a relatively limited potential to affect elderberry shrubs that are inhabited by VELB or that are suitable habitat for VELB. As a result, these activities under the Proposed Action are not expected to adversely affect VELB directly or indirectly through changes in habitat, and no significant impacts would result. Further, with implementation of the avoidance and mitigation measures for the covered activities, long-term protection of existing riparian habitat, and planting and protection of additional elderberry shrubs on the habitat reserves, implementation of the Proposed Action would increase habitat for VELB in the Natomas Basin resulting in a potential benefit.

4.4.5.2.7 Giant Garter Snake

Effects of Changes in Habitat. Potential habitat for the giant garter snake in the Natomas Basin currently consists of rice fields, irrigation canals and drains, ponds and seasonally wet areas, and uplands adjacent to these habitat types. Wetland habitats are used by snakes during the summer months for foraging and cover. During winter, snakes use upland areas

for hibernation. Upland areas that snakes use for hibernating are always in close proximity to wetland-type habitats, typically within 100 feet but up to 820 feet (Hansen, 1988, cited in USFWS 1999; Wylie et al., 1997).

The amount of rice fields, irrigation canals and drains, and ponds and seasonally wet areas represents total habitat for giant garter snake (both marsh and upland habitat) in the Natomas Basin. For rice fields and ponds and seasonally wet areas, the habitat and land use database incorporates these features into the overall habitat designation so that the acreage estimates for rice and ponds and seasonally wet areas encompassed both marsh and upland areas (i.e., small-scale features such as rice checks, berms, and road embankments that could provide upland habitat are integrated into the more inclusive categories). The acreage estimates for canals and drains also included both the wetted portion of the canal and the adjacent embankments that could provide upland habitat for giant garter snake.

The habitat classes from Tables 4-2 and 4-4 that provide potential habitat for giant garter snake and the changes in acreage from implementing the Proposed Action are summarized for giant garter snake and presented in Table 4-8. As shown in this table, ponds and seasonally wet areas, rice, and irrigation canals and ditches in the Natomas Basin provide approximately 24,567 acres of potential habitat for giant garter snake. (This represents about half the acreage of the entire Natomas Basin study area.) The potential habitat is limited almost exclusively to rice fields and irrigation canals and ditches. Rice fields are intensively managed monocultures that are highly altered from the natural marsh conditions in which the giant garter snake evolved. Native marsh occur on only about 97 acres (approximately 0.2 percent of the Natomas Basin).

TABLE 4-8
Change in Potential Habitat for Giant Garter Snake (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Ponds and seasonally wet areas	96	(7)	(4)	(10)	(21)	75
Rice	22,693	(970)	(1,541)	(5,577)	(8,087)	14,606
Canals (all)	1,778	(117)	(72)	(215)	(404)	1,374
TOTAL	**24,567**	**(1,094)**	**(1,617)**	**(5,802)**	**(8,512)**	**16,055**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

Of this potential habitat acreage, the data in Table 4-8 show that the covered activity of urban development would reduce giant garter snake habitat in the Natomas Basin by about 8,512 acres, to a future condition of approximately 16,055 acres of potential giant garter snake habitat. For several reasons, however, these projected acreages for reduced habitat and future-condition habitat are overestimated.

First, only a portion of the total potential habitat in the Natomas Basin is expected to be used by giant garter snakes because available data suggest this species concentrates its activities along the edges of its potential habitat (wetland/upland interfaces). In rice fields, snakes primarily use edges along the field perimeter or along check structures (Wylie and Casazza, 2000).

Second, portions of Sacramento County and Sutter County (outside of the proposed HCP permit areas for the City and Sutter County) would not be affected by planned urban development. These areas are assumed to provide habitat for snakes in existing rice fields or in the habitat reserve system (i.e., rice or managed marsh) that would be created under the Proposed Action. In addition, where urban development does occur, the activities would be limited to the north and south portions of the basin (i.e., City of Sacramento and the Industrial-Commercial Reserve). As a result, extensive areas in the middle and northwestern portions of the basin would remain as habitat (predominantly as rice or managed marsh).

About 16,055 acres of potential habitat for giant garter snake would remain in the Natomas Basin, which is a reduction of 8,512 acres from the existing level of 24,567 acres. Most of the reduction in potential habitat would be rice (8,087 acres) with only small amounts consisting of canals (404 acres) or ponds and seasonally wet areas (21 acres) that resemble the snake's natural habitat of marsh to a greater degree than rice.

Habitat Loss Mitigation Measures Included in the HCP. Under the Proposed Action, permanent habitat reserves would be created, consisting of 4,375 acres of rice and 2,187.5 acres of managed marsh. The rice within the reserves would most likely be derived from existing rice fields. Thus, 4,375 of the 14,606 acres of rice projected in the basin under the future condition would be incorporated into the reserve system. The 2,187.5 acres of managed marsh could be created from existing rice fields or lands that do not currently provide habitat for giant garter snake. If all of the managed marsh were derived from rice, the net reduction in the acreage of habitat for giant garter snake would be the 8,512 acres attributable to urban development. If all of the managed marsh component of the habitat reserves were created from nonhabitat, then the net reduction habitat for giant garter snake would be about 6,324.5 acres.

The conceptual designs for 1,296 acres of existing reserve lands include creating marsh habitat with a high degree of edge habitat (Natomas Basin Conservancy, 2001). Because of the large amount of edge in the managed marsh, the managed marsh would provide a greater amount of usable habitat than an equivalent acreage of rice.

Although rice provides important habitat for giant garter snakes, the managed-marsh habitat reserves created under the Proposed Action are expected to provide greater quality habitat (on an acre-for-acre basis) than acreage cultivated for rice. Some of the limitations of rice in providing habitat for giant garter snake are described below.

- Rice fields do not provide habitat for giant garter snakes until late spring when the rice plants have grown enough to provide cover and prey levels have developed. Use of rice fields by giant garter snakes is relatively low until summer when the rice plants are established (Wylie and Casazza, 2000).
- Rice fields typically are drained in September, and habitat for snakes can become limited to canals and drains during the last weeks of their active period (Wylie and Casazza, 2000).[2]

[2] There is some uncertainty over whether the timing of draining rice fields is beneficial or detrimental. It has been suggested that the timing of rice field dewatering benefits snakes by concentrating prey in the ditches so that snakes can feed heavily prior to entering hibernation (City of Sacramento et al., 2002).

- Agricultural practices (tilling, grading, and harvesting) and canal maintenance practices in support of agriculture can directly kill or injure snakes (Leidy, 1992).
- Rice fields are periodically rotated to other crops or fallowed and, therefore, do not provide stable, reliable habitat over time. Furthermore, fluctuations in the amount and distribution of rice could affect the distribution, survival, and reproductive success of the giant garter snake.

The 2,187.5 acres of managed marsh on the reserves would provide permanent year-round habitat, currently only provided by the canals and ponds and seasonally wet areas. Urban development is projected to impact 425 acres of canals and ponds and seasonally wet areas. The managed marsh on the habitat reserves would replace this loss of permanent, year-round habitat at greater than a 0.5:1 ratio. The managed marsh also would provide higher-quality habitat for giant garter snakes than canals, further increasing the value of the managed marsh relative to the most similar habitat available that would be affected (i.e., canals and ponds and seasonally wet areas).

The managed marsh would be designed and managed specifically to provide optimal habitat conditions for giant garter snakes and avoid these limitations. Design features and management practices of managed marsh habitat that would benefit giant garter snakes include:

- A high amount of wetland and upland edge habitat to maximize the amount of useable habitat, included in the conceptual designs for 1,296 acres of reserve lands already acquired (Natomas Basin Conservancy, 2001). Because of the large amount of edge in the managed marsh, the managed marsh would provide a greater amount of useable habitat than an equivalent acreage of rice.
- Potholes (i.e., areas of deeper water) to provide habitat in late summer and fall after the rice fields have been drained.
- A water-management regime that provides habitat throughout the snakes' active period.
- Year-round wetland habitat to maintain prey populations and avoid a delay in development of prey populations in the spring when snakes emerge from hibernation.
- Integration of upland habitat with marsh habitat so that snakes are not exposed to hazards such as crossing roads when they move into hibernation habitats.
- Absence of mortality sources associated with rice production (e.g., canal maintenance activities, pesticide use).

Finally, the creation of marsh and upland habitat in the reserves would emphasize restoration to a natural marsh ecosystem. The habitat reserves would replace rice, an artificial, intensively managed monoculture, with a native ecosystem characterized by a complex structure and high habitat diversity. With the re-creation of the native ecosystem, the habitat reserves would provide the natural habitat conditions under which the giant garter snake evolved. Natural marsh habitat is nearly absent from the Natomas Basin, consisting of only about 97 acres. Under the Proposed Action, marsh habitat acreage would be increased to more than 20 times the existing acreage. Wylie and Casazza (2000) found that giant garter snakes at Fisherman's Lake seldom ventured into surrounding rice fields.

These observations indicate that snakes were able to find adequate resources (e.g., prey, basking sites, cover, hibernation habitat) in Fisherman's Lake to support themselves. Wylie and Casazza (2000) suggested that created marsh, such as would occur under the Proposed Action, could similarly fulfill these habitat requirements for snakes.

Management of the marsh reserves could be modified based on monitoring data, new species information, or other factors, as described in the adaptive management provisions of the HCP (see Section 2.4.7 of this EIR/EIS). Such modifications, which are an important component of the habitat conservation strategy for giant garter snakes, would help ensure that the needs of giant garter snakes are considered in perpetuity.

About 8,087 acres of rice would be affected by urban development. Although the habitat reserves would contain about one-half this amount of rice (4,375 acres), the rice fields in the reserve system also could provide higher habitat quality than the rice fields that would be converted by the covered activity of planned development. Rice in the reserve system would be managed using snake-friendly techniques, including:

- 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 prey species (e.g., mosquito fish) in or near the rice fields through appropriate management
- Other measures, as appropriate

Specific measures for managing rice fields in the reserve system would be determined by the HCP Technical Advisory Committee. In addition to the direct removal of habitat, urban development can indirectly affect snakes through increased predation and vehicle strikes as follows:

- Free-ranging domestic cats often are introduced by the establishment of residential areas. Residential development close to areas inhabited by snakes can lead to increased predation by cats. While predation by cats on giant garter snakes is believed to occur, its impact on snake populations has not been determined.
- Mortality to snakes from vehicle strikes also has been reported (Leidy, 1992). Snakes could experience increased mortality from increased motor vehicle activity associated with urbanization.

Under the Proposed Action, habitat reserves would be located at least 800 feet from urban areas and areas designated for urban development (unless a smaller distance is approved by CDFG and USFWS on a case-by-case basis) and a buffer at least 30 feet wide established within the reserve between marsh habitat and roadways (see Section IV.C [Conservation Strategies to Mitigate For Urban Development] in the HCP). By locating habitat for snakes away from urban areas and creating a buffer between snake habitat and roads, death or injury to snakes from vehicle strikes and predation by cats could be reduced, although not eliminated.

Summary of Effect to Habitat. In summary, implementation of the Proposed Action is expected to result in a net loss of habitat for the giant garter snake in the Natomas Basin. The reduction in habitat value, however, is expected to be less than indicated by the acreage reduction because:

- Snakes primarily use the edges of rice fields, not the entire rice field. Because snakes would not use all the acreage identified as rice habitat, the actual amount of giant garter snake habitat in the Natomas Basin is not directly correlated to the changes in land use acreage that resulted from the land use analysis.
- Managed-marsh land would provide more habitat for snakes than rice fields on an acre-for-acre basis because of the larger amount of edge habitat.
- Managed-marsh habitat would be designed to accommodate year-round habitat requirements, as previously described.
- Rice in the reserve system would be managed to provide better habitat quality than existing rice fields.

Based on the provisions of the HCP, implementation of the Proposed Action would offset impacts to the giant garter snake habitat. Thus, implementation of the Proposed Action would have a less-than-significant effect on giant garter snake habitat and no additional mitigation measures (other than the conservation strategy of the HCP) are required.

Effects of Construction Activities. Urban development and the construction of habitat reserves are anticipated to affect habitat for the giant garter snake as described above. Giant garter snakes also could be killed or injured during construction by vehicle strikes on roads, crushing beneath heavy construction equipment, or entombment in their winter retreats. Death or injury to snakes has been reported because of vehicle strikes on roads (Leidy, 1992) and excavation from winter retreats (Wylie and Casazza, 2000).

Avoidance and Mitigation Measures Included in the HCP Related to Construction Activities. The Proposed Action includes measures to avoid and minimize direct loss of giant garter snakes from construction (see Section V.A [Land Use Agencies' Conservation Measures] in the HCP). Both the Conservancy and individual developers would implement the following measures to avoid and minimize the potential to take snakes during construction activities.

- Timing restrictions: No grading, excavating or filling activities will take place within 30 feet of existing giant garter snake habitat between October 1 and May 1, unless approved by CDFG. By conducting earth-moving activities during the summer months when snakes are active, it is expected that snakes in the construction area will be able to avoid construction equipment such that direct injury or mortality would be avoided. Further, snakes will not be in their winter retreats where they are vulnerable to injury during earth-moving activities.
- Dewatering requirements: Dewatering of existing habitat will begin after November 1, but no later than April 1 of the following year. All water must be removed from existing habitat by April 15, or as soon thereafter as weather permits, and the habitat will be kept dry without any standing water for 15 consecutive days after April 15 and prior to excavating or filling the dewatered habitat. By dewatering habitat between November 1 and April 1, snakes would not be attracted to construction zones when they emerge from their winter retreats. If habitat must be dewatered after April 15, it must remain dry for 15 consecutive days prior to excavating or filling the habitat. Snakes have been found to leave habitat within a few days of dewatering (USFWS, 1999b). By waiting for 15 days

after dewatering, it reasonable to expect that any snakes would have left the construction zone prior to the start of construction activities and injury to snakes would be avoided.

Summary of Effects from Construction Activities. In combination, these measures would minimize direct injury and mortality to giant garter snakes. Therefore, implementation of the Proposed Action would reduce construction impacts to a less-than-significant level and no further mitigation measures are required.

Effects of Water Agency and Conservancy Management. Canals and ditches provide important habitat for giant garter snakes in the Natomas Basin. In Wylie and Casazza's (2000) radio-telemetry study, about half of the snake locations during the summer were in rice and half were in ditches. In the spring (before the rice fields had developed), however, the majority of snake locations were in ditches. During the spring and fall, ditches can be the only habitat available to snakes in rice-producing areas (Wylie and Casazza 2000). In addition to providing habitat, ditches could be important in maintaining population connectivity.

RD 1000 and Natomas Mutual are responsible for maintaining and operating the ditches and canals in the Natomas Basin. The quality of ditches as habitat for snakes can be influenced by operation and maintenance practices that affect the amount of vegetation, the presence of water in the ditches, and the availability of burrows in canal banks that snakes can use for escape or as winter retreats. Further, giant garter snakes can be killed or injured by maintenance equipment, such as mowers and construction equipment used for sediment removal and bank resloping (Leidy, 1992).

Avoidance and Mitigation Measures Included in the HCP Related to Water Agency and Conservancy Management. Under the Proposed Action, RD 1000 and Natomas Mutual would implement practices to avoid and minimize adverse effects to giant garter snakes from their operation and maintenance activities (see Section V.C [Water Agencies' Conservation Measures] in the HCP). These measures include:

- Restrictions on timing of management activities. Where giant garter snakes are known to exist, maintenance activities (excluding vegetation control, road maintenance, and rodent control) will be restricted to after May 1 and before October 1 in any calendar year. By conducting in-channel maintenance activities during the summer when the snakes are active, it is expected that snakes will be able to avoid equipment and thereby avoid injury. Further, the potential for snakes to be killed or injured in their winter retreats by ditch cleaning (e.g., sediment removal) would be avoided.

- Dewatering of ditches and canals identified for maintenance. Dewatering two weeks prior to construction removes an essential element (aquatic features) of giant garter snake habitat. Snakes have been found to leave dewatered habitat within a few days of dewatering such that it is reasonable to expect that snakes would leave the construction area in search of more suitable habitat and would not reenter the construction area.

- Restrictions on management intensity. RD 1000 and Natomas Mutual will limit canal and ditch maintenance activities (excluding vegetation control, road maintenance, and rodent control) during any calendar year to not more than 10 percent of the total miles of canals and ditches within each agency's respective service area. Vegetation control would be limited to one side of the ditch per year. Fitch (1940, cited in Leidy, 1992) noted that the

banks of ditches where he was searching for snakes were usually overgrown with tules, willows, and weeds, making it difficult to see snakes. Later, Hansen (1980, cited in Leidy, 1992) reported that canals cleared of vegetation were rarely used by snakes, while ditches supporting tules and willows appeared to be good habitat. Thus, vegetation that potentially provides habitat for snakes would be retained on one side of the ditch and the ditch could continue to provide cover for snakes following maintenance activities.

- Management of vegetation-control measures in giant garter snake habitat. Burning would be restricted to October 1 through April 30 when snakes are inactive. When mowing for weed control, mower blades would be kept at least 6 inches high, so that the blades would not contact snakes on the banks.

Some of the activities conducted by the Conservancy to manage the habitat reserves have the potential to kill or injure giant garter snakes. For example, the Conservancy conducts ditch and canal maintenance activities similar to those conducted by RD 1000 and Natomas Mutual to maintain appropriate water delivery and drainage from rice and managed marsh units. Under the Proposed Action, the Conservancy would implement take-avoidance measures to minimize potential take that may occur on reserve lands (e.g., road kills, take during construction of managed marsh wetlands, etc.). To accomplish this, the Conservancy would, where applicable, ensure that all take-avoidance measures described in Section V (Take Avoidance, Minimization and Mitigation) in the HCP (e.g., dewatering of irrigation ditches owned by the Conservancy) are implemented during management of reserve lands. The Conservancy also would implement take-avoidance measures included in habitat creation and management plans.

In managing rice fields on the habitat reserves, the Conservancy would implement conservation measures to enhance habitat values and minimize the potential for injury to snakes. The measures include guidelines related to vegetation management (including weed management, treatment of crop stubble through burning and disking, and use of herbicides), and maintenance of those ditches that are owned by the Conservancy (time of maintenance, alternating bank maintenance on an annual basis). Section IV.D (Reserve Management/Site Specific Management Plans) of the HCP provides additional information on the conservation measures that the Conservancy would implement.

Summary of Effects from Water Agency and Conservancy Management. Implementation of the above measures by RD 1000, Natomas Mutual, and the Conservancy would minimize impacts to giant garter snakes to a less-than-significant level.

Overall Effects on Giant Garter Snake. The current distribution and abundance of the giant garter snake is considerably reduced from former times (*FR* 58:54053). The population reduction and range restriction has been largely attributed to conversion and loss of wetland habitat in the Central Valley. Loss of habitat is considered the primary threat to the persistence of the giant garter snake and the primary factor limiting the abundance and distribution of the population (USFWS, 1999b).

Within suitable wetland habitat, the factors determining the population size and distribution of giant garter snake are poorly understood. Prey availability can influence the total population size and reproductive success. Whether prey availability drops to levels that limit the population, however, has not been determined. Hypothesized or documented sources of mortality include predation, dormant season flooding, road kill, mechanical

injury, pest control, collection and vandalism, disease and parasites, and toxic substances (Leidy, 1992). The relative importance of these sources of mortality in determining the size, distribution, and trend of the population remains uncertain.

The Natomas Basin is located within the American Basin population area of the giant garter snake which, when combined with the Colusa Basin and Sutter Basin, represents the largest extant population of giant garter snakes. Giant garter snakes have been reported in the American Basin since the 1970s (Leidy, 1992). Recent investigations of giant garter snakes in the Natomas Basin found a wide range of size classes (Wylie and Cassaza 2000). The range of size classes suggests that the population is reproducing, juveniles are being recruited into the population, and adults are surviving to older age classes.

Implementation of the Proposed Action is expected to result in a net loss of habitat for giant garter snake. Despite a net loss of habitat, implementation of the Proposed Action would encourage the persistence of giant garter snakes in the Natomas Basin for several reasons. First, the loss of habitat is expected to be less than projected based solely on the acreage conversion resulting from the planned development because: (1) the acreage of rice that is used by snakes is likely overestimated because the snakes tend not to use the open water areas of the field, and (2) the managed marsh habitat would be designed to provide a large amount of edge habitat. Second, both the managed marsh and rice created in the habitat reserve system would have a greater value as giant garter snake habitat than would the habitat affected by urban development. This higher-quality habitat could support a larger population of snakes as a result of improved habitat conditions (e.g., more prey) or reduced mortality (e.g., fewer road kills). Third, the habitat reserves would provide habitat that is stable in location, amount, availability, and quality for years over the long term, thereby providing conditions conducive to supporting a stable population of giant garter snakes. Fourth, management actions undertaken by RD 1000 and Natomas Mutual would minimize the potential for death or injury of snakes and, more importantly, would improve the availability and stability of habitat for snakes in the canal and drain system over the long term by allowing suitable habitat conditions to persist in the canals and ditches. This habitat would have the dual benefit of providing additional habitat for snakes and travel corridors to maintain population connectivity.

Finally, portions of lands adjacent to the east and west sides of Fisherman's Lake, a well-documented area for giant garter snakes, will be preserved. Wylie and Casazza (2000) found that snakes using Fisherman's Lake remained within the lake, and did not exploit surrounding ricelands. They suggest that Fisherman's Lake provided a stable habitat so that snakes rarely needed to leave to fulfill their life requisites. With the persistence of buffer lands along both the east and west sides of Fisherman's Lake and management to maintain its habitat value, this known population of snakes would be protected. Creation of managed-marsh habitat under the Proposed Action would result in additional "stable" habitats, and in combination with Fisherman's Lake and remaining rice fields, encourage the persistence of giant garter snakes in the Natomas Basin.

A primary goal of the HCP is to ensure connectivity among individual reserves, and among the reserves and surrounding agricultural lands. The primary opportunity for connectivity among reserves is the system of channels maintained and operated by RD 1000 and Natomas Mutual. These agencies have noted that the elimination of existing channels would generally occur only in response to urban development. RD 1000 and Natomas Mutual

would manage ditches and canals in a manner that would allow and encourage continued use by snakes. With regard to basin-wide connectivity, RD 1000 identified key drainage channels within the Natomas Basin that would be retained regardless of urban development (see Figure 17 in the HCP). With the exception of one property in the northeastern portion of the basin, all of the Conservancy lands acquired to date are interconnected by drainage channels that will remain despite urban development. In addition to these drainage channels, canals and ditches would remain in areas continuing to be in agricultural production. Because snakes readily and routinely use canals and drains in the Natomas Basin (Wylie and Cassaza, 2000), the canal and drainage systems would provide for movement of snakes among the habitat reserves, thereby minimizing the potential occurrence of adverse effects resulting from small and isolated populations.

Urban development would substantially reduce the amount of habitat (i.e., rice and ponds and seasonally wet areas) for giant garter snakes in the Natomas Basin and, therefore, could result in significant impacts to this species. Under the Proposed Action, however, it is anticipated that the preservation of wetland habitat and the creation and management of reserves that support 6,562 acres of habitat for giant garters snake would provide similar or better overall habitat value to that of the 8,512 acres of potential habitat consisting predominantly of rice that would be lost to urban development. The 2,187.5 acres of managed marsh on the reserves would provide permanent year-round habitat similar to that which is provided under existing conditions by the canals and ponds and seasonally wet areas. Urban development is projected to affect only 425 acres of canals and ponds and seasonally wet areas. The managed marsh on the habitat reserves would replace this loss of year-round, permanent habitat at a ratio greater than 0.5:1. The managed marsh also would provide higher-quality habitat for giant garter snakes than is currently provided by canals. This would further increase the value of the managed marsh relative to the most similar habitat available that would be affected (i.e., canals and ponds and seasonally wet areas). About 8,087 acres of rice would be affected by urban development. Although the habitat reserves would contain about one-half this amount of rice (4,375 acres), rice on the reserves would provide better habitat conditions for snakes because it would be stable in space and time and would be managed in accordance with techniques that benefit wildlife. Thus, impacts to giant garter snakes attributable to the 17,500 acres of urban development covered by the Proposed Action are expected to be mitigated to a less-than-significant level. The conservation strategy of the HCP mitigates the impacts of the covered activities on giant garter snakes to a less-than-significant level and is an important component in maintaining giant garters snakes in the Natomas Basin.

4.4.5.2.8 Northwestern Pond Turtle

Effects of Changes in Habitat. Northwestern pond turtles are highly aquatic and are closely associated with wetland and aquatic habitats. In the Natomas Basin, potential habitat consists of canals, rice, ponds and seasonally wet areas, and riparian. Turtles use upland areas for hibernation and for nesting. Upland areas used by turtles typically are close to aquatic habitats but can be as far as 1,300 feet from water.

The amount of rice fields, irrigation canals and drains, ponds and seasonally wet areas, and rice is used to represent total habitat for the northwestern pond turtles (both marsh and upland habitat) in the Natomas Basin. For rice and ponds and seasonally wet areas, the habitat and land use database does not distinguish small-scale features such as rice checks, berms, and road embankments that could provide upland habitat. Rather, these features are

incorporated into the overall habitat designation so that the acreage estimates for rice and ponds and seasonally wet areas include both marsh and upland areas. The acreage estimates for canals and drains also include both the wetted portion of the canal and the adjacent embankments that could provide upland habitat for turtles. The habitat classes (from Tables 4-2 and 4-4) that provide potential habitat for northwestern pond turtles and the changes in acreage from implementing the Proposed Action are presented in Table 4-9. Based on the GIS database, the Natomas Basin supports about 24,691 acres of habitat (marsh and upland combined) for pond turtles.

TABLE 4-9
Change in Potential Habitat for Northwestern Pond Turtle (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Ponds and seasonally wet areas	96	(7)	(4)	(10)	(21)	75
Rice	22,693	(970)	(1,541)	(5,577)	(8,087)	14,606
Riparian	124	(24)	0	0	(24)	100
Canals (all)	1,778	(117)	(72)	(215)	(404)	1,374
TOTAL	**24,691**	**(1,118)**	**(1,617)**	**(5,802)**	**(8,536)**	**16,155**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

Under the Proposed Action, potential habitat for northwestern pond turtles would decline by about 8,536 acres as a result of the covered activity of urban development. This reduction in habitat would predominantly consist of rice fields, although about 404 acres would be canals. No substantial change in riparian habitat would occur because most of the 24 acres of riparian habitat in the City of Sacramento occurs along Fisherman's Lake. Under the Settlement Agreement and as part of the Proposed Action, the riparian habitat adjacent to Fisherman's Lake thus would be retained. About 16,155 acres of potential habitat for northwestern pond turtles would remain in the Natomas Basin (assuming no change in land use in Sacramento County other than at Metro Air Park and inconsequential loss of riparian habitat in the City of Sacramento as described above), a reduction of 8,436 acres from the existing level of 24,691 acres. Under the Proposed Action, permanent habitat reserves would be created consisting of 4,375 acres of rice and 2,187.5 acres of managed marsh. The rice within the reserves would most likely consist of existing rice fields. Thus, 4,375 of the 14,606 acres of rice projected in the basin under the future condition would be incorporated into the reserve system. The 2,187.5 acres of managed marsh could be created from existing rice fields or lands that do not currently provide habitat for northwestern pond turtles. If all of the managed marsh was derived from rice, the net reduction in the acreage of habitat for northwestern pond turtles would be the 8,536 acres attributable to urban development. If all of the managed marsh component of the habitat reserves was created from nonhabitat, then the net reduction habitat for northwestern pond turtles would be about 6,324.5 acres.

The 2,187.5 acres of upland habitat in the habitat reserves could be equally important to the managed marsh in supporting pond turtles. Pond turtles require upland sites for over-wintering and nesting. The availability and suitability of nesting habitat could be

contributing to poor recruitment in northwestern pond turtle populations (Jennings and Hayes, 1994). The habitat reserves would provide this critical element in the maintenance of pond turtle populations.

In addition to reducing habitat availability, urban development in areas adjacent to those inhabited by pond turtles could indirectly impact this species. Free-ranging domestic cats are often introduced to an area by the establishment of residences. Residential development close to areas inhabited by turtles can lead to increased predation by cats. Although predation by cats on northwestern pond turtles has not been specifically identified as a concern, predation by other terrestrial predators (e.g., nonnative red fox, raccoons) has been noted (Jennings and Hayes, 1994). Mortality to turtles from vehicles also is possible and turtles could experience increased mortality from increased motor vehicle activity associated with urbanization. Under the Proposed Action, habitat reserves would be located at least 800 feet from urban areas and areas designated for urban development (unless a smaller distance is approved by CDFG and USFWS on a case-by-case basis) and a buffer at least 30 feet wide established within the reserve between marsh habitat and roadways. By locating habitat reserves away from urban areas, the potential for death or injury to turtles from vehicle strikes and predation by cats could be reduced, although not eliminated.

Despite the net reduction in the total amount of potential habitat, the Proposed Action likely would improve habitat conditions for northwestern pond turtles through the creation and protection of marsh complexes on the habitat reserves. Rice fields provide poor habitat quality for northwestern pond turtles as they are intensively managed monocultures with little structural or biological diversity. In particular, an abundance of basking sites (a key element of pond turtle aquatic habitat) is lacking in rice fields. Beneficial components of the habitat reserves include:

- Long-term certainty of habitat availability. Created marsh habitat would be protected in perpetuity.
- Higher-quality habitat than rice. Created marsh habitat would provide all essential habitat elements for northwestern pond turtles, e.g., basking sites, cover, and prey availability.
- Nearby suitable and undisturbed nesting and wintering habitat.
- Provision of large areas of contiguous, suitable habitat.
- Reduced exposure to agricultural practices. Current agricultural practices involve the routine use of pesticides and fertilizers as well as exposure to heavy farm machinery (e.g., disking or harvesting). The created marsh would not be subject to this type of maintenance and rice would be managed using wildlife-friendly techniques.
- The Conservancy would consult with pond turtle experts during implementation of the Proposed Action to identify management actions to further improve habitat quality for pond turtles.

Lastly, under the Settlement Agreement and Proposed Action, lands immediately adjacent to the west side of Fisherman's Lake have been acquired, and an agricultural buffer would be preserved on the City side of Fisherman's Lake. Fisherman's Lake is known to be

inhabited by pond turtles. With acquisition of the buffer lands adjacent to the lake, the probability of this population persisting would be improved.

Effects of Construction Activities. The covered activity of urban development and the Proposed Action's construction of habitat reserves are anticipated to reduce the amount of habitat for northwestern pond turtles in the Natomas Basin, as described above. Pond turtles could be killed or injured during construction by vehicle strikes on roads, crushing beneath heavy construction equipment, or entombment in their winter retreats. Measures in the Proposed Action to avoid and minimize these types of direct impacts to giant garter snakes also would benefit pond turtles because of their similar habitat requirements and life history traits. The avoidance measures for giant garter snakes would have similar beneficial effects to pond turtles, and implementation of the measures in the HCP would result in less-than-significant impacts.

Effects of Water Agency and Conservancy Management. Operation and maintenance activities by RD 1000 and Natomas Mutual could affect northwestern pond turtles because these activities typically focus on canals and drains that provide suitable habitat for this species. Pond turtles could be killed or injured by construction equipment used for sediment removal. Carrying out the covered activities also could result in the removal of bank and emergent vegetation, important components of cover for the northwestern pond turtle.

Under the Proposed Action, RD 1000 and Natomas Mutual would implement measures to avoid and minimize potential impacts on the giant garter snake. Pond turtles have similar seasonal activity patterns and habitat requirements as giant garter snakes. The effects of the water agencies' covered activities (including implementation of the avoidance and minimization measures of Proposed Action) on pond turtles would be the same as described for giant garter snakes.

Some of the activities conducted by the Conservancy to manage the habitat reserves have the potential to kill or injure pond turtles. For example, the Conservancy conducts ditch and canal maintenance activities similar to those conducted by RD 1000 and Natomas Mutual to maintain appropriate water delivery and drainage from rice and managed-marsh units. The Conservancy would implement take-avoidance measures to minimize potential take that may occur on reserve lands (e.g., road kills, take during construction of managed marsh wetlands, etc.). To accomplish this, the Conservancy would, where applicable, ensure that all take-avoidance measures described in Section V (Take Avoidance, Minimization, and Mitigation) of the HCP (e.g., dewatering of irrigation ditches owned by the Conservancy) are implemented during management of reserve lands. The Conservancy also would implement take-avoidance measures included in habitat creation and management plans. These measures would typically include actions that would protect affected species during construction of habitat reserves. An example of such measures for giant garter snake include: (1) implementing habitat construction during the giant garter snakes' active period (May 1 - October 1), (2) implementing a worker awareness program, (3) conducting a survey 24 hours prior to construction, (4) having a biological monitor onsite during the initial week of construction, and (5) dewatering wetted areas, if necessary, to achieve the complete removal of ponded water two weeks prior to construction (Natomas Basin Conservancy, 2001).

In managing rice fields on the habitat reserves the Conservancy would implement conservation measures to enhance habitat values and minimize the potential for injury to pond turtles. These measures include guidelines related to vegetation management (including weed management, treatment of crop stubble through burning and disking, and use of herbicides), and maintenance of those ditches that are owned by the Conservancy (time of maintenance, alternating bank maintenance on an annual basis). Section IV.D (Reserve Management/Site Specific Management Plans) of the HCP provides additional information on the conservation measures that the Conservancy would implement. These practices would have similar effects for pond turtles as described for the water agencies.

Overall Effects on the Northwestern Pond Turtle. Jennings and Hayes (1994) characterized western pond turtles as endangered from the Salinas River south along the California coast, and from the Mokelumne River south in inland portions of the state. In the remainder of the state, Jennings and Hayes (1994) considered the species to be threatened. Although loss of habitat has probably been the primary cause of population reductions of this species, other factors threaten the persistence of pond turtles in remaining habitat. Pond turtles in many locales do not appear to be reproducing well, as evidenced by populations increasingly dominated by adults (Jennings and Hayes 1994). Potential contributors to their poor numbers include predation on hatchlings and juveniles by bullfrogs and introduced fishes, competition with introduced fish, lack of suitable nesting habitat, and impacts to nesting habitat during egg incubation (e.g., agricultural practices, grazing) (Jennings and Hayes, 1994).

The current status of the northwestern pond turtle in the Natomas Basin and factors limiting the population are uncertain. Nevertheless, the Proposed Action is expected to improve the likelihood that pond turtles would persist in the Natomas Basin. The majority of the potential habitat that would be converted by planned development would be rice. Rice provides poor-quality aquatic habitat for northwestern pond turtles and suitable nesting and wintering habitats might not be available near many rice fields. The habitat reserves created under the Proposed Action would provide high-quality aquatic habitat interspersed with and in close proximity to upland habitat suitable for nesting and wintering. As part of the Proposed Action, the Conservancy would work with experts to improve and maintain habitat for pond turtles. Through these consultations, the Conservancy would be able to avoid or minimize factors that are believed to reduce reproduction. Pond turtles are known to occur on some of the Conservancy's lands. If successfully reproducing populations of pond turtles can be established and/or maintained on the habitat reserves, it would substantially benefit this species given its poor reproductive success elsewhere in its range and potentially in the Natomas Basin.

The habitat reserves would improve the likelihood that successfully reproducing populations of turtles would be supported in the basin. In addition, areas currently known to be inhabited by pond turtles (East Drain and Fisherman's Lake) would remain under the Proposed Action. Under the Proposed Action, the City would establish an agricultural buffer along the east side of Fisherman's Lake. The East Drain would not be affected by urban development. If turtles are currently reproducing in these areas, they could persist under the Proposed Action. The creation and long-term management and protection of managed marsh and upland habitat on the reserves under the Proposed Action would reduce potential impacts to northwestern pond turtles to a less-than-significant level.

4.4.5.2.9 White-faced Ibis

Effects of Changes in Habitat. White-faced ibis winter in the Natomas Basin. Potential foraging habitat includes alfalfa, rice, canals, and ponds and seasonally wet areas. The habitat classes (from Tables 4-2 and 4-4) that provide potential habitat for white-faced ibis and the changes in acreage from implementing the Proposed Action are presented in Table 4-10. The Natomas Basin supports about 25,000 acres of these habitats.

Under the Proposed Action, urban development would convert about 8,512 acres of potential habitat for white-faced ibis to nonhabitat. Most of the reduction in potential habitat would be rice. As explained for giant garter snakes, the characteristics and management of rice can limit its value to wildlife. For white-faced ibis (which currently occur in the Natomas Basin during winter), only flooded rice fields in the winter provide habitat; fields that are not flooded provide little or no value. White-faced ibis are associated with emergent wetland habitats, particularly for nesting. Native marsh habitat has been largely eliminated from the Natomas Basin. Although this species is able to exploit flooded rice fields and other agricultural field types (e.g., alfalfa) as wintering habitat, these habitats are not suitable for nesting.

TABLE 4-10
Change in Potential Habitat for White-faced Ibis (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Alfalfa	371	0	0	0	0	371
Ponds and seasonally wet areas	96	(7)	(4)	(10)	(21)	75
Rice	22,693	(970)	(1,541)	(5,577)	(8,087)	14,606
Canals (all)	1,778	(117)	(72)	(215)	(404)	1,374
TOTAL	**24,938**	**(1,094)**	**(1,617)**	**(5,802)**	**(8,512)**	**16,426**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

The reduction in potential foraging habitat would be partially offset by creation and long-term protection of marsh and upland habitat in the reserves. Under the Proposed Action, 8,750 acres of permanent habitat reserves would be created, consisting of 4,375 acres of rice, 2,187.5 acres of managed marsh, and 2,187.5 acres of upland habitat. All this habitat could be used by white-faced ibis. There would still be a net loss of habitat for white-faced ibis in the Natomas Basin, but it is expected that the habitat in the reserves would be of higher quality than the rice fields and canals converted to urban development. Marsh and upland habitat in the habitat reserves would be managed to restore native marsh and upland habitat and to promote wildlife habitat values.

White-faced ibis are more flexible in their use of foraging habitat than nesting habitat and probably are not limited by foraging habitat availability in winter. Under the Proposed Action, foraging habitat would remain abundant in the Natomas Basin (about 16,500 acres plus up to an additional 8,570 acres in the habitat reserves) and in agricultural areas

adjacent to the basin. As a result, the decline in foraging habitat would not be expected to adversely affect ibis using the Natomas Basin. Further, with their long-term protection and management for habitat that is stable in quality and location, the reserves would support continued foraging by white-faced ibis in the Natomas Basin.

White-faced ibis are known to nest in the Central Valley but have not been reported to nest in the Natomas Basin. Managed-marsh habitat on the habitat reserves could attract white-faced ibis to nest. White-faced ibis typically nest in large emergent wetlands with minimal disturbance. These types of conditions would be created in the habitat reserves and could result in the establishment of additional nesting colonies.

Effects of Construction Activities. Construction activities would be required for urban development and for habitat creation and restoration actions for the habitat reserves. These activities have little potential to result in adverse effects to white-faced ibis. This species is not known to nest in the Natomas Basin, but rather uses the basin for foraging during the winter. Potential effects would be limited to displacement of birds foraging or roosting on a field during the initial phases of construction when fields are graded. Because grading typically is done in the spring and summer and ibis occur in the basin in winter, no adverse effects to foraging or roosting birds are expected during construction activities.

White-faced ibis could nest in the Natomas Basin in the future, and construction for urban development on nearby properties or for habitat creation could disturb or displace nesting birds. Because habitat reserves are to be located at least 800 feet away from urban development or areas designated for urban development unless an exception is granted, the potential for this type of impact would be minimized. Finally, under the Proposed Action, surveys would be conducted prior to construction activities. If white-faced ibis occur, disturbance would be avoided during the nesting season to the maximum extent possible. Similarly, the Conservancy would avoid disturbance to white-faced ibis nest sites during reserve management and enhancement activities to the maximum extent practicable.

Effects of Water Agency and Conservancy Management. White-faced ibis could forage in canals and ditches, and management activities by RD 1000 and Natomas Mutual could displace ibis foraging in the drains. The Proposed Action's avoidance and minimization measures for the giant garter snake would reduce the potential for water agencies' covered activities to affect ibis. These measures include:

- Implementation of timing restrictions. Canal and ditch maintenance primarily would be conducted during the summer. White-faced ibis currently are winter residents in the Natomas Basin. By conducting management activities during the summer, potential impacts to ibis would be avoided.

- Dewatering of ditches and canals identified for maintenance. By dewatering canals and ditches two weeks prior to construction, white-faced ibis would seek foraging opportunities in other locations and therefore would not be in the vicinity when maintenance and construction activities are conducted.

- Restrictions on management intensity. RD 1000 and Natomas Mutual will limit canal and ditch maintenance activities (excluding vegetation control, road maintenance, and rodent control) during any calendar year to not more than 10 percent of the total miles of canals and ditches within each water agency's respective service area. Vegetation control

would be limited to one side of the ditch per year. Thus, vegetation that potentially provides habitat for white-faced ibis would be retained on one side of the ditch.

With implementation of these Proposed Action measures, there would be minimal potential for white-faced ibis to be adversely affected by RD 1000 and Natomas Mutual activities and, therefore, any impacts that would occur would be less than significant.

White-faced ibis currently use the Natomas Basin for wintering and migrating. At least over the short-term, white-faced ibis would be expected to use the habitat reserves only for foraging and potentially roosting during the winter or migration. Management actions could temporarily displace foraging birds, but this minor displacement would not have adverse effects on white-faced ibis, as these birds are typically very mobile in their use of foraging habitat during winter and migration.

In the event that white-faced ibis nest on Conservancy lands in the future, management activities could disturb and displace nesting birds. If ibis are found to nest on the habitat reserves, the Conservancy would avoid disturbing nesting birds during management activities.

Overall Effects on White-faced Ibis. Breeding white-faced ibis populations declined in distribution and abundance during the 1960s and 1970s, especially in the western United States (Ryder and Manry, 1994; Shuford et al., 1996). The primary reason for the decline of the white-faced ibis as a nesting species in California was the loss of extensive marsh habitats (Remsen, 1978; Shuford et al., 1996). Pesticides also are believed to have contributed to population declines in the 1960s and 1970s. Since the 1980s, however, there has been an increase in western white-faced ibis populations as a result of improved nesting habitat management, increased planting of alfalfa, and a ban on DDT and other pesticide use in the early 1970s. In California, the winter population appears to have increased especially since the 1970s (Shuford et al., 1996). This increase could be a result of changes in agricultural practices that provide more ibis winter habitat or because the species was overlooked and not surveyed adequately in the early part of the century.

The Proposed Action is not expected to result in adverse effects to white-faced ibis, and could have beneficial effects. Although the Proposed Action would result in a net loss of potential foraging habitat (predominantly rice) for white-faced ibis, potential foraging habitat would remain abundant in the Natomas Basin (about 16,500 acres). Potential foraging habitat also would persist in agricultural areas surrounding the Natomas Basin. Given the abundance of foraging habitat in and around the basin, the reduction in potential foraging habitat under the Proposed Action would not be expected to limit the white-faced ibis population. Therefore, impacts to white-faced ibis from reduction in foraging habitat because of planned urban development would be less than significant.

Of greater concern for white-faced ibis is the availability of large marshes free from disturbance where ibis could nest. Marshes suitable for nesting by white-faced ibis are currently absent from the Natomas Basin. The habitat reserves created under the Proposed Action, however, would create large areas of emergent vegetation that could support nesting by white-faced ibis in the future. Given the small number of nesting colonies known in California, the establishment of a colony at the habitat reserves would benefit this species.

4.4.5.2.10 Tricolored Blackbird

Effects of Changes in Habitat. Tricolored blackbirds are associated with marsh habitat with tall dense stands of cattails or tules. Thickets of willow, blackberry, and wild rose also are used. They forage in these habitats and open habitats such as croplands and annual grasslands. In the Natomas Basin, large canals, ponds and seasonally wet areas, and riparian habitat have the potential to support nesting colonies. For foraging, pasture, annual grassland, alfalfa, rice, and nonrice crops could be used in addition to the nesting habitats. The habitat classes (from Tables 4-2 and 4-4) that provide potential habitat for tricolored blackbirds and the changes in acreage from implementing the Proposed Action are presented in Table 4-11. Based on these definitions, the Natomas Basin currently supports about 1,998 acres of potential nesting habitat and 41,310 acres of potential foraging habitat.

TABLE 4-11
Change in Potential Habitat for Tricolored Blackbird (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Nesting Habitat						
Ponds and seasonally wet areas	96	(7)	(4)	(10)	(21)	75
Riparian	124	(24)	0	0	(24)	100
Canals (all)	1,778	(117)	(72)	(215)	(404)	1,374
Total Nesting	**1,998**	**(148)**	**(76)**	**(225)**	**(449)**	**1,549**
Foraging Habitat Only						
Alfalfa	371	0	0	0	0	371
Nonrice crops	16,686	(4,663)	(325)	(1,529)	(6,517)	10,169
Grassland	886	(427)	0	(134)	(560)	325
Pasture	674	(23)	(22)	(101)	(147)	527
Rice	22,693	(970)	(1,541)	(5,577)	(8,087)	14,606
Total Foraging	**41,310**	**(6,083)**	**(1,888)**	**(7,341)**	**(15,311)**	**25,998**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

A total of 449 acres of potential nesting habitat (consisting of 404 acres of canals, 21 acres of ponds and seasonally wet areas, and 24 acres of riparian) would be converted to urban development as a result of implementing the Proposed Action. For several reasons, however, the loss of suitable nesting habitat is expected to be less than projected based solely on the acreage conversion resulting from the planned development. First, most of the 24 acres of riparian habitat would not be affected by development because it is in the buffer lands adjacent to Fisherman's Lake. Second, much of the acreage of the canals consists of open water with vegetation that could serve as nesting substrates limited to the margins.

The projected loss of potential nesting habitat would be offset by creation of 2,187.5 acres of managed marsh in the habitat reserves created under the Proposed Action. The habitat on the reserves would be designed and managed to promote marsh habitat values. The managed marsh would support emergent marsh vegetation, including cattails and tules, that provide optimal nesting habitat for the tricolored blackbird. The habitat reserves also consist of large blocks that would allow development of large areas of marsh vegetation that are preferred by tricolored blackbirds. Tricolored blackbirds would benefit from the substantial increase in high-quality nesting habitat under the Proposed Action and, therefore, impacts would be less than significant.

In addition to reducing habitat availability, urban development in areas adjacent to areas inhabited by tricolored blackbirds can indirectly affect this species. Free-ranging domestic cats are often introduced to an area by the establishment of residential areas. Tricolored blackbirds are believed to be vulnerable to nest destruction by mammalian predators (Bent, 1958), and residential development close to areas inhabited by tricolored blackbirds could lead to increased predation by cats. Under the Proposed Action, habitat reserves would be located at least 800 feet from urban areas and areas designated for urban development in the applicable plan (unless a smaller distance is approved by CDFG and USFWS on a case-by-case basis) and a buffer at least 30 feet wide established within the reserve between marsh habitat and roadways. By locating habitat reserves away from urban areas, the potential for predation by cats could be reduced although not eliminated.

The total amount of potential foraging habitat would decline in the Natomas Basin by about 15,311 acres. This reduction in potential foraging habitat reflects the diverse foraging habits of tricolored blackbirds. In the Natomas Basin and elsewhere the occurrence and distribution of tricolored blackbird are likely determined by the availability of suitable nesting habitat rather than foraging habitat. Given the current abundance of foraging habitat but scarcity of nesting habitat in the Natomas Basin, the population size and distribution of tricolored blackbird are likely to be limited by the availability and distribution of nesting habitat rather than foraging habitat. With about 25,998 acres of foraging habitat remaining in the basin and their ability to use a wide diversity of foraging, the reduction in foraging habitat is not expected to adversely affect tricolored blackbirds.

Effects of Construction Activities. Construction activities for urban development or associated with habitat creation on the habitat reserves has the potential to disturb nesting birds or directly destroy nests if birds were nesting in vegetation removed during construction. For construction associated with urban development, preconstruction surveys would be conducted. If tricolored blackbirds are found, disturbance to nesting colonies would be avoided during the nesting season to the maximum extent possible. Similarly, the Conservancy would avoid disturbance to tricolored blackbirds' nest sites during reserve management and enhancement activities to the maximum extent practicable.

Effects of Water Agency and Conservancy Management. The water agencies would implement measures to avoid and minimize the effects of their maintenance activities on giant garter snakes. These measures could have some minor benefits to tricolored blackbird. Specifically, the water agencies would limit some of their maintenance activities to 10 percent of the canal and ditch systems annually and only one side of the canal would be treated annually where vegetation control is conducted. These measures would contribute

to maintaining vegetation along the canals and ditches that could provide some nesting opportunities for tricolored blackbirds.

Effects on tricolored blackbirds associated with the water agencies' covered activities are expected to be rare. Canals and drains that would be affected support only limited habitat potentially suitable for tricolored blackbirds, and this species is rare in the Natomas Basin. As such, they are unlikely to occur in areas where management activities are conducted.

A colony of tricolored blackbirds currently occurs on the Betts-Kismat-Silva property that is part of the Conservancy's habitat reserve system. It is likely that tricolored blackbird colonies will become established on other Conservancy lands as managed marshes develop. Management activities on the habitat reserves supporting tricolored blackbirds have the potential to disturb nesting birds or directly destroy nests if vegetation supporting nesting birds is removed during the nesting season. Under the Proposed Action, the Conservancy would avoid conducting management activities that would disturb nesting tricolored blackbirds between April and July or while birds are present.

Overall Effects on Tricolored Blackbirds. The Proposed Action is expected to benefit the tricolored blackbird. Loss of marsh habitat has been the primary factor in the decline of tricolored blackbirds (Kaufman, 1996; DeHaven et al. 1975) and a major component of the Proposed Action is the creation and protection of marsh habitat. With the limited amount of marsh habitat currently in the basin, the habitat reserves would substantially increase the amount of nesting habitat available to tricolored blackbirds. One colony of tricolored blackbirds is already protected on Conservancy lands. With the creation of marsh habitat, additional colonies likely would establish on the habitat reserves and contribute to increasing the size and distribution of tricolored blackbirds in California. Thus, the impacts of the Proposed Action would be less than significant.

4.4.5.2.11 Swainson's Hawk

Effects of Changes in Habitat. The Natomas Basin supports both nesting and foraging habitat for Swainson's hawks. For nesting, Swainson's hawks typically use riparian forest habitats where large trees are available, but can use isolated trees or groves of trees outside of riparian zones (SHTAC, 2000). Of the existing land-use types in the Natomas Basin (see Section 4.4.4), riparian, oak groves, and tree groves are considered potential nesting habitat for Swainson's hawk. Based on these land-use types, the area covered by the Proposed Action supports about 328 acres of nesting habitat for Swainson's hawk (Table 4-12). This acreage does not include riparian habitat along the Sacramento River on the west side of the levees, which is outside of the study area.

Foraging habitat for Swainson's hawk consists of alfalfa, grasslands, pasture and certain row crops such as tomatoes and sugar beets. Lands designated as idle and ruderal also provide foraging opportunities for Swainson's hawk. Although Swainson's hawks have been observed to forage along the margins of rice fields when the fields are flooded, rice provides relatively little habitat for Swainson's hawk; therefore, this habitat type is not considered as foraging habitat in this analysis. Based on this characterization, the Natomas Basin supports about 22,051 acres of foraging habitat for Swainson's hawk. The habitat classes (from Tables 4-2 and 4-4) that provide potential nesting and foraging habitat for Swainson's hawk and the changes in acreage from implementing the Proposed Action are presented in Table 4-12.

TABLE 4-12
Change in Potential Habitat for Swainson's Hawk (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Nesting Habitat						
Riparian	124	(24)	0	0	(24)	100
Oak groves	98	(6)	(2)	0	(8)	89
Tree groves	106	(10)	(23)	0	(33)	73
Total Nesting	**328**	**(40)**	**(25)**	**0**	**(65)**	**263**
Foraging Habitat						
Alfalfa	371	0	0	0	0	371
Idle	1,464	(675)	(50)	(8)	(733)	731
Nonrice crops	16,686	(4,663)	(325)	(1,529)	(6,517)	10,169
Grassland	886	(427)	0	(134)	(560)	325
Pasture	674	(23)	(22)	(101)	(147)	527
Ruderal	1,970	(1,137)	(6)	(88)	(1,231)	739
Total Foraging	**22,051**	**(6,925)**	**(403)**	**(1,860)**	**(9,188)**	**12,862**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

Effects to Swainson's Hawk Nesting Habitat. The land-use analysis indicates that the covered activity of planned urban development could reduce potential nesting habitat by 65 acres. The change in the amount of nesting habitat, however, would be substantially less than this amount for several reasons. Loss of 8 acres of oak groves is attributable to three isolated groves in the Willow Creek area of the City and one 2-acre oak grove on the Metro Air Park property; these mature oak groves are likely to remain after development in accordance with the tree protection requirements of the City of Sacramento and Sacramento County. The 24 acres of riparian lands are primarily located along the east (i.e., City) side of Fisherman's Lake. This area is not designated as exempt from paying mitigation fees, and therefore is included in the calculation of areas to be developed; however, this riparian habitat would not be developed because of the agricultural buffer to be created in this area under the Proposed Action. A small, isolated area of riparian habitat is also located near the northbound I-5 offramp to Del Paso Road. Loss of 33 acres of tree groves is primarily associated with a 21-acre grove in the Metro Air Park property; this grove is not slated for preservation in the Metro Air Park master plan**.** A 6-acre tree grove has been incorporated into the landscape features of the River View Oaks office complex in the City, and a 1.5-acre tree grove will be preserved as part of the Witter Ranch Historic Farm (a county park), pursuant to the North Natomas Community Plan. Four remaining groves totaling approximately 4.5 acres are located as follows: (1) one near the recently annexed City area near where I-80 crosses the Sacramento River, (2) one west of I-5 near the proposed Natomas Crossing Drive overpass (formerly known as South Loop Road), (3) one in the City's proposed "panhandle" annexation area immediately south of Elkhorn Boulevard, and (4) one in the Sutter County Industrial-Commercial Reserve north of Sankey Road.

These four parcels were assumed to be converted to urban development, although preservation could be required during review of site-specific development proposals.

None of the riparian habitat, oak groves, or tree groves that could be lost because of urban development contains Swainson's hawk nest sites. Thus, the projected habitat change would not directly affect the existing Swainson's hawk population in the Natomas Basin.

Nesting Habitat Loss Mitigation Measures Included in the HCP. In addition to the above, the Proposed Action includes measures to protect existing habitat areas that could be used by Swainson's hawks for nesting in the future (see Section 2.4.6.1). The Proposed Action requires:

- Avoiding removal of known nest trees
- Preserving valley oaks, tree groves, riparian habitat, and other large trees wherever possible
- Preserving and restoring riparian habitat, particularly at Fisherman's Lake (see Section V.A Land Use Agencies' Conservation Measures of the HCP)

These measures would contribute to maintaining existing nesting opportunities for Swainson's hawks.

The Proposed Action also includes measures to increase nesting opportunities for Swainson's hawks over the 50 year permit term. Specifically:

- Riparian trees would be planted on Conservancy lands
- Fifteen saplings would be planted on the habitat reserves for every Swainson's hawk nest tree affected by development
- The City would plant 60 sapling trees within 14 months of approval of the HCP
- A tree-planting program would be implemented to plant trees throughout the basin (see Section V.A Land Use Agencies' Conservation Measures of the HCP)

It is estimated that four territories could be affected by development within the City. To reduce the temporal effects associated with the potential loss of these territories, the City would advance funding to plant 60 sapling trees within 14 months of approval of its ITP, thus accelerating development of alternate nest sites to those expected to be affected by development. The tree-planting program and incorporation of riparian trees into the Conservancy's habitat reserves would be particularly beneficial because these measures could facilitate an increase in the number of nesting territories. Portions of the Natomas Basin, particularly the east, support foraging habitat but provide few nesting opportunities. As a result, the available foraging habitat could be underused. The tree-planting program and incorporation of riparian trees on the habitat reserves could create nesting opportunities in areas with limited nesting habitat but that have adequate foraging habitat, and result in an overall increase in the nesting population of hawks in the basin.

In addition to these measures, the Proposed Action recognizes the importance of nesting habitat along the Sacramento River and at Fisherman's Lake. Under the Proposed Action, a

goal of "no net loss" of nesting habitat would be established for the Swainson's Hawk Zone[3] and no development in the Swainson's Hawk Zone would be permitted under the Proposed Action, other than the existing City lands that are currently located in the Swainson's Hawk Zone. Buffer lands would be preserved adjacent to Fisherman's Lake as described previously. This area supports four Swainson's hawk nest sites (SHTAC, 2000). With these measures, the known nesting sites associated with Fisherman's Lake would be protected and additional ones could be created with restoration of riparian habitat on habitat reserves in the Fisherman's Lake area.

Summary of Effects to Swainson's Hawk Nesting Habitat. In combination, all of the above measures would avoid or minimize the loss of occupied and potential nesting habitat while creating additional nesting opportunities. The measures in the Proposed Action would reduce the potential for significant impacts to a level that is less than significant.

Effects to Swainson's Hawk Foraging Habitat. Potential foraging habitat for Swainson's hawks could be reduced by about 9,188 acres (a 42 percent reduction) in the Natomas Basin as a result of urban development. About 12,862 acres of potential foraging habitat would remain in the Natomas Basin. Loss of foraging habitat has the potential to result in indirect impacts to Swainson's hawks.

Foraging Habitat Loss Mitigation Measures Included in the HCP. Under the Proposed Action, 2,187.5 acres would be dedicated to upland habitat in permanent habitat reserves. This upland habitat could consist of existing foraging habitat for Swainson's hawks or could be created from lands that do not currently provide foraging opportunities for Swainson's hawks. If the entire upland habitat component of the habitat reserves consisted of protection of existing habitat, the net reduction in foraging habitat would be the 9,188 acres attributable to urban development. If the entire upland habitat component of the habitat reserves was created from nonhabitat, then the net reduction in foraging habitat for Swainson's hawks would be about 7,000.5 acres (a 32 percent reduction).

The importance of suitable foraging habitat to Swainson's hawks is influenced by its proximity to nest sites. Swainson's hawks have been found to forage up to 18 miles from nest sites, but most foraging occurs much closer to nest sites. Foraging habitat located closer to nest sites is considered to be more important than foraging habitat at greater distances. The CDFG considers habitat within 1 mile of the nest site as more valuable foraging habitat than habitat at greater distances. The acreage of foraging habitat for Swainson's hawk within 1 mile of nest sites is presented in Table 4-13. Of the 22,051 acres that provide potential foraging habitat for Swainson's hawks in the Natomas Basin, about 12,446 acres are within 1 mile of a known nest site.

[3] The "Swainson's Hawk Zone" is defined as a corridor beginning at the Sacramento River levee, extending eastward for 1 mile, and running from the intersection of the Sacramento River and Natomas Cross Canal in the north of the Natomas Basin to where Interstate 80 crosses the Sacramento River. For purposes of this assessment, the Swainson's Hawk Zone is considered to include those Swainson's hawk nest trees that are outside of but immediately adjacent to the Natomas Basin along the Sacramento River.

TABLE 4-13
Change in Foraging Habitat Within 1 Mile of Swainson's Hawk Nest Sites (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Alfalfa	280	0	0	0	0	280
Grassland	51	(21)	0	0	(21)	30
Idle	619	(264)	(47)	0	(311)	308
Nonrice crops	9,698	(2,523)	(232)	(159)	(2,915)	6,784
Pasture	353	(3)	(20)	0	(23)	330
Ruderal	1,444	(868)	(6)	(5)	(879)	565
Total	**12,446**	**(3,679)**	**(305)**	**(165)**	**(4,149)**	**8,297**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

Most of the nest sites in and immediately adjacent to the Natomas Basin are within the Swainson's Hawk Zone along the Sacramento River. In addition to these nest sites, the Cross Canal supports several nest sites. Based on the location of planned urban development, conversion of potential foraging habitat to urban uses would generally occur at distances of greater than 1 mile from nest sites. Of the 12,446 acres of foraging habitat within 1 mile of a nest site, urban development is predicted to convert 4,149 acres of foraging habitat (a reduction of about one-third). More than half this acreage would consist of nonrice crops. With implementation of the Proposed Action, 2,187.5 acres would be acquired and protected and upland habitat created or enhanced as foraging habitat for Swainson's hawk. If upland habitat for the reserves is created from areas that currently do not provide foraging habitat, up to 2,187.5 acres of additional foraging habitat could be created in the basin under the Proposed Action. The Conservancy would prioritize the acquisition of upland reserve sites in the Swainson's Hawk Zone. Following approval of the HCP, Sutter County would initiate a general plan amendment process to redesignate the portion of Sutter County's Industrial-Commercial Reserve in the Swainson's Hawk Zone as agriculture (see Section IV.C Conservation Strategies to Mitigate for Urban Development in the HCP). This redesignation would provide additional assurance that foraging habitat would be maintained for Swainson's hawks.

The net reduction would be at least partially, if not entirely, offset by the greater quality of upland habitat in the habitat reserves. The predominant habitat that would be lost would be nonrice crops. Nonrice crops (e.g., row crops) are used less (Estep, 1989; Babcock, 1995) and considered poorer quality foraging habitat for Swainson's hawk than native grasslands, alfalfa, and pasture. Upland habitat in the reserves would be alfalfa or native grassland and would be managed specifically to provide foraging habitat for Swainson's hawk. Further, the upland habitat in the reserves would be available throughout the entire period of time that the hawks are in the basin and would be stable in amount and location over the long term. In agricultural fields, Swainson's hawks often concentrate foraging in agricultural fields during or immediately following harvest (Estep, 1989). When the fields are not being harvested, prey in agricultural habitats might not be accessible to Swainson's hawks so that the effective amount of habitat is less than indicated by the total acreage. Crop types also

fluctuate in the Natomas Basin and could shift over time to crops that are less favorable to Swainson's hawks for foraging.

The habitat reserves would provide certainty of the amount, quality and location of foraging habitat, resulting in a beneficial effect. Within the habitat reserves, upland habitat would be managed specifically to produce prey for Swainson's hawks. In addition to the upland habitat in the reserves, Swainson's hawks could use portions of the managed marsh, and at times, the rice fields. To provide over-wintering habitat for giant garter snakes, managed marshes would include upland areas. These areas also would provide foraging opportunities for Swainson's hawks. Some of the managed marshes would be seasonal and would not be inundated during the late spring and summer. When not flooded, seasonal marshes could be used by Swainson's hawks if the marshes are colonized by small mammals.

Similarly, rice fields could provide foraging opportunities for hawks for several months each year when they are dry. Under the Proposed Action, 10 percent of the rice on the habitat reserves would be fallowed each year. This would further provide potential foraging opportunities. Collectively, the habitat reserves effectively would provide greater foraging opportunities than indicated by the upland component alone, although the specific amount of foraging habitat available in any given year cannot be quantified.

Importantly, the Conservancy would monitor future proposed development in the Swainson's Hawk Zone, where the majority of known Swainson's hawk nest sites are located (see Section V.B.3.b [The Natomas Basin Conservancy's Conservation Measures] in the HCP). Based on existing general plans, development in this zone is expected to be limited over the permit term. If urban development does occur, however, reserve lands established as mitigation for that development would likewise be located within the Swainson's Hawk Zone. In addition, the Conservancy would 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 (see Section V.B.4.b [The Natomas Basin Conservancy's Conservation Measures] in the HCP).

Summary of Effects to Swainson's Hawk Foraging Habitat. The above actions would help maintain foraging habitat in proximity to a majority of the nesting sites and mitigate losses in the amount of potential foraging habitat in the basin. The measures in the Proposed Action would reduce the potential for significant impacts to a level that is less than significant.

Effects of Construction Activities. Urban development and the construction of habitat reserves have the potential to displace or disturb nesting Swainson's hawks. Nest disturbance from the operation of heavy construction equipment and continued presence of activity near nest sites could cause Swainson's hawks to abandon a nesting attempt or interfere with incubation and feeding of young in a way that reduces nesting success.

Avoidance and Mitigation Measures Included in the HCP Related to Construction Activities. The Proposed Action includes measures to avoid and minimize the potential for impacts to Swainson's hawks from construction associated with urban development and for the habitat reserves (see Sections V.A [Land Use Agencies' Conservation Measures] and V.B [The Natomas Basin Conservancy's Conservation Measures] in the HCP). These measures include:

- Pre-construction surveys to determine whether any Swainson's hawk nest sites occur on or within 1/2 mile of the lands designated for development
- Timing restrictions for construction activity if an occupied Swainson's hawk nest is identified (i.e., defer construction activities until after the nesting season) and then, if unavoidable, the nest tree may be destroyed during the non-nesting season
- An onsite biological monitor (CDFG-approved raptor biologist funded by the developer) would be assigned to the project if construction or other project-related activities that could cause nest abandonment or forced fledging are proposed within the 1/4 mile buffer zone

Summary of Effects from Construction Activities. In combination, the above measures in the Proposed Action would help ensure that nest sites are identified prior to the start of construction and that actions are taken to minimize or avoid adverse effects to the birds during the nesting season. Implementation of these measures would reduce the potential for significant impacts to a level that is less than significant.

Effects of Water Agency and Conservancy Management. Activities conducted by RD 1000 and Natomas Mutual could affect Swainson's hawks during their breeding season. Isolated trees along the canal and ditch system support nesting by Swainson's hawks. Nesting birds could be affected by noise from maintenance equipment, such as mowers and construction equipment used for sediment removal, as well as human activity in the vicinity of an occupied nest. Swainson's hawks that nest in trees along irrigation canals and ditches have selected and used these trees coincident with the ongoing activities. Swainson's hawks that nest in trees on irrigation canals and ditches have successfully fledged young (SHTAC 2001). Thus, no adverse effects to Swainson's hawks are anticipated as a result of ongoing management activities.

Activities by RD 1000 and Natomas Mutual also have the potential to affect Swainson's hawks indirectly through vegetation control and rodent control practices along the ditches and canals. Canal banks can provide foraging opportunities for Swainson's hawks. Management practices can influence the quality of canal banks as foraging opportunities for Swainson's hawk through effects on vegetation and directly through rodent control. Under the Proposed Action, the water agencies would implement conservation measures to maintain vegetative cover on the ditches and canals, providing food and protection for prey species (see Section V.C [Water Agencies' Conservation Measures] in the HCP). The water agencies also would limit rodent-control measures to those necessary to maintain structurally sound flood control levees.

The Conservancy would manage the habitat reserves to provide nesting and foraging habitat for Swainson's hawks. Thus, Conservancy operations and maintenance activities overall would have beneficial effects on Swainson's hawks. For example, under the Proposed Action, the Conservancy would manage upland habitats on the reserves to support mice and insects, promoting a prey base for the hawks. If Swainson's hawks nest on the habitat reserves, operations and maintenance activities would have the potential to disturb nesting birds. Under the Proposed Action, the Conservancy would implement take-avoidance measures to minimize potential take that could occur during

habitat-enhancement and management activities on reserve lands. The Conservancy would implement take-avoidance measures included in habitat-creation and management plans.

Overall Effects on Swainson's Hawk. Swainson's hawks once were one of the most common raptors in California. The breeding population in California has been estimated at about 10 percent of its historic level (Bloom, 1980). The substantial reduction in riparian forest and oak woodland habitat that Swainson's hawks use for nesting has been considered the primary cause of this species' decline in California. Conversion of grassland to agricultural and urban uses also could have contributed to declines, although the hawks have adapted to using some types of agricultural fields for foraging. It is uncertain if the availability and quality of foraging habitat is currently a limiting factor for Swainson's hawks in the Natomas Basin.

Currently, there are 892 known Swainson's hawk nesting site occurrences in California. Three of these occurrences have been extirpated, and seven reported nest sites have not been relocated. Of the remaining 882 known occurrences presumed extant, 141 are reported in Sacramento County, and 53 are reported in Sutter County (CDFG, 2001). The most recent survey of the Natomas Basin (SHTAC, 2001) shows 35 nest sites along the Sacramento River (22 on the east side and 13 on the west side) and 27 nest sites located in the basin, for a total of 62 nest sites in or immediately adjacent to the Natomas Basin. Two of the sites in the basin are considered abandoned, and five of the known nest trees have been removed.

Not including the two abandoned territories, seven of the known nest sites are within the approved development areas of the Proposed Action. As presented on Figure 3-5 of this EIR/EIS, five of these sites are located within the City and two are within Metro Air Park (both of the Metro Air Park nest trees were removed in 2002). Except for one of the sites, all were used in 2001. These seven nest sites have the greatest potential to be affected by the covered activities (i.e., urban development) of the HCP. The planned development could result in the direct loss of nesting habitat at these sites if removal of nest trees is not avoided or if territories are abandoned because of the indirect effects of reduced foraging habitat around the nest site. This potential loss of nesting habitat would adversely affect Swainson's hawks and thereby potentially result in significant impacts to this species.

If the nest trees are retained, three of the territories in the City (NB-1, NB-2, and NB-25) would likely remain viable because of the large amount of foraging habitat available within about one-quarter mile between the City's western edge and the Sacramento River. The remaining two territories in the City (NB-3 and NB-6) would be surrounded by urban development and would be between one-half mile and 1 mile from alternate foraging habitat. These territories have the potential to be abandoned by Swainson's hawk. There are, however, territories in the Natomas Basin that are surrounded by urban development and more than 1 mile from suitable foraging habitat that have successfully fledged young. Thus, these territories could remain occupied if the nest tree is retained. One of the territories in the Metro Air Park area (NB-7) is within about one-quarter mile of foraging habitat that would not be developed and, therefore, is not expected to be lost because of reduced foraging habitat at Metro Air Park. The second nest site at Metro Air Park (NB-26) was a new site in 2001. Fallowing of rice fields in the Metro Air Park property in the last few years could have facilitated establishment of this territory. Little alternate foraging habitat is available near this nest site, and the potential exists for it to be abandoned with development of Metro Air Park.

The potential for urban development to result in abandonment of these nest sites would be a potentially significant impact. Both of the Metro Air Park nest trees were removed in 2002

Overall, two territories with remaining nest trees are considered at risk to be abandoned (NB-3 and NB-6). Although these sites have the greatest potential of those in the basin to be affected by urban development, it is uncertain if they would be abandoned. Nevertheless, the HCP includes restoration actions on the habitat reserves to offset a potential loss of territories, specifically the creation of additional nest sites, implementation of the tree planting program, and restoration of riparian habitat. A short-term reduction in the number of territories could occur prior to the development of alternate nest sites, but over the long term the Proposed Action would encourage the establishment of new territories as long as nesting habitat and not foraging habitat is the primary limiting factor. The short-term reduction in nest trees is mitigated by the requirement under the Proposed Action to plant saplings of suitable nest tree species within 14 months after issuance of ITPs. The preservation of upland habitat, retention of existing nesting habitat, and the creation of suitable nesting habitat in the future under the Proposed Action would reduce potential impacts to territories within the authorized development area to a less-than-significant level.

Urban development could reduce the amount of foraging habitat available within the Natomas Basin as a whole and result in potentially significant impacts to Swainson's hawks. Few territories, however, are likely to be abandoned as a result of the projected reduction in foraging habitat acreage for the following reasons:

- Loss of potential foraging habitat would primarily occur away from nest sites where it is less valuable to nesting Swainson's hawks
- Maintenance of foraging habitat in the Swainson's Hawk Zone would be a focus of the Proposed Action, and most of the nest sites are located in this zone
- Upland reserves would be managed to provide better quality foraging habitat for Swainson's hawk than is provided in agricultural fields
- Foraging habitat is probably not currently limiting because of the large amount of agricultural fields available in the Natomas Basin and surrounding areas and the ability for Swainson's hawks to forage over large distances

Lastly, upland reserve sites in the Swainson's Hawk Zone would be acquired with habitat contiguity as a primary consideration. The acquisitions by the Conservancy would ensure that substantial amounts of Swainson's hawk habitat would be maintained in close proximity to occupied nesting habitat. In addition, acquisition would ensure that upland habitats would be selected using a strategy that maximizes the Conservancy's ability to maintain Swainson's hawks in the basin (i.e., upland habitats would not be randomly selected for the reserve system, either inside or outside the zone). For these reasons, the reduction in foraging habitat associated with the covered activity of urban development is not expected to result in the loss of territories associated with nest trees located outside of the development areas. Therefore, the Proposed Action's conservation program for Swainson's hawks would reduce potential impacts to Swainson's hawks to a less-than-significant level.

4.4.5.2.12 Aleutian Canada Goose

Effects of Changes in Habitat. Aleutian Canada geese do not breed or winter in the Natomas Basin, but could use habitats in the Natomas Basin as a stopover while migrating between breeding grounds in Alaska and wintering grounds in the San Joaquin Valley. Pasture, rice fields, and other croplands in the Natomas Basin could be used by migrating geese for foraging or roosting. Currently, much of the Natomas Basin (40,053 acres) could be used by Aleutian Canada geese. The habitat classes (from Tables 4-2 and 4-4) that provide potential habitat for the Aleutian Canada goose and the changes in acreage from implementing the Proposed Action are presented in Table 4-14. It is important to note that only a portion of the areas designated as nonrice crops constitute potential habitat for the Aleutian Canada geese. Only grain crops such as corn and wheat would likely be used by Aleutian Canada geese; nongrain crops such as tomatoes do not provide habitat. As such, the amount of habitat for Aleutian Canada geese is overestimated in Table 4-14.

TABLE 4-14
Change in Potential Habitat for Aleutian Canada Goose (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Nonrice crops	16,686	(4,663)	(325)	(1,529)	(6,517)	10,169
Pasture	674	(23)	(22)	(101)	(147)	527
Rice (roosting and foraging)	22,693	(970)	(1,541)	(5,577)	(8,087)	14,606
TOTAL	**40,053**	**(5,656)**	**(1,888)**	**(7,207)**	**(14,751)**	**25,302**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

Under the Proposed Action, the total amount of potential habitat for the Aleutian Canada goose would be reduced by about 14,750 acres because of urban development. With urban development of 17,500 acres, an estimated 25,302 acres of potential habitat for Aleutian Canada geese would remain in the basin. The basin would continue to provide for use by migrating geese, given this abundance of potential habitat.

This net reduction in potential habitat for the Aleutian Canada goose is unlikely to result in take of individual geese or affect the viability of the species. Potential habitat would remain abundant in the basin, and agricultural areas are present and abundant both north and south of the basin. State and federal refuges also are distributed along the Central Valley and are managed to provide wintering and stopover habitat for ducks and geese. Further, the Aleutian Canada goose was listed as threatened because of threats on the species' breeding grounds in Alaska; the availability of migratory habitat has not been identified as a limiting factor for this species. Thus, projected changes in the amount of habitat in the Natomas Basin potentially used by Aleutian Canada geese would not be expected to affect the species' population. In the event that use of the Natomas Basin by Aleutian Canada geese increases in the future, the Conservancy would use applicable USFWS-approved recovery or management plans, to implement any additional conservation measures deemed appropriate.

The net loss of potential habitat would be at least partially offset by creation and protection of the Proposed Action's habitat reserves. All of the habitats on the 8,750 acres in the reserve

system would provide potential habitat for Aleutian Canada geese in perpetuity. The system of reserves would provide a mosaic of wetland, upland, and agricultural habitats, all of which could be used by Aleutian Canada geese. The reserves would be protected in perpetuity, thereby providing certainty of the availability of stopover habitat for Aleutian Canada geese over the long term. The stability and quality of habitat provided by the proposed system of permanent reserves would help ensure that Aleutian Canada geese could continue to use the Natomas Basin as a stopover area on their migration.

Effects of Construction Activities. Construction activities associated with urban development or creation of habitat would not be expected to adversely affect Aleutian Canada geese. Potential effects would be limited to displacement of birds foraging or roosting on a field during the initial phases of construction when fields are graded. Aleutian Canada geese only occur in the basin for brief periods during migration and in small numbers during migration such that the potential for construction activities to coincide with the presence of Aleutian Canada geese is minimal.

Effects of Water Agency and Conservancy Management. Operations and maintenance activities by RD 1000 and Natomas Mutual are unlikely to affect the Aleutian Canada goose. These activities would be focused on canals and drains, which do not provide suitable habitat for this species. Further, the Natomas Basin is of limited importance to the Aleutian Canada goose, and the species is highly mobile during potential stopover periods in the Natomas Basin.

Ongoing maintenance of the habitat reserves by the Conservancy would be unlikely to affect the Aleutian Canada goose. Potential effects would be limited to displacement of birds foraging or roosting on a field. Potential disturbance would be of limited scope and short duration. Also, Aleutian Canada geese only occur in the basin for brief periods and in small numbers during migration, so that the Conservancy could schedule maintenance activities to avoid disturbance. If hunting is allowed on the reserves, CDFG requirements would be followed. Hunting would not be allowed if it conflicted with the species' ongoing recovery.

Overall Effects on Aleutian Canada Goose. Aleutian Canada geese use the Natomas Basin to a limited degree during their seasonal migrations. Potential habitat is expected to remain abundant under the Proposed Action. This species is not believed to be limited by wintering habitat so that the reduction in potential habitat in the Natomas Basin should not have any effects on the population. The habitat reserves under the Proposed Action would provide high-quality habitat that is stable in amount and location in perpetuity. The long-term availability of this habitat could be beneficial to the Aleutian Canada goose if future development in the Central Valley substantially reduces other wintering and migratory habitat. Therefore, impacts to this species would be less than significant with implementation of the habitat reserve system under the Proposed Action.

4.4.5.2.13 Burrowing Owl

Effects of Changes in Habitat. Burrowing owls are associated with open grassland habitats. They are dependent on burrowing mammals, particularly ground squirrels, to excavate burrows, and thus their occurrence and distribution is linked to these mammals. In the Natomas Basin, grasslands and pastures provide nesting and foraging habitat for burrowing owls. Burrowing owls also could forage in alfalfa, but nesting would not be expected because of routine disturbance caused by harvesting. Burrowing mammals often create

burrows in road and canal embankments and burrowing owls can be found nesting in these areas. For this analysis, grassland, pasture, and alfalfa are considered habitat for burrowing owl. Based on this definition, the Natomas Basin supports about 1,931 acres of potential habitat for burrowing owls. The habitat classes (from Tables 4-2 and 4-4) that provide potential habitat for burrowing owls and the changes in acreage from implementing the Proposed Action are presented in Table 4-15.

TABLE 4-15
Change in Potential Habitat for Burrowing Owl (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Alfalfa	371	0	0	0	0	371
Grassland	886	(427)	0	(134)	(560)	325
Pasture	674	(23)	(22)	(101)	(147)	527
TOTAL	**1,931**	**(450)**	**(22)**	**(235)**	**(707)**	**1,223**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

Under the Proposed Action, urban development would affect about 700 acres of potential habitat for burrowing owls. Most of the habitat that would be converted would be grassland and pasture in the northern portion of the City's "panhandle" annexation area and the northeastern portion of Sutter County's Industrial-Commercial Reserve. This habitat loss, however, would be offset by the upland mitigation strategy of the Proposed Action.

The upland mitigation strategy of the Proposed Action is to create and maintain optimum nesting and foraging habitat for Swainson's hawk. Upland foraging habitat for Swainson's hawk includes open grassland and pasture areas and field crops (e.g., alfalfa) that are also suitable habitat for burrowing owl. Thus, the 2,187.5 acres of upland habitat in the reserves would be suitable for both burrowing owls and Swainson's hawks. Uplands associated with the wetland reserves could provide additional habitat.

In addition to increasing the total amount of habitat for burrowing owls, habitat in the reserve system would provide better habitat conditions for burrowing owl than the habitat that would be converted to urban use. The Proposed Action requires specific management requirements for burrowing owls on the proposed system of upland reserves. Key requirements include creating mounded areas suitable for burrowing owl nesting, enhancing prey populations, and avoiding disturbance during management activities.

In addition to reducing habitat availability, urban development in areas adjacent to burrowing owl colonies can indirectly impact this species. Free-ranging domestic cats are often introduced to an area by the establishment of residential areas. Residential development close to burrowing owl colonies could increase predation by cats. Nearby residential areas could also lead to harassment of owls by humans. In a Florida study area, harassment of owls by children was a leading cause of nest failures by burrowing owls (Millsap and Bear, 2000). Under the Proposed Action, habitat reserves would be located at least 800 feet from urban areas and areas designated for urban development in applicable plan (unless a smaller distance is approved by CDFG and USFWS on a case-by-case basis),

and human access would be controlled. With these provisions, predation by cats and harassment by humans would be reduced, although not necessarily eliminated.

Effects of Construction Activities. Burrowing owls could be directly affected by construction activities associated with urban development and habitat creation on the habitat reserves. Earth-moving activities can trap or injure owls in their burrows. The Proposed Action requires the following measures to avoid impacts to burrowing owls:

- Preconstruction surveys would be conducted prior to the initiation of grading or earth-disturbing activities to determine if any burrowing owls are using the site for foraging or nesting.
- Occupied burrows would not be disturbed during the nesting season (February 1 - August 31) unless a qualified biologist approved by the CDFG verifies that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.
- If nest sites are found, the USFWS and the CDFG shall be contacted regarding suitable mitigation measures, which may include a 300-foot buffer from the nest site during the breeding season (February 1 - August 31), or a relocation effort for the burrowing owls if the birds have not begun egg-laying and incubation or the juveniles from the occupied burrows are foraging independently and are capable of independent survival.
- If relocation of the owls is approved for the site by the USFWS and the CDFG, the developer shall hire a qualified biologist to prepare a plan for relocating the owls to a suitable site.
- Where onsite avoidance is not possible, disturbance and/or destruction of burrows shall be offset through development of suitable habitation on Conservancy upland reserves.

By following these measures, the potential for injury or trapping of owls in their burrows would be reduced. These measures also require relocation of owls and habitat protection if a colony is displaced by construction. With this requirement, there would be no net change in the number of colonies as a result of urban development.

On the habitat reserves, habitat creation would be designed and conducted so as to avoid impacts to burrowing owl colonies. For example, the habitat creation plan for the Betts-Kismat-Silva property maintains the existing burrowing owl colonies intact. If future land acquisitions support burrowing owl colonies, they would be similarly protected.

Effects of Water Agency and Conservancy Management. Operations and maintenance activities conducted by RD 1000 and Natomas Mutual have the potential to directly and indirectly affect burrowing owls. Activities such as sediment removal have the potential to trap owls in their burrows. Because burrowing owls do not inhabit canal and ditch embankments to a large degree, however, impacts to the burrowing owl population are expected to be infrequent and to affect a small number of owls. Rodent-control activities have the potential to indirectly affect burrowing owls. Burrowing owls are dependent on burrowing rodents to create burrows. Under the Proposed Action, the water agencies would conduct rodent-control activities only as necessary to maintain structurally sound flood

control levees. While not avoiding this potential impact entirely, this measure would reduce the potential impacts of these activities on populations of burrowing mammals on which the burrowing owl depends.

The Conservancy would avoid impacts to burrowing owls during management activities of the habitat reserves by following CDFG's Staff Report on Burrowing Owl Mitigation.

Overall Effects on Burrowing Owl. With the increased amount and quality of habitat for burrowing owls and long-term protection of habitat in the reserve system, the Proposed Action would improve habitat conditions for burrowing owls in the Natomas Basin. Reserve acquisitions to date have included known burrowing owl populations (i.e., Betts-Kismat-Silva), and it is likely that burrowing owls would occur on future reserve lands so that the number of colonies in areas permanently protected would increase. The overall combination of the measures (i.e., preconstruction surveys for covered species and their habitat); species-specific measures (e.g., avoidance of burrow sites during the breeding season both within development lands and reserve lands, species relocation); additional mitigation according to CDFG guidelines; and long-term protection, creation, and enhancement of upland habitat in the reserve system would be expected to at least maintain the existing population level of burrowing owls in the Natomas Basin and potentially increase it over time. Therefore, impacts to burrowing owls under the Proposed Action would be less than significant.

4.4.5.2.14 Bank Swallow

Effects of Changes in Habitat. Bank swallows nest in vertical riverbanks with friable soils. Waterways within the Natomas Basin are largely channelized canals and ditches that are designed to resist erosion and therefore do not support suitable nesting substrates for bank swallows. Bank swallows do not nest in the Natomas Basin and the expected changes in land use do not include the removal or creation of bank swallow nesting habitat.

Bank swallows prey on insects and can forage in a variety of open habitats. However, typically they concentrate foraging in riparian areas, wetlands, and open water habitats (e.g., canals, ponds and seasonally wet areas) where insects tend to be abundant. Grasslands and other croplands also could be foraged. There are no bank swallow nesting colonies in the Natomas Basin, but bank swallows from colonies outside of the Natomas Basin or migrating birds could forage in the basin.

Bank swallows could forage in almost any open habitat in the Natomas Basin. The habitat classes (from Tables 4-2 and 4-4) that provide potential habitat for bank swallows and the changes in acreage from implementing the Proposed Action are presented in Table 4-16. As summarized in Table 4-16, open habitats where bank swallows could forage would decline by about 15,760 acres under the Proposed Action. This reduction in potential foraging habitat would not be expected to adversely affect bank swallows for several reasons. First, the abundance and distribution of bank swallows are determined by the availability and location of suitable nesting substrates rather than the availability of foraging habitat. Second, potential foraging habitat would remain abundant (about 27,500 acres) and, given the low level of use of the Natomas Basin by bank swallows, the habitat remaining in the basin with full implementation of the Proposed Action would be sufficient to support the existing level of use. Also, bank swallows foraging in the Natomas Basin most likely come from nesting colonies on the Sacramento River and probably forage close to the river. The urban

development contemplated under the Proposed Action would occur away from Sacramento River and would not affect the areas likely receiving greatest use by bank swallows.

TABLE 4-16
Change in Potential Habitat for Bank Swallow (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Alfalfa	371	0	0	0	0	371
Grassland	886	(427)	0	(134)	(560)	325
Nonrice crops	16,686	(4,663)	(325)	(1,529)	(6,517)	10,169
Pasture	674	(23)	(22)	(101)	(147)	527
Ponds and seasonally wet areas	96	(7)	(4)	(10)	(21)	75
Rice	22,693	(970)	(1,541)	(5,577)	(8,087)	14,606
Riparian	124	(24)	0	0	(24)	100
Canals (all)	1,778	(117)	(72)	(215)	(404)	1,374
TOTAL	**43,308**	**(6,231)**	**(1,964)**	**(7,566)**	**(15,760)**	**27,547**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

To the extent that bank swallows use the basin, the system of habitat reserves would be managed to provide a marsh ecosystem which would support a greater abundance and diversity of insects than agricultural fields. The creation of reserves could improve foraging opportunities for bank swallows. The habitat reserves also would be protected in perpetuity and provide habitat that is stable in quality and location. The Conservancy would manage the habitat reserves in accordance with applicable USFWS- or CDFG-approved bank swallow recovery or management plans. The Proposed Action also contains management provisions to implement any additional conservation measures deemed appropriate if use of the Natomas Basin by this species increase in the future.

Effects of Construction Activities. No bank swallow nesting colonies are currently recorded in the Natomas Basin, and such colonies are unlikely to occur because suitable nesting habitat (i.e., vertical banks with fine-textured soils) is absent. Accordingly, construction-related impacts are unlikely to occur. The Proposed Action requires that surveys be conducted prior to the approval of the urban development permit. In the event that a bank swallow nestingcolony is found in a development area, impacts would be avoided during the nesting season. Similarly, in creating habitat on the habitat reserves, the Conservancy would avoid impacts during the nesting season if a nesting colony occurs on the habitat reserves.

Effects of Water Agency and Conservancy Management. Operations and maintenance activities by RD 1000 and Natomas Mutual are unlikely to affect the bank swallow. These activities would be focused on canals and drains, which do not provide suitable nesting habitat for this species. Operations and maintenance activities would not preclude or interfere with foraging by bank swallows.

Ongoing management of the habitat reserves by the Conservancy is unlikely to affect the bank swallows because suitable nesting habitat is not expected to occur on reserve lands. In the event that a bank swallow colony does occur on the habitat reserves, the Conservancy would avoid disturbance of colonies during the nesting season. Operation and maintenance activities would not preclude or interfere with foraging by bank swallows. If use of the Natomas Basin by bank swallows appreciably increased in the future, the Conservancy would implement additional conservation measures deemed appropriate, based on applicable USFWS- or CDFG-approved bank swallow recovery or management plans, or the Adaptive Management provisions of the Proposed Action.

Overall Effects on Bank Swallow. The loss of foraging habitat for bank swallows in the Natomas Basin has the potential to result in significant impacts to species habitat conditions. The creation of managed marsh reserves under the Proposed Action, however, would ensure that available habitat remains in the Natomas Basin in perpetuity. Therefore, the overall impact would be less than significant with implementation of the HCP conservation measures in the Proposed Action, and the potential loss of active nest areas would be mitigated to a less-than-significant level with implementation of the avoidance measures under the Proposed Action.

4.4.5.2.15 Loggerhead Shrike

Effects of Changes in Habitat. In the Natomas Basin, potential foraging habitat for the loggerhead shrike primarily consists of pasture, grasslands, ponds and seasonally wet areas, croplands, orchards, and ruderal habitats. Shrikes also could nest in trees or shrubs occurring in or along the margins of these habitats. Canals, riparian areas, and oak and tree groves also provide nesting opportunities for this species. The habitat classes (from Tables 4-2 and 4-4) that would provide potential habitat for loggerhead shrike and the changes in acreage from implementing the Proposed Action are presented in Table 4-17. Based on the GIS, the Natomas Basin supports about 23,300 acres of potential habitat for loggerhead shrike.

Only a portion of the potential habitat would be used by loggerhead shrikes. This species occurs in close association with small trees and shrubs that it uses as perch sites from which foraging bouts are launched and as nest sites. Small trees and shrubs are not found in the middle of the field; rather, they occur sporadically along the margins of the fields. Telephone lines along the roads also are used as perch sites. Because loggerhead shrikes forage by making short forays from perch sites, they would not use the inner portions of fields that occur at some distance from perch sites. Thus, loggerhead shrikes predominantly would use only the margins of fields and areas where there are perch sites. Considering the entire acreage of agricultural fields as potential habitat for loggerhead shrike overestimates the amount of habitat available to this species in the Natomas Basin.

Based on the habitat and land use analysis, potential habitat for loggerhead shrike would decline by about 9,000 acres as a result of urban development (Table 4-17). Most of the potential habitat that would be lost would be nonrice crops. Nonrice crops provide relatively poor habitat for loggerhead shrike because this species feeds predominantly on insects and intensive management of agricultural lands strives to reduce insect pests. Further, insecticides are used to control insect pests and insecticide use is believed to be contributing to declines in loggerhead shrike populations (Kaufman, 1996).

TABLE 4-17
Change in Potential Habitat for Loggerhead Shrike (acres)

Habitat Class	Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition
Alfalfa	371	0	0	0	0	371
Grassland	886	(427)	0	(134)	(560)	325
Nonrice crops	16,686	(4,663)	(325)	(1,529)	(6,517)	10,169
Oak groves	98	(6)	(2)	0	(8)	89
Orchard	182	(13)	0	0	(13)	169
Pasture	674	(23)	(22)	(101)	(147)	527
Ponds and seasonally wet areas	96	(7)	(4)	(10)	(21)	75
Riparian	124	(24)	0	0	(24)	100
Ruderal	1,970	(1,137)	(6)	(88)	(1,231)	739
Rural residential	377	(46)	(10)	0	(56)	321
Tree groves	106	(10)	(23)	0	(33)	73
Canals (all)	1,778	(117)	(72)	(215)	(404)	1,374
TOTAL	**23,348**	**(6,473)**	**(464)**	**(2,077)**	**(9,014)**	**14,332**

(#) decrease in acreage
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002).

The habitat reserves would provide 2,187.5 acres of high-quality habitat for loggerhead shrike in perpetuity. This habitat would be stable in quality and location and encourage the establishment and long-term persistence of a breeding population in the Natomas Basin. Specifically to attract and maintain loggerhead shrikes, the Conservancy would encourage development and maintenance of perching and nesting sites on habitat reserves. Riparian habitat and some of the managed marsh on the reserves could provide additional nesting opportunities and foraging perch sites. The mosaic of upland, riparian, and marsh habitats on the reserves would provide nesting opportunities in close proximity to foraging habitat and provide all essential habitat features for loggerhead shrikes.

In addition to reducing habitat availability, urban development near areas inhabited by shrikes can have indirect effects. Free-ranging domestic cats are often introduced to an area by the establishment of residential areas. Residential development close to areas inhabited by shrikes could lead to increased predation by cats. Under the Proposed Action, habitat reserves would be located at least 800 feet from urban areas and areas designated for urban development in applicable plan (unless a smaller distance is approved by CDFG and USFWS on a case-by-case basis). By locating habitat reserves away from urban areas, predation by cats could be reduced although not eliminated.

Effects of Construction Activities. Construction activities associated with development or for habitat creation on the habitat reserves could disturb or displace loggerhead shrikes.

Under the Proposed Action, preconstruction surveys would be conducted for loggerhead shrikes prior to urban development. If loggerhead shrikes are found, disturbance would be avoided during the nesting season to the maximum extent possible. Construction activities adjacent to the habitat reserves could disturb shrikes nesting on the reserves. The potential for this impact is low because the habitat reserves would be located 800 feet from urban development or lands designated for urban development (unless a smaller distance is approved by CDFG and USFWS on a case-by-case basis). On the habitat reserves, the Conservancy similarly would avoid disturbance to loggerhead shrike nest sites during construction activities for habitat creation.

Effects of Water Agency and Conservancy Management. Operations and maintenance effects on loggerhead shrike are expected to be rare or infrequent. Canals and drains that would be affected by these activities generally do not support suitable habitat for loggerhead shrike.

On the habitat reserves, management activities by the Conservancy could disturb or displace loggerhead shrikes nesting on the reserve. Under the Proposed Action, the Conservancy would avoid disturbance of loggerhead shrikes during the nesting season while conducting management activities to the maximum extent practicable.

Overall Effects on Loggerhead Shrike. The net reduction in agricultural fields under the Proposed Action likely would reduce the total population of loggerhead shrikes in the Natomas Basin. Although there would be a net reduction in potential habitat for loggerhead shrike, with creation and protection of high-quality habitat on the habitat reserves under the Proposed Action and the persistence of habitat outside of the reserve system, loggerhead shrikes would continue to be supported in the Natomas Basin. The changes in habitat from planned urban development, therefore, would be mitigated by implementing the Proposed Action's conservation strategy. As a result, the population of loggerhead shrike in the Natomas Basin would not be adversely affected. Therefore, impacts to this species would be reduced to a level that is not significant.

4.4.5.3 Impacts to Other Special-status Species

This section presents the impacts to other special-status species not covered by the ITPs. These are:

- Suisun Marsh Aster (Section 4.4.5.3.1)
- Dwarf Downingia (Section 4.4.5.3.2)
- Rose Mallow (Section 4.4.5.3.3)
- Cooper's Hawk (Section 4.4.5.3.4)
- Short-eared Owl (Section 4.4.5.3.5)
- American Bittern (Section 4.4.5.3.6)
- Ferruginous Hawk (Section 4.4.5.3.7)
- Mountain Plover (Section 4.4.5.3.8)
- Black Tern (Section 4.4.5.3.9)
- Lark Sparrow (Section 4.4.5.3.10)
- White-tailed Kite (Section 4.4.5.3.11)
- Pacific Slope Flycatcher (Section 4.4.5.3.12)
- Little Willow Flycatcher (Section 4.4.5.3.13)

- American Peregrine Falcon (Section 4.4.5.3.14)
- Greater Sandhill Crane (Section 4.4.5.3.15)
- Bald Eagle (Section 4.4.5.3.16)
- Long-billed Curlew (Section 4.4.5.3.17)
- Bewick's Wren (Section 4.4.5.3.18)
- Fish Species of Special Concern (Section 4.4.5.3.19)
- Waterfowl (Section 4.4.5.3.20)

The species considered in this section are those special-status species that have a reasonable expectation of occurring in the Natomas Basin but are not covered species under the Proposed Action. Section 3.4.2 presents the process for identifying special-status species in the Natomas Basin, and Table 3-8 lists 101 species that were identified. In combination, Sections 4.4.5.2 and 4.4.5.3 address potential impacts to species that could reasonably occur in the Natomas Basin (the 22 covered species and 29 other species). For the reasons presented in Table 3-8, the 50 other identified special-status species are not likely to occur in the Natomas Basin. Generally, these species are not likely to occur either because suitable habitat is not present or because the Natomas Basin is outside of the species' known range. Therefore, impacts would be less-than-significant and the species are not addressed further in this document. If any of these species are encountered on a development site (e.g., during the required preconstruction surveys), then any applicable USFWS and/or CDFG species protection guidelines would be followed.

4.4.5.3.1 Suisun Marsh Aster

Suisun marsh aster has not been specifically addressed in prior environmental documents relating to land development in the Natomas Basin. As described in Section 3.4 of this EIR/EIS, Suisun Marsh aster is not known to occur in the Natomas Basin. The small loss of potential habitat (i.e., ponds and seasonally wet areas) from the covered activity of urban development would not substantially adversely affect this species' distribution or abundance. Thus, no impacts would occur. The species would benefit if it colonized the managed-marsh habitat created and maintained on the habitat reserves.

4.4.5.3.2 Dwarf Downingia

Dwarf downingia was addressed in the EIR for the North Natomas Community Plan, which required site-specific surveys prior to development, but was not specifically addressed in other environmental documents for land development in the Natomas Basin. In the Natomas Basin, dwarf downingia could occur in vernal pools and seasonal wetlands. Urban development could result in the loss of up to 21 acres of ponds and seasonally wet areas, and also in the loss of currently unknown vernal pool resources. The loss of this habitat could result in the loss of individual dwarf downingia plants, which is a potentially significant impact.

4.4.5.3.3 Rose Mallow

Rose mallow was addressed in the EIR for the North Natomas Community Plan, which required site-specific surveys prior to development. In addition, the EIR for the City of Sacramento General Plan Update evaluated effects to special-status plant species, including rose mallow, and concluded that impacts would not be possible to mitigate to a less-than-significant level. Specific impacts to rose mallow were not addressed in the EIR for the Sutter County General Plan.

Rose mallow could occur in the ditches and canals and in vernal pools. Urban development could result in the loss of up to 21 acres of ponds and seasonally wet areas, currently unknown vernal pool resources, and 404 acres of canals and ditches. The loss of this habitat could result in the loss of individual rose mallow plants, which is a potentially significant impact.

4.4.5.3.4 Cooper's Hawk

Cooper's hawks were addressed in the EIR for the North Natomas Community Plan, which required site-specific surveys prior to development, but were not specifically addressed in other environmental documents for land development in the Natomas Basin. Cooper's hawks typically are found in areas with trees but do not requires densely wooded areas. Foraging Cooper's hawks exploit a relatively wide variety of habitats, including residential areas. Because of their broad use of habitat for foraging, no impacts would be expected from reductions in habitat that might support foraging.

For nesting, Cooper's hawks often use small groves of trees. Up to 42 acres of oak groves, riparian lands, and tree groves could be converted as a result of implementing the covered activity of urban development. These groves constitute potential nesting habitats for Cooper's hawks. This loss of habitat, however, is not expected to have a substantial adverse effect on Cooper's hawks because of the small acreage involved and this hawk's ability and willingness to nest in residential areas. A nest tree, however, could be removed during construction, which could cause mortality of eggs or chicks. Removal of a nest tree would violate the California Fish and Game Code and mortality of chicks or destruction of eggs would violate the Fish and Game Code and the Migratory Bird Treaty Act. The potential for these effects is considered a significant impact related to urban development.

Cooper's hawks would benefit from measures to protect nesting sites for Swainson's hawks and from creation of upland and marsh habitat in the habitat reserves. Under the Proposed Action, valley oaks and other large trees and stands of riparian trees would be maintained where possible. Trees also would be integrated into the habitat reserves. The mosaic of habitats in the reserves would provide additional habitat for Cooper's hawks. Although potential benefits attributable to the Proposed Action are expected to occur, these benefits would not reduce the potential direct impact (i.e., loss of an active nest tree) to a less-than-significant level. Additional mitigation measures are proposed in Section 4.4.5.4.

4.4.5.3.5 Short-eared Owl

Short-eared owls were addressed in the EIR for the North Natomas Community Plan, which required site-specific surveys prior to development, but were not specifically addressed in other environmental documents for land development in the Natomas Basin. Short-eared owls are associated with grassland and wetland habitats. Under the Proposed Action, the total amount of open habitats in the Natomas Basin would decline. However, this species is not known to occur in the Natomas Basin in large numbers and is not likely to be limited by foraging habitat during its winter residency in the basin. Therefore, habitat loss is not expected to result in a substantial adverse effect on short-eared owls. Because short-eared owls are not known to nest in the Natomas Basin, there is no potential for the covered activities to cause direct mortality.

The habitat reserves would at least partially offset the net reduction in habitat by providing higher-quality habitat. The habitat reserves would consist of a mosaic of wetland and

upland habitats managed for wildlife habitat value. Uplands in particular would be managed to provide small mammal prey for Swainson's hawks. Short-eared owls also prey on small mammals and would benefit from the availability of foraging habitat. Furthermore, the reserves would provide high-quality foraging habitat consistently over years and in known locations.

Overall, impacts to short-eared owls would be less than significant because adverse effects would not be substantial and potential long-term benefits are anticipated to occur with implementation of the Proposed Action's habitat reserve system development.

4.4.5.3.6 American Bittern

American bitterns have not been specifically addressed in prior environmental documents relating to land development in the Natomas Basin. American bitterns are associated with wetland habitat. In the Natomas Basin they use canals and ditches; rice fields also could provide habitat. Under the Proposed Action, some canals and ditches would be converted to urban development and the total amount of rice in the basin would decline. These habitats provide relatively low-quality habitat for bitterns. Rice fields are intensively managed with low structural and biological diversity. Ditches and canals generally support only small and fragmented patches of emergent vegetation. Individual bittern nests, however, could be destroyed as a result of urban development or the management of canals and drains. Destruction of an active nest would be a violation of the Migratory Bird Treaty Act, and is a potentially significant impact.

The managed-marsh habitat created and maintained on the habitat reserves would provide high-quality habitat for American bittern. Further, large canals where the largest, most contiguous patches of wetland habitat occur would remain. Although potential benefits are expected from implementing the Proposed Action, these benefits would not reduce the potential direct impact (i.e., loss of an active nest) to a less-than-significant level. Additional mitigation measures are proposed in Section 4.4.5.4.

4.4.5.3.7 Ferruginous Hawk

Ferruginous hawks have not been specifically addressed in prior environmental documents relating to land development in the Natomas Basin. Ferruginous hawks are rare winter visitors to the Natomas Basin. For foraging, they use open grassland habitats; they do not forage in agricultural fields to a large degree. Although open grassland areas are projected to decline under the Proposed Action, this habitat loss is not expected to result in a substantial adverse effect on ferruginous hawks because of their low numbers. Because ferruginous hawks are not known to nest in the Natomas Basin, there is no potential for the covered activities to cause direct mortality.

Given their association with grasslands rather than agricultural fields, the Proposed Action would likely increase habitat availability for ferruginous hawks because some of the upland habitat in the habitat reserves would be managed as grassland habitat that could provide suitable foraging conditions for ferruginous hawks. Overall, the Proposed Action would not result in substantial adverse changes to ferruginous hawk foraging habitat, would not affect nesting habitat, and could benefit the species through improved habitat availability and quality. Therefore, impacts would be less than significant with no additional mitigation (other than the Proposed Action measures) needed.

4.4.5.3.8 Mountain Plover

Mountain plovers have not been specifically addressed in prior environmental documents relating to land development in the Natomas Basin. The Proposed Action would result in a net loss of mountain plover foraging habitat (i.e., agricultural fields) in the Natomas Basin. Mountain plovers do not occur in the Natomas Basin in large numbers; primary wintering grounds are in the San Joaquin and Imperial valleys. Given the small numbers that use the basin, it is unlikely that foraging habitat is limited for them in the area. Suitable habitat is also available and used by mountain plovers in other nearby areas (e.g., Yolo County). Therefore, no substantial adverse effects would occur to mountain plover foraging habitat. Because the species does not nest in the Natomas Basin, no direct mortality would occur.

Benefits to mountain plovers are unlikely because the species probably would not use the habitat reserves, given their preference for sparsely vegetated habitats. Overall, the Proposed Action would not result in substantial adverse changes to mountain plover foraging habitat and would not affect nesting habitat. Therefore, impacts would be less than significant with no additional mitigation (other than the Proposed Action).

4.4.5.3.9 Black Tern

Black terns have not been specifically addressed in prior environmental documents relating to land development in the Natomas Basin. The Proposed Action would not adversely affect black terns and could have beneficial effects. Black terns are generally uncommon in the Natomas Basin but are known to forage in rice fields. Potential foraging habitat for black terns in the Natomas Basin would decrease under the Proposed Action. The Natomas Basin, however, is not known as an important foraging area for this species, and other foraging areas are available nearby (e.g., the Yolo and Sutter basins). Therefore, the projected land use changes would not result in a substantial adverse affect to black tern foraging habitat.

Potentially, black terns could nest in seasonally wet areas that support marsh vegetation or in marsh vegetation supported in the canals and ditches. Urban development, management of canals and drains, or other covered activities could destroy an active nest. Destruction of an active nest would be a violation of the Migratory Bird Treaty Act, and is a potentially significant impact.

Under the Proposed Action, a native marsh ecosystem would be created on the habitat reserves. The high quality and natural marsh conditions on the habitat reserves could encourage nesting by black terns with beneficial effects to the species. Although potential benefits are expected as a result of creating reserves, the benefits would not reduce the potential direct impact (i.e., loss of an active nest) to a less-than-significant level. Additional mitigation measures are proposed in Section 4.4.5.4.

4.4.5.3.10 Lark Sparrow

Lark sparrows have not been specifically addressed in prior environmental documents relating to land development in the Natomas Basin. Lark sparrows typically inhabit brushy habitats and grasslands with scattered trees. In the Natomas Basin, they are most likely to occur in association with ditches and canals where shrubby vegetation develops. Under the Proposed Action, open space areas would be created on both the east and west sides of Fisherman's Lake. Lark sparrows are known to occur at Fisherman's Lake, preservation measures along Fisherman's Lake would contribute to maintaining this habitat for this species. Canals and ditches also would continue to support habitat for lark sparrows

because maintenance would become less intensive under the Proposed Action. Because habitat would continue to be available in the Natomas Basin, no substantial adverse effects are expected from the implementation of the Proposed Action. Individual lark sparrow nests, however, could be disrupted during their active season. This could occur as a result of urban development, management of canals and drains, or other covered activities. Destruction of an active nest would be a violation of the Migratory Bird Treaty Act, and is a potentially significant impact.

The habitat reserves also likely would provide suitable habitat for lark sparrows as trees and shrubs would be incorporated into the marsh/upland habitat mosaic. Although potential benefits are expected as a result of creating the reserves, these benefits would not reduce the potential direct impact (i.e., loss of an active nest) to a less-than-significant level. Additional mitigation measures are proposed in Section 4.4.5.4.

4.4.5.3.11 White-tailed Kite

White-tailed kites were addressed in the EIR for the North Natomas Community Plan, which required site-specific surveys prior to development. In addition, the EIR for the City of Sacramento General Plan Update evaluated effects to white-tailed kites and concluded that impacts would not be possible to mitigate to a less-than-significant level. White-tailed kites were not specifically addressed in the EIR for the Sutter County General Plan.

White-tailed kites are a common resident in the Natomas Basin. White-tailed kites have similar habitat requirements to Swainson's hawks, nesting in trees and foraging in agricultural fields. Because of the similarity in habitat requirements, effects of the Proposed Action on white-tailed kites would be similar to that described for Swainson's hawks. Projected changes in foraging habitat for white-tailed kites would occur under the Proposed Action, generally corresponding to changes to uplands (e.g., nonrice crops, grasslands) throughout the basin. Because of the extent of changes to upland land uses throughout the basin as a result of the covered activities, the loss of habitat for white-tailed kites is a potentially significant impact. Removal of an active roosting or nesting tree could cause direct mortality to this special-status (and fully protected) species. The potential for direct mortality would be a violation of the Fish and Game Code and the Migratory Bird Treaty Act, and is a potentially significant impact related to urban development.

As described above for Swainson's hawk, the net reduction in habitat for white-tailed kites would be at least partially, if not entirely, offset by the greater quality of upland habitat in the habitat reserves created under the Proposed Action. The benefits of the permanent system of upland reserves include an emphasis on native grasslands and crops that provide higher-quality foraging opportunities (e.g., alfalfa) and long-term habitat stability in terms of amount and location of habitat. Additional benefits from implementing the Proposed Action are expected in the upland areas of managed marsh and rice reserves, as described above for Swainson's hawks. For these reasons, the expected loss in foraging habitat from urban development would be offset by the creation of habitat reserves under the Proposed Action, and potential impacts would be reduced to a less-than-significant level. Impacts associated with the loss of active roosting or nesting trees, however, would remain potentially significant. Additional mitigation measures are proposed in Section 4.4.5.4.

4.4.5.3.12 Pacific-slope Flycatcher

Pacific-slope flycatchers have not been specifically addressed in prior environmental documents relating to land development in the Natomas Basin. As described in Section 3.4, Pacific-slope flycatchers are a widespread and fairly common summer resident in warm moist woodlands, including valley foothill and montane riparian, coastal and blue oak woodlands, and montane hardwood-conifer habitats. In the Natomas Basin, these habitat conditions occur at Fisherman's Lake and in isolated tree and oak groves. Under the Proposed Action, areas would be protected on both the east and west sides of Fisherman's Lake, which would contribute to maintaining this habitat for this species. Tree groves and oak groves would be protected under the Proposed Action where possible. Therefore, no substantial adverse changes in habitat for Pacific-slope flycatchers would occur. An active nest, however, could be removed during construction for urban development, management of canals and ditches, or other covered activities. Removal of an active nest could destroy eggs or kill chicks. Destruction of an active nest would be a violation of the Migratory Bird Treaty Act, and is a potentially significant impact.

The habitat reserves under the Proposed Action would support suitable habitat conditions for Pacific-slope flycatchers because trees and shrubs would be incorporated into the marsh/upland habitat mosaic. Although potential benefits are expected, these benefits would not reduce the potential direct impact (i.e., loss of an active nest tree) to a less-than-significant level. Additional mitigation measures are proposed in Section 4.4.5.4.

4.4.5.3.13 Little Willow Flycatcher

Little willow flycatchers have not been specifically addressed in prior environmental documents relating to land development in the Natomas Basin. Little willow flycatchers are rare visitors to the Natomas Basin, occasionally occurring during migration. Because of their infrequent and transient occurrence in the basin, they are unlikely to be affected by the Proposed Action. Therefore, impacts would be less than significant.

4.4.5.3.14 American Peregrine Falcon

Impacts to peregrine falcons were determined to be less than significant in the EIR for the City of Sacramento General Plan, but were not specifically addressed in other environmental documents addressing land development in the Natomas Basin. Peregrine falcons are rare winter visitors to the Natomas Basin. Peregrine falcons forage in open habitats and, therefore, could forage in most of the Natomas Basin. They are most likely, however, to focus foraging activities in rice fields and grain fields where ducks and geese congregate in the winter. Although foraging habitat is projected to decrease as a result of urban development, this habitat loss is not expected to result in a substantial adverse effect on peregrine falcons because of their low numbers. Because peregrine falcons are not known to nest in the Natomas Basin, there is no potential for the covered activities to cause direct mortality.

As described below in Section 4.4.5.3.20, waterfowl are expected to benefit because rice and marsh habitat would persist in the Natomas Basin, thereby maintaining this area as a migratory stopover and wintering area for waterfowl. Peregrine falcons are also expected to benefit. Overall, the Proposed Action would not result in substantial adverse changes to peregrine falcon foraging habitat, would not effect nesting habitat, and could benefit the species by ensuring the persistence of waterfowl habitat. Therefore, with implementation of the mitigation measures in the HCP's conservation strategy, impacts would be less than significant with no additional mitigation needed.

4.4.5.3.15 Greater Sandhill Crane

Greater sandhill cranes have not been specifically addressed in prior environmental documents relating to land development in the Natomas Basin. Urban development would result in a net loss of foraging habitat (i.e., grasslands and upland crop areas) in the Natomas Basin. Sandhill cranes are not known to winter in the Natomas Basin, with nearby historic wintering grounds including the Sacramento–San Joaquin Delta and the Cosumnes River area to the south and the Butte Sink to the north. Because the Natomas Basin is not a historic wintering ground for sandhill cranes, the loss of grasslands and upland foraging areas is not a substantial adverse effect on sandhill crane foraging habitat. Because the species does not nest in the Natomas Basin, no direct mortality would occur.

The system of permanent habitat reserves established under the Proposed Action would ensure the availability of suitable habitat for sandhill cranes in the future. The availability of this habitat could become important in the future if currently-used wintering areas elsewhere are lost. Overall, the Proposed Action would not result in substantial adverse changes to sandhill crane foraging areas, would not affect nesting habitat, and could benefit the species by ensuring future habitat availability. Therefore, with implementation of the mitigation measures in the HCP's conservation strategy, impacts would be less than significant with no additional mitigation needed.

4.4.5.3.16 Bald Eagle

The EIR for the City of Sacramento General Plan Update evaluated effects to special-status species, including bald eagles, and concluded that impacts would be less than significant. Bald eagles were not specifically addressed in other environmental documents relating to land development in the Natomas Basin. Bald eagles are rare winter visitors to the Natomas Basin, where they principally prey on waterfowl. Waterfowl would continue to be supported in the basin on flooded rice fields and in the managed marsh of the habitat reserves (see analysis below). With the continued presence of waterfowl, the low level of use of the Natomas Basin by bald eagles would be expected to continue. Therefore, with implementation of the mitigation measures in the HCP's conservation strategy, the impact would be less than significant.

4.4.5.3.17 Long-billed Curlew

Long-billed curlews were addressed in the EIR for the North Natomas Community Plan, which required site-specific surveys prior to development. In addition, the EIR for the City of Sacramento General Plan Update evaluated effects to special-status species, including long-billed curlews, and concluded that impacts would be less than significant. Long-billed curlews were not specifically addressed in the EIR for the Sutter County General Plan.

Long-billed curlews are common winter residents in the Natomas Basin where they forage in a variety of agricultural field types. The overall amount of foraging habitat for long-billed curlews in the Natomas Basin would decline under the Proposed Action. Given the availability of agricultural lands in many areas surrounding the Natomas Basin, however, and that reduction in nesting habitat is believed to be the primary cause for declines in this species, the reduction in foraging habitat in the basin is not expected to result in a substantial adverse effect to the species. Because the species does not nest in the Natomas Basin, no direct mortality would occur.

Marsh and upland habitat on the reserves would partially offset the reduction in wintering habitat and continue to support use of the basin by long-billed curlews. Overall, the Proposed Action would not result in substantial adverse changes to long-billed curlew foraging habitat, would not affect nesting habitat, and could benefit the species through improved habitat availability and quality. Therefore, with implementation of the mitigation measures in the HCP's conservation strategy, impacts would be less than significant with no additional mitigation needed.

4.4.5.3.18 Bewick's Wren

Bewick's wrens have not been specifically addressed in prior environmental documents relating to land development in the Natomas Basin. Bewick's wrens are associated with the shrubby understory of riparian habitats. In the Natomas Basin, these habitat conditions occur at Fisherman's Lake and in some of the ditches and canals. Under the Proposed Action, areas would be protected on the east and west sides of Fisherman's Lake, thereby contributing to maintaining this habitat for this species. Canals and ditches also would continue to support habitat for Bewick's wren because maintenance activities would become somewhat less intensive. Because habitat would continue to be available in the Natomas Basin, no substantial adverse effects are expected from the implementation of the Proposed Action. Individual Bewick's wren nests, however, could be destroyed. This could occur as a result of urban development, management of canals and drains, or other covered activities. Destruction of an active nest would be a violation of the Migratory Bird Treaty Act, and is a potentially significant impact. Additional mitigation measures are proposed in Section 4.4.5.4.

The habitat reserves also likely would create suitable habitat conditions for Bewick's wrens as trees and shrubs would be incorporated into the marsh/upland habitat mosaic. Although potential benefits are expected, these benefits would not reduce the potential direct impact (i.e., loss of an active nest tree) to a less-than-significant level.

4.4.5.3.19 Fish Species of Special Concern

The USFWS and CDFG have identified 11 fish species of special concern, including anadromous salmonids, as potentially occurring in the Natomas Basin (see Table 3-8 of this EIR/EIS). The Proposed Action includes the potential for the Conservancy to acquire habitat along the east levee of the Sacramento River adjacent to the Natomas Basin (defined for the HCP as the area inside the surrounding levees). The Conservancy is the only permittee with the potential to affect these levee areas (see Sections 2.1 and 2.2 for a discussion of the Proposed Action study area and the permittees' permit areas). This area is included in the HCP to facilitate the Conservancy's acquisition and preservation of Swainson's hawk habitat. The levee areas include riparian forest areas containing mature trees, and supports extensive Swainson's hawk nesting habitat (see Figure 3-5). Because of the lack of slow-moving backwater areas, fish habitat in this area is generally limited to providing a migration corridor for immigrating adult and emigrating juvenile salmonids. Conservancy actions in this area would focus on acquiring and preserving existing nesting habitat for Swainson's hawks, and actions would not include tree removal or development actions involving land disturbance that could reduce shaded riverine aquatic cover or result in discharge of sediment or construction waste into the Sacramento River. Therefore, adverse effects to fish habitat would not occur, and there would be no impact. In addition, water quality effects would be less than significant with mitigation (see Section 4.3 of this EIR/EIS), and secondary fisheries effects associated with drainage in the Natomas Basin

(i.e., through RD 1000 discharges into the Sacramento River, Steelhead Creek, and the Natomas Cross Canal) would also be less than significant.

4.4.5.3.20 Waterfowl

Rice fields currently provide most of the wintering and migratory stopover habitat for waterfowl in the Natomas Basin. Under the Proposed Action, the acreage of rice in the basin would decline by about 5,700 acres. The impact of this change on waterfowl and other water birds was considered a significant and unavoidable consequence of implementing the City of Sacramento General Plan, a conclusion that the City also reached in the EIRs for the North and South Natomas Community Plans. Waterfowl were not specifically addressed in the EIR for the Sutter County General Plan. Wintering habitat is probably not currently limiting populations in the Central Valley because of the abundance of rice fields in the North Sacramento Valley, the increased use of winter flooding in rice fields, and the increased acreage of state and federal refuges and private conservation areas for waterfowl habitat throughout the Central Valley.

Under the Proposed Action, the reduction in potential habitat would be partially offset by creation and preservation of 2,187 acres of managed marsh on the habitat reserves so that the net reduction in habitat for waterfowl would be about 3,500 acres. In addition, 4,375 acres of rice would be incorporated into the reserve system and managed using wildlife-friendly techniques, including winter flooding in most cases. Accordingly, the Proposed Action would provide long-term benefits to waterfowl by ensuring that rice and marsh habitat would persist in the Natomas Basin, thereby maintaining this area as a migratory stopover and wintering area for waterfowl. Because of the persistence of waterfowl habitat in the Natomas Basin and the availability of habitat in surrounding areas and throughout the Central Valley, the change in waterfowl habitat attributable to the Proposed Action does not represent a substantial adverse change, and the impact would be less than significant with implementation of the mitigation measures in the HCP's conservation strategy.

4.4.5.4 Mitigation Measures

Overall, no mitigation is required for potential impacts to habitat and covered species because the overall impact of the Proposed Action, including implementation of the planned conservation measures, would be less than significant.

The Proposed Action's conservation strategy for vernal pools adequately mitigates potential impacts to a less-than-significant level. Impacts to other jurisdictional wetlands, however, are not addressed by the vernal pool conservation strategy. To supplement the 404 permit process for other wetlands subject to ACOE jurisdiction, the following mitigation measure is proposed:

- As part of the process for development review, the City and Sutter County will include a provision that public or private development projects that could support jurisdictional wetlands will result in no net loss of wetlands and will ensure that the wetlands functions and values will be maintained.

With this measure, both direct (e.g., filling) and indirect (e.g., changes in hydrology) impacts to jurisdictional wetlands would be avoided or compensated and, therefore, reduced to a less-than-significant level.

The potential exists for significant impacts to occur to some of the special-status species potentially occurring in the Natomas Basin that are not addressed in the HCP. In some cases, such potential impacts could be mitigated by measures proposed in the EIRs prepared for development in the various permit areas. For example, preconstruction surveys are required pursuant to the EIR for the North Natomas Community Plan for all special-status species, but similar mitigation is not prescribed in the EIRs for the Sutter County General Plan and the South Natomas Community Plan. To consolidate these measures and help facilitate species conservation, the following mitigation measures are recommended.

- Preconstruction surveys required pursuant to Section V.A.1 of the HCP shall encompass the habitat areas that could support dwarf downingia or rose mallow. If dwarf downingia or rose mallow are found during the habitat surveys, mitigation shall conform to the mitigation requirements for Delta tule pea and Sanford's arrowhead as described in the HCP and in accordance with the California Native Plant Protection Act.
- Preconstruction surveys required pursuant to Section V.A.1 of the HCP shall encompass the habitat areas where nesting birds could occur. In accordance with the requirements of the Migratory Bird Treaty Act, vegetation containing an occupied nest and an appropriate-sized buffer around the nests of Cooper's hawks, American bitterns, black terns, lark sparrows, white-tailed kites, Pacific-slope flycatchers, and Bewick's wrens shall not be removed until the nest has been abandoned by the nesting pair or the young have fledged.

4.4.5.5 Significance After Mitigation

With the implementation of mitigation measures described in Section 4.4.1.2, all impacts to biological resources would be less than significant.

4.4.6 Alternative 1 – Increased Mitigation

Under Alternative 1, the mitigation ratio for developed land would be increased from 0.5:1 to 1:1. The development limit for the City, Sutter County, and Metro Air Park would remain at 17,500 acres, but this amount of development would result in the acquisition of 17,500 acres of mitigation land. The requirement for one contiguous block of 2,500 acres would not change, and other reserve lands would be acquired to ensure that they form 400-acre contiguous blocks. Avoidance and minimization measures for construction and management activities would be the same as under the Proposed Action.

4.4.6.1 Impacts

4.4.6.1.1 Land Use and Habitats

Under this alternative, conversion of habitat to urban uses would be the same as under the Proposed Action. Thus, the potentially significant impacts associated with changes in the amount of marsh habitat, vernal pools, and upland habitat attributed to urban development under the Proposed Action also would occur under Alternative 1. Twice as much mitigation land, however, would be incorporated into the habitat reserves under Alternative 1. A total of 17,500 acres would be acquired and protected in habitat reserves. The percent composition of the habitat reserves would be the same as under the Proposed Action (i.e., 25 percent marsh habitat, 25 percent upland habitat, and 50 percent rice). Thus, the reserves would support 4,375 acres each of marsh and upland habitat and 8,750 acres of rice. Because

the impacts attributable to the covered activities would be the same as described for the Proposed Action, the following evaluation focuses on differences in habitat and impacts to special-status species attributable to differences in the habitat reserves.

Marsh Habitat

This alternative would substantially increase the amount of marsh habitat in the Natomas Basin. Very little native marsh (less than 100 acres) currently exists in the basin. Under Alternative 1, 4,375 acres of managed marsh would be created and protected in perpetuity. As described for the Proposed Action, managed marsh provides better habitat quality than rice for wetland-dependent species. In addition, 8,750 acres of rice would be protected in perpetuity on the habitat reserves and managed for wildlife habitat values. This alternative would substantially improve habitat conditions (both amount and quality) for marsh-associated species in the Natomas Basin and would reduce impacts associated with urban development to a less-than-significant level.

Upland Habitat

Under this alternative, 4,375 acres of the reserve system would be upland habitat managed predominantly to provide foraging habitat for Swainson's hawks. As described under the Proposed Action, upland habitat on the habitat reserves would provide higher-quality habitat than the agricultural fields that would be lost to urban development. While the total amount of upland habitat in the Natomas Basin might not change substantially, this alternative would improve the quality of the available upland habitat for upland-associated species. Given the improvement in habitat quality, and long-term protection of habitat, this alternative would reduce impacts associated with urban development to a less-than-significant level.

Riparian Habitat

For the same reasons as described for the Proposed Action, no substantial change in the amount of riparian habitat would occur under Alternative 1. Therefore, impacts to riparian habitat would be less than significant.

Oak Grass

For the same reasons as described for the Proposed Action, no substantial changes to oak groves are expected under Alternative 1. Therefore, impacts to oak groves would be less than significant.

Vernal Pool Habitat

The same measures for vernal pools would be implemented under Alternative 1 as under the Proposed Action. Therefore, impacts to vernal pools under this alternative would be the same as described for the Proposed Action.

4.4.6.1.2 Species Covered Under the ITPs

Avoidance and minimization measures for construction and management activities would be the same as under the Proposed Action. Therefore, construction and management effects to covered species would be the same as described for the Proposed Action. The following analysis focuses on habitat effects to species covered under the ITPs potentially resulting from Alternative 1.

Delta Tule Pea

With creation of 4,375 acres of marsh habitat, this alternative would substantially increase the amount of habitat for Delta tule pea. If Delta tule pea colonized marsh on the habitat reserves or if the Conservancy introduced individuals to the habitat reserves, this species would benefit from an increased population size and distribution. Effects of Alternative 1 would be qualitatively the same as the Proposed Action, but with the greater amount of marsh habitat created and protected on the reserves, this alternative could provide greater benefits to the species. As under the Proposed Action, no substantial adverse effects to Delta tule pea would occur, and the impact would be less than significant.

Sanford's Arrowhead

Effects of Alternative 1 on Sanford's arrowhead would be the same as described for the Delta tule pea.

Vernal Pool Species

The same measures for vernal pools would be implemented under Alternative 1 as under the Proposed Action. Therefore, impacts to vernal pool species under this alternative would be the same as described for the Proposed Action.

California Tiger Salamander

The same measures to identify, avoid, and mitigate impacts to vernal pools and other wetland habitats would be implemented under Alternative 1 as under the Proposed Action. Therefore, impacts to California tiger salamander under this alternative generally would be the same as described for the Proposed Action (less than significant). This alternative would differ from the Proposed Action, however, in that twice as much managed marsh would be provided in the habitat reserves. California tiger salamander could benefit if the Conservancy was successful in attracting individuals to the habitat reserves or if it re-introduced the species to the habitat reserves. Impacts to this species under Alternative 1 would be less than significant.

Western Spadefoot Toad

Under Alternative 1, the same measures to identify, avoid, and mitigate impacts to vernal pools and other wetland habitats would be implemented as under the Proposed Action. Therefore, impacts to western spadefoot toad generally would be the same under this alternative as described for the Proposed Action (less than significant). Alternative 1 would differ from the Proposed Action, however, in that twice as much managed marsh would be provided in the habitat reserves. This increased amount of habitat could provide additional benefits to western spadefoot toads if individuals were attracted to the habitat reserves or if the Conservancy successfully re-introduced the species to the habitat reserves. No significant impacts to western spadefoot toad would occur under Alternative 1.

Valley Elderberry Longhorn Beetle

The same measures for valley elderberry longhorn beetles (VELB) would be implemented under Alternative 1 as under the Proposed Action. Therefore, impacts to VELB under this alternative would be generally the same as described for the Proposed Action (less than significant). Because plantings of elderberry shrubs would be included in the habitat reserves, this alternative would provide greater opportunities for increasing the amount of land for VELB, given the greater acreage in the habitat reserves relative to the Proposed Action. Actual increases in the availability of elderberry shrubs would depend on specific designs for the habitat reserves.

Giant Garter Snakes

Like the Proposed Action, urban development under this alternative would convert about 8,500 acres of habitat for giant garter snakes to urban uses. Most of the reduction in habitat would be rice, which does not provide optimal habitat for giant garters snakes. A total of 17,500 acres would be incorporated into the habitat reserve system, of which 13,125 acres would be habitat (rice or managed marsh) for giant garter snakes. The quality of habitat for giant garter snakes under Alternative 1 would increase substantially as 4,375 acres of managed marsh would be created and managed for snakes. As described for the Proposed Action, managed marsh provides higher-quality habitat than rice and is preferred by giant garter snakes. Currently, less than 100 acres of native marsh exists in the Basin. With the creation of over 4,000 acres of managed marsh, this alternative would substantially increase the amount of marsh habitat. Further, rice on the reserves would be managed to provide habitat for giant garter snakes and minimize adverse effects of rice management on snakes. The substantially greater quality of habitat that would be provided in the habitat reserves, and its long-term protection of habitat under Alternative 1, would substantially benefit giant garter snakes. Therefore, impacts to giant garter snakes under Alternative 1 would be less than significant.

Northwestern Pond Turtle

Changes in habitat for northwestern pond turtles under this alternative and the effects of those changes on this species would be qualitatively the same as described for Proposed Action (less than significant). Most of the reduction in potential habitat would consist of rice, which does not provide optimal habitat for pond turtles. The quality of habitat under Alternative 1 would increase substantially as 4,375 acres of managed marsh which provide natural habitat conditions for pond turtles would be created. Currently, less than 100 acres of native marsh exists in the Natomas Basin. Further, rice on the reserves would be managed so as to improve habitat value and minimize adverse effects of rice management on wildlife. Rice and marsh habitat on the reserves also would be protected in perpetuity. Thus, this alternative would substantially increase the availability of high-quality habitat for northwestern pond turtles and benefit this species over all. Therefore, impacts to this species under Alternative 1 would be less than significant.

White-faced Ibis

The quality of habitat for white-faced ibis under Alternative 1 would increase substantially from the creation of 4,375 acres of managed marsh. As described for the Proposed Action, marsh constitutes the natural habitat for white-faced ibis and is required for nesting. Currently, fewer than 100 acres of native marsh exists in the basin and marshes suitable for nesting are absent. With the substantial increase in marsh habitat and its long-term protection, this alternative could attract nesting birds in the future. Further, rice on the reserves would be managed so as to improve habitat value. The substantially greater quality of habitat that would be provided in the habitat reserves would benefit white-faced ibis, and impacts would be less than significant.

Tricolored Blackbird

Under Alternative 1, the amount of foraging habitat would decrease to levels similar to that expected under the Proposed Action. Effects to tricolored blackbirds from declines in potential foraging habitat would be generally the same as described for the Proposed Action (less than significant). Relative to the Proposed Action, however, under Alternative 1, a

greater amount of foraging habitat would be maintained on the habitat reserves. Therefore, declines in potential foraging habitat would be offset to a greater degree by the habitat reserves under Alternative 1 relative to the Proposed Action. As under the Proposed Action, impacts to tricolored blackbird resulting from changes in the amount of foraging habitat would be less than significant.

Alternative 1 would substantially increase the amount of nesting habitat for tricolored blackbirds from about 713 acres to nearly 5,000 acres, substantially benefiting tricolored blackbirds. Loss of marsh habitat has been the primary factor in the decline in tricolored blackbirds. Under this alternative, 4,375 acres of marsh would be created and protected in the habitat reserves. With the limited amount of marsh habitat currently in the basin, the habitat reserves would substantially increase the amount of nesting habitat available to tricolored blackbirds. One colony of tricolored blackbirds is already protected on the Conservancy's Betts-Kismat-Silva reserve. With the creation of marsh habitat, additional colonies likely would establish on the habitat reserves and contribute to increasing the size and distribution of tricolored blackbirds in California. With the benefits of managed-marsh habitat afforded to tricolored blackbirds under this alternative, impacts to this species under Alternative 1 would be less than significant.

Swainson's Hawk

Alternative 1 would have generally the same effects on nesting habitat for Swainson's hawk as the Proposed Action. With the greater acreage incorporated into the habitat reserves under this alternative, more of the oak groves, tree groves, and riparian habitat existing in the basin could be incorporated into the reserve system and more trees could be planted in the reserves to develop into nesting habitat than under the Proposed Action. Increases in the amount of nesting habitat on the reserves would depend on the degree to which trees were incorporated into the habitat design.

Foraging habitat would decline under Alternative 1 to about the same level as expected under the Proposed Action. Thus, this alternative would have similar effects on Swainson's hawks as the Proposed Action. Under this alternative, however, a greater amount of upland habitat would be incorporated into the reserves where it would be protected in perpetuity and managed to provide optimal foraging habitat condition for Swainson's hawks. Given the long-term protection and greater quality of the habitat, this alternative would further benefit Swainson's hawks relative to the Proposed Action. As described for the Proposed Action, impacts to Swainson's hawk under Alternative 1 would be less than significant.

Aleutian Canada Goose

The amount of potential habitat for Aleutian Canada geese under Alternative 1 would be similar to the Proposed Action. Therefore, effects of Alternative 1 on Aleutian Canada geese, relative to the No Action Alternative, would be qualitatively similar to that described for the Proposed Action (less than significant). Because a greater amount of habitat would be protected in the habitat reserves than under the Proposed Action, this alternative could improve habitat quality for Aleutian Canada geese and would provide greater certainty that habitat would be available in the Natomas Basin over the long term. For the same reasons as described for the Proposed Action, impacts to Aleutian Canada geese under Alternative 1 would be less than significant.

Burrowing Owl

Protection and management of upland habitat in the habitat reserves under Alternative 1 would substantially increase the amount and quality of potential habitat for burrowing owls. Under this alternative 4,375 acres of the habitat reserves would be managed for upland habitat values. Effects of Alternative 1, relative to the No Action Alternative, would be similar to that described for the Proposed Action. As for the Proposed Action, impacts to burrowing owls would be less than significant.

Bank Swallow

Under Alternative 1, potential foraging habitat for bank swallows would decrease to levels similar to that expected under the Proposed Action. Therefore, effects of Alternative 1 on bank swallows, relative to the No Action Alternative, would be generally similar to that described for the Proposed Action (less than significant). However, because a greater amount of habitat would be incorporated in the habitat reserves (including a greater amount of managed marsh) than under the Proposed Action, this alternative would provide improved habitat conditions for bank swallows and would provide greater certainty that habitat would be available in the Natomas Basin over the long term. For the same reasons as described for the Proposed Action, impacts to bank swallows under Alternative 1 would be less than significant.

Loggerhead Shrike

Habitat for loggerhead shrikes would decline to about 10,400 acres under Alternative 1. This amount of habitat would be similar to that expected under the Proposed Action and effects on loggerhead shrike would be similar (less than significant). However, twice as much upland habitat would be incorporated into the reserves. As under the Proposed Action, management of upland habitat on the reserves would include incorporating features to improve habitat quality for loggerhead shrikes. Thus, while Alternative 1 would result in a similar total acreage of habitat for loggerhead shrikes as the Proposed Action, more high-quality habitat would be created. Further, Alternative 1 would provide greater long-term certainty of the availability of habitat in the Natomas Basin compared to the No Action and the Proposed Action. Therefore, impacts to loggerhead shrikes would be less than significant.

4.4.6.1.3 Other Special-status Species

Effects of Alternative 1 on special-status species not covered by the ITPs would be qualitatively similar to that described for the Proposed Action. Because a greater amount of habitat would be incorporated into the habitat reserves (where it would be managed for wildlife habitat values) than under the Proposed Action, however, this alternative would improve habitat conditions for special-status species not covered by the ITPs and would provide greater certainty that habitat would be available in the Natomas Basin over the long term. Avoidance and minimization measures for construction and management activities would be the same as under the Proposed Action. Therefore, construction and management effects to other special-status species would be the same as described for the Proposed Action (potentially significant in some cases).

4.4.6.1.4 Waterfowl

Waterfowl would benefit from the substantial increase in marsh habitat under Alternative 1. With the long-term protection and management of marsh habitat and rice in the habitat reserves, the Natomas Basin would continue to serve as an important wintering area for waterfowl. Therefore, impacts to waterfowl under Alternative 1 would be less than significant.

4.4.6.2 Mitigation Measures

No mitigation is required for potential impacts to habitat and covered species because the overall impact of Alternative 1, including implementation of the planned conservation measures, would be less than significant. Potential impacts could occur to vernal pools and some of the special-status species potentially occurring in the Natomas Basin that are not addressed in the HCP. Mitigation is required as described in Section 4.4.5.4.

4.4.6.3 Significance After Mitigation

With the implementation of mitigation measures described in Section 4.4.5.4, all impacts to biological resources would be less than significant.

4.4.7 Alternative 2 – Habitat-based Mitigation

Under Alternative 2, the mitigation ratio to compensate for urban development impacts would be based on the habitat value of the lands to be developed. Site-specific management plans would be developed as the reserve lands are acquired, and these reserve lands would be subject to the same requirements as under the Proposed Action. For this alternative, mitigation requirements would be based on the habitat needs of the two key species, giant garter snakes and Swainson's hawks. For giant garter snakes, managed marsh and rice would be incorporated into reserves according to the ratios shown in Table 4-18. These mitigation ratios are substantially consistent with the USFWS's Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Actions, which is widely used for developing giant garter snake mitigation requirements. Swainson's hawk mitigation ratios are based on CDFG's Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California. The Staff Report recommends that Habitat Management lands be acquired, either through fee acquisition or conservation easements on farmlands, to replace foraging habitat lost to development. The mitigation ratios to determine the amount of land to be acquired varies, based on the distance from the habitat that would be lost to a Swainson's hawk nest. Avoidance and minimization measures for construction and management activities would be the same as under the Proposed Action.

TABLE 4-18
Mitigation Ratios Under Alternative 2

Species/Habitat	Ratio
Giant garter snake	
Rice	1:1
Canals and ditches	3:1
Swainson's Hawk	
Within 1 mile of nest	1:1
Within 1 to 5 miles of nest	0.75:1
Within 5 to 10 miles of nest	0.5:1

4.4.7.1 Impacts

4.4.7.1.1 Land Use and Habitats

Under this alternative, conversion of habitat to urban uses would be the same as under the Proposed Action. Thus, the potentially significant impacts associated with changes in the amount of marsh habitat, vernal pools, and upland habitat attributed to urban development under the Proposed Action also would be applicable to Alternative 2. Because the impacts attributable to urban development would be the same as described for the Proposed Action, the following evaluation focuses on difference in habitat and impacts to special-status species attributable to differences in the habitat reserves.

About twice as much land would be incorporated into the habitat reserves under this alternative compared with the Proposed Action. The area that would be developed contains about 8,475 acres of rice, 404 acres of secondary canal, and 4,746 acres within one mile of a Swainson's hawk nest, excluding rice fields that would be subject to the giant garter snake mitigation requirements. The remainder of the development area is within 5 miles of a Swainson's hawk nest and totals 4,438 acres, not including rice fields subject to the giant garter snake mitigation requirements. Based on the mitigation ratios shown in Table 4-18, a total of 17,763 acres would be acquired and protected in habitat reserves. Of this acreage, 9,687 acres would be managed marsh and rice and 8,074 acres would be upland habitat that provides foraging habitat for Swainson's hawks.

The total amount of land incorporated into the reserves (17,763 acres) under this alternative would be nearly the same as Alternative 1, under which 17,500 acres would be incorporated into the reserve system. Much of the basin would either be developed or incorporated into the habitat reserves under Alternative 1. This situation also would occur under Alternative 2.

Marsh Habitat

This alternative would substantially increase the amount of marsh habitat in the Natomas Basin. Very little native marsh (less than 100 acres) currently exists in the Natomas Basin. Under Alternative 2, over 9,000 acres of managed marsh and rice would be created and protected in perpetuity. As described for the Proposed Action, managed marsh provides better habitat quality than rice for wetland-dependent species. This alternative would substantially improve habitat conditions (both amount and quality) for marsh-associated species in the Natomas Basin. Impacts resulting from changes in marsh habitat would be less than significant.

Upland Habitat

Under this alternative, 8,074 acres of the reserve system would be upland habitat managed predominantly to provide foraging habitat for Swainson's hawks. As described under the Proposed Action, upland habitat on the habitat reserves would provide higher-quality habitat than the agricultural fields that would be lost to urban development. While the total amount of upland habitat in the Natomas Basin might not change substantially, this alternative would substantially improve the quality of the available upland habitat for upland-associated species. Given the improvement in habitat quality, impacts from changes in upland habitat would be less than significant.

Riparian Habitat

For the same reasons as described for the Proposed Action, no substantial change in the amount of riparian habitat would occur under Alternative 2. Therefore, impacts to riparian habitat would be less than significant.

Oak Groves

For the same reasons as described for the Proposed Action, no substantial changes to oak groves are expected under Alternative 2. Therefore, impacts to oak groves would be less than significant.

Vernal Pool Habitat

The same measures for vernal pools would be implemented under Alternative 2 as under the Proposed Action. Therefore, impacts to vernal pools under this alternative would be the same as described for the Proposed Action.

4.4.7.1.2 Species Covered Under the ITPs

Avoidance and minimization measures for construction and management activities would be the same as under the Proposed Action. Therefore, construction and management effects to covered species would be the same as described for the Proposed Action. Changes in the total amount of habitat in the Natomas Basin for covered species would be generally similar to Alternative 1. As such, effects to covered species under this alternative would be the same as described for Alternative 1. The primary differences between this alternative and Alternative 1 is that a greater amount of upland habitat would be incorporated into the reserve system under Alternative 2, thereby providing improved habitat quality and long-term certainty of the availability of upland habitat relative to Alternative 1. For the same reasons described for Alternative 1, this alternative would reduce impacts attributable to urban development to a less-than-significant level.

4.4.7.1.3 Other Special-status Species

Special-status species not covered by the ITPs would benefit from the creation and protection of a substantial amount of marsh habitat and management and protection of upland habitat for wildlife values. Avoidance and minimization measures for construction and management activities would be the same as under the Proposed Action. Therefore, construction and management effects to other special-status species would be the same as described for the Proposed Action (potentially significant in some cases).

4.4.7.1.4 Waterfowl

Waterfowl would benefit from the substantial increase in marsh habitat under this Alternative 2. With the long-term protection and management of marsh habitat in the habitat reserves, the Natomas Basin would continue to serve as an important wintering and migratory stopover area for waterfowl.

4.4.7.2 Mitigation Measures

No mitigation is required for potential impacts to habitat and covered species because the overall impact of Alternative 2, including implementation of the planned conservation measures, would be less than significant. Potential impacts could occur to vernal pools and some of the special-status species potentially occurring in the Natomas Basin that are not addressed in the HCP. Mitigation is required as described in Section 4.4.5.4.

4.4.7.3 Significance After Mitigation

With the implementation of mitigation measures described in Section 4.4.5.4, all impacts to biological resources would be less than significant.

4.4.8 Alternative 3. Reserve Zone Alternative

Alternative 3 identifies specific reserve zones that would be emphasized in reserve acquisition efforts. These reserve zones would be outside the North and South Natomas Community Plan areas, and outside of Sutter County's Industrial-Commercial Reserve. Land acquisition would occur based on a 0.5:1 mitigation ratio as under the Proposed Action. Alternative 3 differs from the Proposed Action, however, in that reserve acquisition would focus on five overlapping zones that are distributed throughout the Natomas Basin based on the habitat needs of giant garter snakes and Swainson's hawks, rather than on the Proposed Action's broad requirement to mitigate generally within the basin.

The Proposed Action requires that the individual reserves be at least 400 acres in size, and that one reserve block be at least 2,500 acres in size. The five zones would allow for the minimum reserve sizes to be met as follows.

- Swainson's Hawk Zone: two 400-acre blocks
- Eastern Portion of the Natomas Basin: one 400-acre block
- Fisherman's Lake Area: two 400-acre blocks
- "Snake Alley": four 400-acre blocks
- Northwestern Portion of the Natomas Basin: one 2,500-acre block and one 400-acre block

Any remaining mitigation acreage could be located within these five zones or elsewhere in the Natomas Basin.

4.4.8.1 Impacts

4.4.8.1.1 Land Use and Habitats

Considering the basin as a whole, this alternative would have the same effects on land use and habitats as the Proposed Action. Under this alternative, land acquisition would occur based on a 0.5:1 mitigation ratio as under the Proposed Action. However, acquisition of lands to incorporate into the reserve system would be focused in five areas selected on the basis of the habitat needs and current distribution of giant garter snakes and Swainson's hawks. The total amount of marsh habitat, upland habitat, and rice in the reserves would be the same as under the Proposed Action. Effects of this alternative on marsh habitat and upland habitat would be the same as described for the Proposed Action (less than significant). The amount of riparian habitat and oak groves would not change substantially under Alternative 3 for the same reasons as described for the Proposed Action. The same measures for vernal pools would be implemented under Alternative 3 as under the Proposed Action. Therefore, impacts to vernal pools under this alternative would be the same as described for the Proposed Action (potentially significant in some cases).

4.4.8.1.2 Species Covered Under the ITPs

Future habitat conditions in the Natomas Basin under Alternative 3 would be the same as under the Proposed Action. Therefore, effects to covered species from changes in habitat would be the same as described for the Proposed Action (less than significant). Avoidance and minimization measures for construction and management activities would be the same

as under the Proposed Action. Therefore, construction and management effects to covered species would be the same as described for the Proposed Action. (less than significant)

4.4.8.1.3 Other Special-status Species

Future habitat conditions in the Natomas Basin under Alternative 3 would be the same as under the Proposed Action. Therefore, effects to other special-status species from changes in habitat would be the same as described for the Proposed Action (less than significant). Avoidance and minimization measures for construction and management activities would be the same as under the Proposed Action. Therefore, construction and management effects to other special-status species would be the same as described for the Proposed Action (potentially significant in some cases).

4.4.8.1.4 Waterfowl

Future habitat conditions in the Natomas Basin under Alternative 3 would be the same as under the Proposed Action. Therefore, effects to waterfowl would be the same as described for the Proposed Action (less than significant).

4.4.8.2 Mitigation Measures

No mitigation is required for potential impacts to habitat and covered species because the overall impact of Alternative 3, including implementation of the planned conservation measures, would be less than significant. Potential impacts could occur to vernal pools and some of the special-status species potentially occurring in the Natomas Basin that are not addressed in the HCP. Mitigation is required as described in Section 4.4.5.4.

4.4.8.3 Significance After Mitigation

With the implementation of mitigation measures described in Section 4.4.5.4, all impacts to biological resources would be less than significant.

4.4.9 Alternative 4. Reduced Development

For Alternative 4, developable lands have been reduced by 5,500 acres. Development of 12,000 acres under Alternative 4 (5,197 acres in the City of Sacramento, 4,820 acres in Sutter County, and 1,983 acres for Metro Air Park) would result in the acquisition of 6,000 acres of habitat reserves, at 0.5:1 mitigation ratio. Acquisition criteria, management, oversight, and other aspects of the planned habitat reserve system would remain the same as described in the HCP.

4.4.9.1 Impacts

4.4.9.1.1 Land Use and Habitats

Under this alternative, 12,000 acres would be converted to urban uses. Although urban development under this alternative would result in less habitat loss than the Proposed Action, potentially significant impacts from changes in the amount of marsh habitat, vernal pools, and upland habitat caused by urban development under the Proposed Action also would be applicable to Alternative 4. With 12,000 acres of urban development, 6,000 acres would be incorporated into the habitat reserves. The percent composition of habitat reserves would be the same as under the Proposed Action (i.e., 25 percent marsh habitat, 25 percent upland habitat, and 50 percent rice). Thus, the reserves would support 1,500 acres each of managed marsh and upland habitat and 3,000 acres of rice. Lands not converted to urban uses or incorporated into the habitat reserves would remain predominantly in agriculture.

Baseline and future land uses are shown in Table 4-19. The primary differences between this alternative and the Proposed Action would be that a greater amount of habitat (principally rice and nonrice crops) would not be subject to authorized development, and a smaller amount of land would be incorporated into the habitat reserve system. Considering the Natomas Basin as a whole and assuming that no development occurs other than the 12,000 acres of authorized development under this alternative, Alternative 4 would provide about 5,000 acres more habitat consisting of rice and row crops than the Proposed Action (see Tables 4-2 and 4-19). The amount of habitat protected in perpetuity in the reserves, however, would be about 2,750 acres less than under the Proposed Action.

TABLE 4-19
Land Use Acreage in the Natomas Basin under Baseline and Future Conditions Under Alternative 4 (acres)

Habitat Class	HCP Baseline	City of Sacramento	Metro Air Park	Sutter County	Total Change	Future Condition[a]
Airport	1,561	(11)	0	(13)	(25)	1,536
Alfalfa	372	0	0	0	0	372
Canals	493	0	0	0	0	493
Grassland	868	(288)	0	(86)	(374)	494
Highways	1,206	0	0	0	0	1,206
Idle	1,440	(437)	(50)	(5)	(489)	952
Nonrice crops	16,571	(2,997)	(325)	(982)	(4,304)	12,267
Oak groves	98	(4)	(2)	0	(6)	92
Orchard	181	(8)	0	0	(8)	173
Other	476	(20)	0	0	(20)	456
Pasture	682	(16)	(22)	(65)	(103)	579
Ponds and seasonally wet areas	97	(5)	(4)	(6)	(15)	82
Rice	22,979	(628)	(1,541)	(3,583)	(5,752)	17,227
Riparian	123	(16)	0	0	(16)	108
Ruderal	1,940	(730)	(6)	(57)	(793)	1,147
Rural residential	319	(33)	(10)	(22)	(66)	253
Tree groves	107	(7)	(23)	0	(30)	78
Urban	4,024	5,197	1,983	4,820	12,000	16,025
TOTAL	**53,537**	**0**	**0**	**0**	**0**	**53,537**

[a] Does not include the effects associated with the creation of habitat reserves.
Source: Habitat and Land Use Assessment Database (CH2M HILL, 2002)

Marsh Habitat

Under this alternative, 1,500 acres of managed marsh would be created and protected on the habitat reserves. As explained for the Proposed Action, the managed marsh on the habitat reserves would provide higher habitat quality than the rice that would be lost to urban development. Rice in the habitat reserves and remaining in the Natomas Basin outside of development areas and habitat reserves also would provide habitat for marsh-associated

wildlife, and impacts resulting from changes in marsh habitat would be less than significant.

Upland Habitat

The habitat reserves would contain 1,500 acres of upland habitat managed predominantly to support foraging by Swainson's hawks. As explained for the Proposed Action, upland habitat on the reserves would provide higher-quality habitat than that lost to urban development. Agricultural fields, pastures, and grasslands outside of development areas and the habitat reserves would continue to provide habitat for upland-associated wildlife. Creation and management of upland habitat on the reserves would reduce the impact resulting from reduced upland habitat (i.e., alfalfa, grassland, idle, nonrice crops, pasture, and ruderal) to a less-than-significant level.

Riparian Habitat

For the same reasons as described for the Proposed Action, no substantial change in the amount of riparian habitat would occur under Alternative 4. Therefore, impacts to riparian habitat would be less than significant.

Oak Groves

For the same reasons as described above for the Proposal Action, no substantial change in oak groves is expected under Alternative 4. Therefore, impacts to oak groves would be less than significant.

Vernal Pool Habitat

The same measures for vernal pools would be implemented under Alternative 4 as under the Proposed Action. Therefore, impacts to vernal pools under this alternative would be the same as described for the Proposed Action.

4.4.9.1.2 Species Covered Under the ITPs

Future habitat conditions in the Natomas Basin under Alternative 4 would be generally similar to those projected under the Proposed Action and, therefore, effects to covered species from changes in habitat would be the same as described for the Proposed Action. Avoidance and minimization measures for construction and management activities would be the same as under the Proposed Action. Therefore, construction and management effects to covered species would be the same as described for the Proposed Action (less than significant).

4.4.9.1.3 Other Special-status Species

Future habitat conditions in the Natomas Basin under Alternative 4 would be similar to the Proposed Action and, therefore, effects to other special-status species from changes in habitat would be the same as described for the Proposed Action. Avoidance and minimization measures for construction and management activities would be the same as under the Proposed Action. Therefore, construction and management effects to other special-status species would be the same as described for the Proposed Action (potentially significant in some cases).

4.4.9.1.4 Waterfowl

Future habitat conditions in the Natomas Basin under Alternative 4 would be similar to the Proposed Action. Therefore, effects to waterfowl would be the same as described for the Proposed Action (less than significant).

4.4.9.2 Mitigation Measures

No mitigation is required for potential impacts to habitat and covered species because the overall impact of Alternative 4, including implementation of the planned conservation measures, would be less than significant. Potential impacts could occur to vernal pools and some of the special-status species potentially occurring in the Natomas Basin that are not addressed in the HCP. Mitigation is required as described in Section 4.4.5.4.

4.4.9.3 Significance After Mitigation

With the implementation of mitigation measures described in Section 4.4.5.4, all impacts to biological resources would be less than significant.

4.4.10 Alternative 5. No Action Alternative

4.4.10.1 Impacts

Under the No Action Alternative, no incidental take authorization would be issued to the City, Sutter County, the Conservancy, RD 1000, or Natomas Mutual by the USFWS and CDFG, and no comprehensive HCP would be implemented. In the absence of a comprehensive habitat conservation planning program, the needs of listed species would be addressed on a project-by-project basis.

4.4.10.1.1 Land Use and Habitats

Urban development would still be expected to occur in the City, Sutter County, and at Metro Air Park under the No Action Alternative. If a federal action is not triggered, individual developers could seek Section 10 ITPs on a project-by-project basis, and habitat mitigation would be identified and implemented on a project-specific basis. Mitigation ratios similar to those under Alternative 2 probably would be used to identify appropriate mitigation. Thus, the composition and amount of habitat created and protected under the No Action Alternative would be expected to be similar to Alternative 2 for the same level of development. However, whereas most of the habitat created and protected under Alternative 2 would be in the Natomas Basin, the location of habitat mitigation under the No Action Alternative would not be similarly constrained. As such, there would be no guarantee regarding the amount of habitat that would remain in the Natomas Basin, and the coordinated conservation strategy of the Proposed Action would not be realized. Furthermore, because mitigation would be conducted on a project-by-project basis, mitigation sites could be small and fragmented and therefore the benefits of the large, contiguous blocks that would be created under the Proposed Action would not be realized. The implementation of habitat mitigation under the No Action Alternative also would potentially occur at unknown future dates, thus delaying creation of habitat reserves and implementation of other HCP measures (or not occurring at all). In Sutter County, the General Plan would not be amended to retain lands within the Swainson's Hawk Zone in agriculture and these lands could be developed.

4.4.10.1.2 Species Covered Under the ITPs

Under the No Action Alternative, avoidance and mitigation measures for specific species would be implemented on project–specific basis. Take of state- or federally-listed species would need to be authorized by the CDFG and/or USFWS if a proposed development would result in the take of listed species. As described above under Land Use and Habitats,

habitats for listed species would be mitigated on a project-specific basis. Avoidance measures and habitat enhancements included in the Proposed Action for unlisted species would not be implemented.

4.4.10.1.3 Other Special-status Species

Some species that are state-listed or federally-listed, but not proposed for coverage in the ITPs, could be adversely affected by urban development. Mitigation measures would be implemented for these species on a case-by-case basis. Special-status species not proposed for coverage would respond to habitat changes resulting from urban development and associated habitat mitigation.

4.4.10.1.4 Waterfowl

Rice fields should continue to be abundant in the Natomas Basin and would continue to support wintering waterfowl. If marsh habitat is created as mitigation for giant garter snakes, waterfowl would also use this habitat.

4.4.11 Independent Implementation

In implementing the HCP, the City of Sacramento, Sutter County, and the Conservancy each would receive an ITP from the USFWS and CDFG (see Chapter 1: Purpose and Need/Objectives, and Chapter 2: Proposed Action and Alternatives). Although RD 1000 and Natomas Mutual are not filing applications or seeking ITPs at this time, their participation/non participation is evaluated in this section because they may seek permits at a future date.

The preceding analysis of the Proposed Action considered the effects with participation in the HCP and receipt of ITPs by all these permit applicants. Each of these applicants, however, could independently implement the HCP. This section discloses the effects on biological resources if these entities independently implemented the HCP or if some but not all of the permittees participated.

Overall, the HCP contains mechanisms to assess incrementally the effects of implementing the HCP conservation measures. The two mechanisms are: (1) an overall program review that would be conducted when urban development of 9,000 acres has been reached, and (2) an independent midpoint review that applies only to the land-use agencies. The intent of these reviews is to recognize that uncertainties exist in the HCP plan implementation, including levels of development, program adaptations related to the future giant garter snake recovery plan, possible development of a Swainson's hawk recovery plan, and the ultimate location of the habitat reserves. Although the adaptive management program of the CP is designed to address many of these uncertainties, the overall and midpoint review programs are intended to supplement these other HCP provisions. These review mechanisms are described briefly below and in detail in Sections VI.I and VI.J of the HCP.

- **Overall program review**: This would be conducted after 9,000 acres of urban development have occurred. During that review, an additional 3,000 acres (but not more than 12,000 acres) could be developed. Issues that would be evaluated include: (1) the status and population trends of the giant garter snake, Swainson's hawk, and other covered species; (2) status and effectiveness of the habitat reserve system, including its buffer and setback requirements; (3) the success of the HCP in meeting the 2,500- and 400-acre minimum habitat block size requirements; (4) the status and effectiveness of the

HCP funding mechanisms; (5) the relative status and distribution of developed lands and reserve lands within each of the land-use agencies' jurisdictions; (6) the success of the 25 percent managed marsh/50 percent rice ratio for supporting giant garter snakes; and (7) compliance of the water agencies with approved canal and ditch maintenance practices.

- **Independent midpoint review for land use agencies**: In addition to the overall review, both the City and Sutter County would conduct a midpoint review to provide additional assurances that the HCP's objectives are being achieved, in the event that development occurs more rapidly than projected or if one of the land-use agencies discontinues participation in the HCP.

Overall, these two review mechanisms address the contingency of independent implementation of the HCP by individual permittees. The remainder of this analysis provides specific detail on the impacts to biological resources if the permittees independently implement the HCP (and in the absence of the midpoint reviews).

4.4.11.1 Land Use and Habitats

The primary conservation strategy of the Proposed Action is creating and protecting habitat reserves at a 0.5:1 ratio of acres protected in the habitat reserves for every acre developed (see Section 2.3 for a discussion of the covered activities). Creation and management of habitat reserves would remain the primary conservation strategy if either the City of Sacramento or Sutter County independently implemented the Proposed Action. The total acreage acquired, however, would be reduced to reflect the level of urban development within the participating agency's jurisdiction. Under the Proposed Action, the habitat reserves are to consist of 25 percent managed marsh, 50 percent rice and 25 percent upland habitat. If only the City of Sacramento or Sutter County implemented the Proposed Action, it would be considered a changed circumstance under the HCP. For this changed circumstance, the HCP allows for an assessment of the percent habitat composition and an adjustment in consideration of the habitats affected by urban development in the participating jurisdiction. If only the water agencies implemented the Proposed Action, no habitat reserves would be created.

As an entity responsible for implementing the HCP, the Conservancy also would hold an ITP. The ITP would authorize any take of covered species that occurs as a result of management activities by the Conservancy on the habitat reserves. The Conservancy exists because of and is financially supported by actions taken by the City of Sacramento and Sutter County. In the event that these agencies did not participate in implementation of the HCP, the Conservancy would continue to manage the habitat reserves that have been acquired to date for the benefit of species covered by the ITPs. No additional reserve lands would be acquired. The successful implementation of the HCP depends on participation of a plan operator. If the Conservancy did not participate, the permittees would select a new plan operator to continue to acquire and manage habitat reserve lands.

4.4.11.1.1 Marsh Habitat

City of Sacramento. If only the City of Sacramento implemented the Proposed Action, 8,050 acres in the Natomas Basin would be converted from existing uses to urban development. This development would affect 1,097 acres of rice, ponds and seasonally wet areas, and canals. As described under the Proposed Action, 50 percent of the reserve lands would be managed as rice and 25 percent would be managed as marsh. This would result in

3,019 acres of the habitat reserves providing habitat for marsh-associated species. This is approximately three times the acreage that would be converted to urban uses. Managed marsh would be created on about 1,000 acres. Managed marsh would provide higher-quality habitat than the approximately 1,000 acres of rice that would be lost to urban development.

Independent implementation by the City of Sacramento, however, would constitute a changed circumstance under the HCP. In this case, the HCP allows for the percent habitat composition of the reserves to be adjusted to reflect more accurately the habitat that would be affected (see the introduction to Section 4.4.11 for a discussion of the overall and midpoint review programs and the ability of the City to use these two review mechanisms to address the contingency of independent implementation of the HCP). Because a relatively greater amount of upland habitat would be affected by urban development in the City of Sacramento, the habitat reserves could contain a higher percentage of upland habitat. Given the relatively small amount of marsh habitat (about 1,000 acres) that would be affected, the City could increase the amount of upland habitat in the reserves and still mitigate impacts associated with reduced marsh habitat to a level that is less than significant.

Sutter County. If only Sutter County implemented the Proposed Action, 7,467 acres would be developed, which would affect 5,802 acres of marsh habitat (i.e., rice, ponds and seasonally wet areas, and canals). As described under the Proposed Action, 50 percent of the reserve lands would be managed as rice and 25 percent would be managed as marsh. This would result in 2,800 acres of the habitat reserves providing habitat for marsh-associated species, which is about one-half the amount that would be converted to urban uses. The managed marsh and rice on the habitat reserves would provide higher-quality habitat than the rice that would be lost to urban development.

Comparable to the City, independent implementation by Sutter County would constitute a changed circumstance under the HCP, and the Proposed Action allows for the percent habitat composition of the reserves to be adjusted to reflect more accurately the habitat that would be affected (see the introduction to Section 4.4.11 for a discussion of the overall and midpoint review programs and the ability of Sutter County to use these two review mechanisms to address the contingency of independent implementation of the HCP).

Water Agencies. If only the water agencies implemented the HCP, no habitat reserves would be acquired and protected in perpetuity. Changes in marsh habitat from urban development would be same as under the No Action Alternative. The water agencies would implement measures to avoid and minimize the effects of their maintenance activities on giant garter snakes (e.g., reduced management intensity) which could increase the value of canals and ditches to marsh-associated wildlife.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the existing acquired habitat reserves for the benefit of covered species. Effects to marsh habitat from actions taken by the City of Sacramento, Sutter County, and the water agencies would be the same as described for the No Action Alternative.

4.4.11.1.2 Upland Habitat

City of Sacramento. Under the Proposed Action, 8,050 acres would be developed in the City of Sacramento. This development would affect 6,917 acres of upland habitat. The habitat

reserve system would consist of 4,025 acres. Under the Proposed Action, the habitat reserves are to consist of 25 percent managed marsh, 25 percent upland habitat, and 50 percent rice. With 25 percent of the habitat reserves, 1,006 acres in the habitat reserves specifically would be upland habitat. If only the City of Sacramento implemented the Proposed Action, however, this would be considered a changed circumstance and the percentage composition of the habitat reserves could be adjusted in response to the specific habitats affected by the participating jurisdiction. Thus, the amount of upland habitat could be increased to match more closely the anticipated reduction in upland habitat (see the introduction to Section 4.4.11 for a discussion of the overall and midpoint review programs and the ability of the City to use these two review mechanisms to address the contingency of independent implementation of the HCP).

Sutter County. If only Sutter County implemented the Proposed Action, 7,467 acres would be developed, which would affect 1,860 acres of upland habitat. With 25 percent of the habitat reserves as upland habitat, 933 acres in the reserves would be upland habitat. This acreage is about one-half the total amount of upland habitat that would be converted to urban uses. This acreage would be provided within the reserve lands. Because of the small net loss of upland habitat, no substantial adverse effects to species associated with upland habitat would be expected.

Comparable to the City, independent implementation by Sutter County would constitute a changed circumstance under the HCP, and the Proposed Action allows for the percent habitat composition of the reserves to be adjusted to reflect more accurately the habitat that would be affected (see the introduction to Section 4.4.11 for a discussion of the overall and midpoint review programs and the ability of Sutter County to use these two review mechanisms to address the contingency of independent implementation of the HCP).

Water Agencies. If only the water agencies implemented the Proposed Action, no habitat reserves would be acquired and protected in perpetuity. Changes in upland habitat from urban development would be same as under the No Action Alternative. Management activities by the water agencies would not affect upland habitat.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the existing acquired habitat reserves for the benefit of covered species. Effects to upland habitat from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.1.3 Riparian Habitat

City of Sacramento. No adverse effects to riparian habitat would occur if only the City implemented the Proposed Action, because riparian habitat that would be affected by urban development occurs only in a small area of land adjacent to the I-5 off ramp to Del Paso Road. Other riparian habitat near Fisherman's Lake would be protected because an agricultural buffer is planned along the eastern boundary of Fisherman's Lake.

Sutter County. If only Sutter County implemented the Proposed Action, no adverse effects to riparian habitat would occur. As described for the Proposed Action, urban development within the City of Sacramento would have a minimal effect on riparian habitat. Continued management activities by the water agencies would not affect riparian habitat. The amount

of riparian habitat in the Natomas Basin could be increased through management of the habitat reserves.

Water Agencies. If only the water agencies implemented the Proposed Action, no substantial change in riparian habitat would occur. As described for the Proposed Action, no substantial change in riparian habitat in the Natomas Basin would occur from urban development in the City of Sacramento or Sutter County or continued activities by the water agencies. If only the water agencies participated (i.e., the land use agencies did not participate), the expected benefits to riparian habitat would not occur relative to the Proposed Action increase because habitat reserves would not be established nor would a tree-planting program be implemented.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the existing acquired habitat reserves for the benefit of covered species. Riparian habitat would be expected to increase as management of the habitat reserves includes planting of riparian trees.

4.4.11.1.4 Oak Groves

City of Sacramento. Impacts to oak groves could occur if only the City implemented the Proposed Action, but it is expected that removal of oak groves would be prohibited as a condition of site-specific development review in accordance with City and Sacramento County Tree Ordinance requirements.

Sutter County. If only Sutter County implemented the Proposed Action, impacts would be the same as described above for the City because of City and Sacramento County Tree Ordinance requirements, and because no oak groves are located in Sutter County's permit area.

Water Agencies. If only the water agencies implemented the Proposed Action, impacts would be the same as described above for the City because of the City and Sacramento County Tree Ordinance requirements, and because no oak groves are located in Sutter County's permit area.

Natomas Basin Conservancy. If only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the existing acquired habitat reserves for the benefit of covered species. Oak tree planting is expected to occur on the habitat reserves, and therefore oak groves would be expected to increase.

4.4.11.1.5 Vernal Pool Habitat

City of Sacramento. Effects to vernal pools with implementation of the Proposed Action by the City of Sacramento would be the same as with participation by all permittees. Prior to issuance of development permits, areas proposed for development would be surveyed. If vernal pools or covered vernal pool species were identified, avoidance and mitigation measures would be implemented in the same manner as with participation by all applicants (i.e., Sutter County, Conservancy, water agencies).

Implementation by the City of Sacramento only would not result in protection to vernal pools in Sutter County. If urban development by Sutter County would affect vernal pools that are jurisdictional wetlands, developers would need to obtain a permit from the ACOE. Through this process, avoidance, minimization, and mitigation measures could be required.

Sutter County. Effects to vernal pools with implementation of the Proposed Action by Sutter County would be the same as with participation by all permittees. Prior to issuance of development permits, areas proposed for development would be surveyed. If vernal pools or covered vernal pool species were identified, avoidance and mitigation measures would be implemented in the same manner as with participation by all applicants.

Implementation by Sutter County only would not provide any protection to vernal pools in the City of Sacramento, which could be affected by urban development. If urban development by the City of Sacramento would affect vernal pools that are jurisdictional wetlands, developers would need to obtain a permit from the ACOE. Through this process, avoidance, minimization, and mitigation measures could be required.

Water Agencies. If only the water agencies implemented the Proposed Action, the requirements for vernal pools related to urban development would not be implemented under the Proposed Action. Current regulatory requirements consist of conducting preconstruction surveys, obtaining ACOE permits if jurisdictional wetlands are involved, conducting Section 7 consultation with the USFWS if ACOE permitting is required, and implementing avoidance, minimization, and mitigation measures. This permitting process would continue even if only the water agencies implemented the Proposed Action. If a vernal pool that was not jurisdictional would be affected by urban development, no protections for these resources would be afforded if only the water agencies implemented the Proposed Action.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the existing acquired habitat reserves for the benefit of covered species. If vernal pools occurred on the habitat reserves, the Conservancy would maintain and protect these resources. If urban development in the City of Sacramento or Sutter County would affect vernal pools that are jurisdictional wetlands, developers would need to obtain a permit from the ACOE. Through this process, avoidance, minimization, and mitigation measures could be required.

4.4.11.2 Species Covered Under the ITPs

The following discussion evaluates the effects on each of the covered species with independent implementation by the City of Sacramento, Sutter County, RD 1000 and Natomas Mutual, and the Conservancy. Unless otherwise stated, the habitat composition of the reserves is assumed to be 25 percent managed marsh, 50 percent rice, and 25 percent upland habitat.

4.4.11.2.1 Delta Tule Pea

City of Sacramento. If only the City of Sacramento implemented the Proposed Action, 8,050 acres would be developed. This development would affect 7 acres of ponds and seasonally wet areas, and 117 acres of canals and ditches for a total of 124 acres of affected potential habitat for Delta tule pea. On the habitat reserves, 1,006 acres of managed marsh would be created, which would provide potential habitat for Delta tule pea. This acreage would more than offset the 124 acres of potential habitat predicted to be affected by urban development in the City of Sacramento.

Sutter County. Development in Sutter County would affect 10 acres of ponds and seasonally wet areas and 215 acres of canals and ditches for a total impact to potential Delta tule pea of 225 acres. With total urban development of 7,467 acres, 3,733 acres would be incorporated

into a habitat reserve system. The reserve system would support about 933 acres of managed marsh, which would provide potential habitat for Delta tule pea. This acreage would more than offset the 225 acres of potential habitat predicted to be affected by urban development in Sutter County.

Water Agencies. Independent implementation of the Proposed Action by RD 1000 and Natomas Mutual would not be expected to affect Delta tule pea because this species' known distribution does not include the Natomas Basin and it is not known to inhabit the basin. If the species colonized canals or ditches in the future, management activities conducted by RD 1000 and Natomas Mutual could affect individuals. No additional permanent habitat reserves with restored marsh habitat would be created that would provide potential habitat for Delta tule pea. In addition, no attempts to introduce Delta tule pea would be made.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the existing acquired habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.2 Sanford's Arrowhead

City of Sacramento. If only the City of Sacramento implemented the Proposed Action, 8,050 acres would be developed. This development would affect 7 acres of ponds and seasonally wet areas, and 117 acres of canals and ditches for a total of 124 acres of potential affected habitat for Sanford's arrowhead. On the habitat reserves, 1,006 acres of managed marsh would be created, which would provide potential habitat for Sanford's arrowhead. This acreage would more than offset the 124 acres of potential habitat predicted to be affected by urban development in the City of Sacramento; therefore, impacts would be less than significant.

Sutter County. Development in Sutter County would affect 10 acres of ponds and seasonally wet areas, and 215 acres of canals and ditches for a total impact to potential Sanford's arrowhead of 225 acres. With total urban development of 7,467 acres, 3,733 acres would be incorporated into a habitat reserve system. The reserve system would support about 933 acres of managed marsh, which would provide potential habitat for Sanford's arrowhead. This acreage would more than offset the 225 acres of potential habitat predicted to be affected by urban development in Sutter County; therefore, impacts would be less than significant.

Water Agencies. Independent implementation of the Proposed Action by RD 1000 and Natomas Mutual would not be expected to affect Sanford's arrowhead because this species is not known to inhabit the basin. If the species colonized canals or ditches in the future, management activities conducted by RD 1000 and Natomas Mutual could affect individual animals. No additional permanent habitat reserves with restored marsh habitat would be created to provide potential habitat for Sanford's arrowhead. Further, no attempts to introduce Sanford's arrowhead would be made.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the existing acquired habitat reserves for the benefit of covered species. Effects to covered species from

actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.3 Vernal Pool Species

City of Sacramento. Effects to vernal pools with implementation of the Proposed Action by the City of Sacramento would be the same as with participation by all applicants. Prior to issuance of development permits, areas proposed for development would be surveyed. If vernal pools or covered vernal pool species were identified, avoidance and mitigation measures would be implemented in the same manner as with participation by all applicants.

Sutter County. Effects to vernal pools under implementation of the Proposed Action by Sutter County would be the same as with participation by all applicants. Prior to issuance of development permits, areas proposed for development would be surveyed. If vernal pools or covered vernal pool species were identified, avoidance and mitigation measures would be implemented in the same manner as with participation by all applicants.

Water Agencies. If only the water agencies implemented the Proposed Action, the requirements for vernal pool species related to urban development would not be implemented under the Proposed Action because the water agencies' covered activities do not directly affect vernal pool species. Current regulatory requirements consist of conducting preconstruction surveys, obtaining ACOE permits if jurisdictional wetlands are involved, conducting Section 7 consultation with the USFWS if ACOE permitting is required, and implementing avoidance, minimization, and mitigation measures. If ACOE permitting and Section 7 consultations are not necessary, the land-use agencies would work with the USFWS and CDFG to identify specific measures to avoid, minimize, and mitigate impacts to vernal pool species pursuant to the Proposed Action if the development action would affect vernal pools or vernal pool species. This latter protective measure would not be implemented if only the water agencies implemented the Proposed Action.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.4 California Tiger Salamander

City of Sacramento. Effects to California tiger salamander with implementation of the Proposed Action by the City of Sacramento would be the same as with participation by all applicants. Prior to issuance of development permits, areas proposed for development would be surveyed. If vernal pools or other wetland habitat or tiger salamanders were identified, avoidance and mitigation measures would be implemented in the same manner as with participation by all applicants.

Sutter County. Effects to California tiger salamander with implementation of the Proposed Action by Sutter County would be the same as with participation by all applicants. Prior to issuance of development permits, areas proposed for development would be surveyed. If vernal pools or other wetland habitat or tiger salamanders were identified, avoidance and mitigation measures would be implemented in the same manner as with participation by all applicants.

Water Agencies. If only the water agencies implemented the Proposed Action, the requirements of the HCP related to urban development for vernal pools and specifically for tiger salamanders would not be implemented. The requirements of the Proposed Action consist of conducting preconstruction surveys, obtaining ACOE permits if jurisdictional wetlands are involved, conducting Section 7 consultation with the USFWS if ACOE permitting is required, and implementing avoidance, minimization, and mitigation measures. If ACOE permitting and Section 7 consultations are not necessary, the City and Sutter County would work with the USFWS and CDFG to identify specific measures to avoid, minimize, and mitigate impacts to vernal pool species (including tiger salamanders) if the development action would affect vernal pools or vernal pool species. This latter protective measure would not be implemented if only the water agencies implemented the Proposed Action.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.5 Western Spadefoot Toad

City of Sacramento. Effects to western spadefoot toads with implementation of the Proposed Action by the City of Sacramento would be the same as with participation by all applicants. Prior to issuance of development permits, areas proposed for development would be surveyed. If vernal pools or other wetland habitat or spadefoot toads were identified, avoidance and mitigation measures would be implemented in the same manner as with participation by all applicants.

Sutter County. Effects to spadefoot toads with implementation of the Proposed Action by Sutter County would be the same as with participation by all applicants. Prior to issuance of development permits, areas proposed for development would be surveyed. If vernal pools or other wetland habitat or spadefoot toads were identified, avoidance and mitigation measures would be implemented in the same manner as with participation by all applicants.

Water Agencies. If only the water agencies implemented the Proposed Action, the requirements of the HCP related to urban development for vernal pools and specifically for spadefoot toads would not be implemented. The requirements of the Proposed Action consist of conducting preconstruction surveys, obtaining ACOE permits if jurisdictional wetlands are involved, conducting Section 7 consultation with the USFWS if ACOE permitting is required, and implementing avoidance, minimization, and mitigation measures. If ACOE permitting and Section 7 consultations are not necessary, the City and Sutter County would work with the USFWS and CDFG to identify specific measures to avoid, minimize, and mitigate impacts to vernal pool species (including western spadefoot toad) if the development action would affect vernal pools or vernal pool species. This latter protective measure would not be implemented if only the water agencies implemented the Proposed Action.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.6 Valley Elderberry Longhorn Beetle

City of Sacramento. No riparian habitat would be affected if only the City of Sacramento implemented the Proposed Action. An unknown number of elderberry shrubs potentially inhabited by VELB could be affected by urban development in the City of Sacramento. The Service's Conservation Guidelines would be followed to avoid, minimize, and mitigate the impacts of urban development on VELB. The amount of potential habitat for VELB would probably increase over time as seedlings planted to compensate for removal of mature shrubs became large enough for VELB. Following the Service's Conservation Guidelines would mitigate for development-related impacts in the City of Sacramento.

Sutter County. If Sutter County independently implemented the Proposed Action, mitigation for removal of elderberry shrubs during urban development would follow the USFWS's Conservation Guidelines. Following these guidelines would mitigate for development-related impacts in Sutter County and, therefore, impacts would be less than significant.

Water Agencies. Although urban development would not be covered by the Proposed Action if only the water agencies implemented the Proposed Action, developers would need incidental take authorization to remove elderberry shrubs inhabited by VELB. Any removal of elderberry shrubs because of development therefore would be mitigated in accordance with the Conservation Guidelines, with similar effects to participation by all applicants anticipated.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the existing acquired habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.7 Giant Garter Snake

City of Sacramento. If only the City of Sacramento implemented the Proposed Action, 8,050 acres would be developed. This would affect 1,094 acres of giant garter snake habitat (i.e., rice, ponds and seasonally wet areas, and canals). As described under the Proposed Action, 50 percent of the reserve lands would be managed as rice and 25 percent would be managed as marsh. On this basis, 3,019 acres in the habitat reserves would provide habitat for giant garter snake. The managed marsh and rice on the habitat reserves would provide higher-quality habitat than the rice acreage that would be converted to urban development.

If the City of Sacramento implemented the HCP independently, the conservation strategy would mitigate the impacts to giant garter snakes associated with urban development within the City limits to a level that is less than significant.

If only the City participates (i.e., if the water agencies did not participate), no impacts would occur to the giant garter snake as a result of nonparticipation by the water agencies, because the canals and ditches would be maintained by the water agencies, regardless of whether RD 1000 or Natomas Mutual participated in implementing the HCP. As discussed in Section IV.C.1.d and shown in Figure 17 of the HCP, the water agencies have identified key canals that would be maintained for the duration of the 50-year permit term. These canals would be maintained as part of the water agencies' ongoing operations and would not be affected by their participation (or lack of participation) in the HCP.

Sutter County. If only Sutter County implemented the Proposed Action, 7,467 acres would be developed, which would affect 5,802 acres of giant garter snake habitat (i.e., rice, ponds and seasonally wet areas, and canals). Most of the reduction in potential habitat (i.e., existing acreage) would be rice (5,577 acres). Smaller amounts of canals (215 acres) and ponds and seasonally wet areas (10 acres) would also be converted by urban development. With 75 percent of the habitat reserves managed as rice and managed marsh, 2,800 acres in the habitat reserves would provide habitat for the giant garter snake. Of this amount, 1,866 acres would be rice and 934 acres would be managed marsh. The managed marsh would provide permanent, year-round habitat currently available only in canals and ponds and seasonally wet areas. The managed marsh would mitigate the impact to this important habitat at a ratio of about 4:1. The managed marsh and rice on the habitat reserves would provide higher-quality habitat than the rice that would be converted to urban development, resulting in impacts that are less than significant. It is anticipated that only about one third of the rice acreage that would be affected by urban development would be incorporated into the reserve system. As discussed above, the rice on the reserve system would provide higher-quality habitat than the rice acreage that would be affected by development. What is uncertain, however, is whether the 2,800 acres of higher-quality habitat on the reserves (both the rice and managed marsh) would provide the equivalent habitat value of the existing acreage (i.e., rice, canals, and ponds and seasonally wet areas).

If only Sutter County participates, (i.e., if the water agencies did not participate), no impacts would occur to the giant garter snake as a result of nonparticipation by the water agencies because the canals and ditches would be maintained by the water agencies, regardless of whether RD 1000 or Natomas Mutual participated in implementing the HCP. As discussed in Section IV.C.1.d and shown in Figure 17 of the HCP, the water agencies have identified key canals that would be maintained for the duration of the 50-year permit term. These canals would be maintained as part of the water agencies' ongoing operations and would not be affected by their participation (or lack of participation) in the HCP. In addition, if Sutter County did not participate, any development that occurred would be subject to Section 7 consultation under the ESA. This process would lead to site-specific mitigation measures being developed for the giant garter snake.

Water Agencies. If only the water agencies implemented the Proposed Action, no habitat reserves would be acquired and protected in perpetuity. The water agencies would implement measures to avoid and minimize the effects of their maintenance activities on giant garter snakes. These measures could have beneficial effects on the giant garter snake population in the Natomas Basin by reducing injury and mortality of snakes as well as improving the quality of the canals and ditches as habitat for giant garter snakes.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.8 Northwestern Pond Turtle

City of Sacramento. If only the City of Sacramento implemented the Proposed Action, 8,050 acres would be developed which would affect 1,118 acres of potential habitat for northwestern pond turtles (i.e., rice, ponds and seasonally wet areas, and canals). With

75 percent of the habitat reserves as rice or managed marsh, 3,019 acres in the habitat reserves would be habitat for northwestern pond turtles, about three times more than would be converted to urban uses. Managed marsh would be created on about 1,000 acres. Managed marsh would provide higher-quality habitat than the approximately 1,000 acres of rice that would be lost to urban development. In addition, upland habitat on the reserves would provide requisite nesting and wintering habitat. With the City of Sacramento's independent implementation of the Proposed Action, the conservation strategy would mitigate the impacts to northwestern pond turtles associated with urban development within the City limits.

Sutter County. If only Sutter County implemented the Proposed Action, 7,467 acres would be developed which would affect 5,802 acres of pond turtle habitat (i.e., rice, ponds and seasonally wet areas, and canals). The habitat reserves would contain 933 acres of managed marsh, 933 acres of upland habitat and 1,867 acres of rice, unless these acreages were adjusted in consideration of the adaptive management and midpoint review mechanisms if all the applicants do not participate. Based on Jennings and Hayes (1994), the availability of nesting habitat and rearing habitat free from predators and competitors appears to be the primary limiting factors to pond turtle populations in California. If these factors are similarly critical for pond turtles in the Natomas Basin, the habitat reserves would be expected to benefit northwestern pond turtles by providing areas where they can successfully reproduce.

Water Agencies. If only the water agencies implemented the Proposed Action, no habitat reserves would be acquired and protected in perpetuity. The water agencies would implement measures to avoid and minimize the effects of their maintenance activities on giant garter snakes. These measures could have beneficial effects to the northwestern pond turtle population in the Natomas Basin by reducing injury and mortality of turtles as well as improving the quality of the canals and ditches as habitat for pond turtles.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.9 White-faced Ibis

City of Sacramento. If only the City of Sacramento implemented the Proposed Action, 8,050 acres would be developed. This development would affect 1,094 acres of potential habitat for white-faced ibis (i.e., rice, ponds and seasonally wet areas, canals). A 4,025-acre habitat reserve system would be created, consisting of 25 percent managed marsh, 25 percent upland habitat and 50 percent rice. All of these habitats are potential habitat for white-faced ibis. Thus, about four times more habitat would be protected in the reserves than would be converted to urban uses. The habitat reserves would also provide higher-quality habitat. With this higher quality of habitat expected on the reserves, and considering that foraging habitat on wintering grounds and migratory routes probably is not limiting to ibis, protection and enhancement of four times the acreage affected by urban development would mitigate the impacts to white-faced ibis associated with urban development within the City limits. The creation of marsh habitat could support nesting and benefit the species, considering that nesting is the primary concern for this species.

Sutter County. If only Sutter County implemented the Proposed Action, 7,467 acres would be developed, which would affect 5,802 acres of habitat potentially used by white-faced ibis (i.e., rice, ponds and seasonally wet areas, and canals). The habitat reserves would consist of about 933 acres of managed marsh, 933 acres of upland habitat, and 1,867 acres of rice, for a total of 3,733 acres. For the same reasons as explained above for the City of Sacramento, the creation of managed marsh could benefit ibis by creating nesting opportunities.

Water Agencies. If only the water agencies implemented the Proposed Action, no habitat reserves would be acquired and protected in perpetuity. The water agencies would implement measures to avoid and minimize the effects of their maintenance activities on giant garter snakes. These measures could have minor beneficial effects to white-faced ibis by reducing the disturbance of ibis that might be foraging in the canals or ditches.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.10 Tricolored Blackbird

City of Sacramento. If only the City of Sacramento implemented the Proposed Action, 8,050 acres would be developed, affecting 148 acres of potential nesting habitat for tricolored blackbird (i.e., riparian, ponds and seasonally wet areas, and canals). With 25 percent of the habitat reserves as managed marsh, 1,006 acres in the habitat reserves would be habitat for high-quality nesting habitat for tricolored blackbird, about 10 times more than would be converted to urban uses. With the City of Sacramento's independent implementation of the Proposed Action, the conservation strategy would more than offset the impacts to tricolored blackbirds potentially resulting from urban development within the City limits. The substantial increase in suitable nesting habitat and its long-term protection would benefit tricolored blackbird.

Sutter County. Urban development proposed in Sutter County would result in the loss of about 225 acres of potential nesting habitat for tricolored blackbird. With 25 percent of the habitat reserves as managed marsh, 933 acres in the habitat reserves would be high-quality nesting habitat for tricolored blackbird, about four times the acreage that would be converted to urban uses. This level of habitat creation and protection would more than offset the impacts to tricolored blackbirds resulting from urban development in Sutter County. The substantial increase in suitable nesting habitat and its long-term protection would benefit tricolored blackbird.

Water Agencies. If only the water agencies implemented the Proposed Action, no habitat reserves would be acquired and protected in perpetuity. As explained above, management activities conducted by the water agencies are not anticipated to adversely affect tricolored blackbirds.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City

of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.11 Swainson's Hawk

City of Sacramento. Under the Proposed Action, 8,050 acres would be developed in the City of Sacramento. This development would affect 6,925 acres of potential foraging habitat for Swainson's hawk, of which 3,679 acres would be within 1 mile of known nest sites. As explained above, urban development in the City of Sacramento has the potential to lead to the abandonment of two existing territories.

The primary conservation strategy of the Proposed Action for mitigating the impacts of urban development is creating and protecting habitat reserves at a 0.5:1 ratio of acres protected in the habitat reserves for every acre developed. The habitat reserve system would consist of 4,025 acres. Under the Proposed Action, the habitat reserves are to consist of 25 percent managed marsh, 25 percent upland habitat, and 50 percent rice. Specifically, 1,006 acres in the habitat reserves would be upland habitat managed for Swainson's hawk foraging. If only the City of Sacramento implemented the Proposed Action, this would be considered a changed circumstance and the percentage composition of the habitat reserves could be adjusted as part of the adaptive management and midpoint review programs in response to the specific habitats affected by the participating jurisdiction. Thus, the amount of upland habitat could be increased to match more closely the anticipated reduction in upland habitat if only the City were to participate. Foraging opportunities for hawks also would be available in portions of the rice and managed marsh on the reserves, which would be considered in adjusting the habitat proportions of the reserves. In addition to creation and protection of the habitat reserves, the City of Sacramento would implement other measures for Swainson's hawk. These measures include protecting valley oaks and other trees that could provide nesting opportunities and implementing a tree-planting program to create new territories. With adjustments in the composition of the habitat reserves to provide more upland habitat in combination with other measures of the Proposed Action (e.g., tree-planting program), impacts to Swainson's hawk from urban development would be mitigated.

Sutter County. If only Sutter County implemented the Proposed Action, 7,467 acres would be developed, which would affect 1,860 acres of potential foraging habitat for Swainson's hawk, of which 165 acres would be within 1 mile of an existing nest site. No impacts to nesting habitat are predicted. With 25 percent of the habitat reserves as upland habitat, 933 acres in the reserves would be upland habitat specifically managed for Swainson's hawk. This acreage is about one-half the total amount of potential foraging habitat that would be converted to urban uses, but more than five times the amount of potential foraging habitat within 1 mile of an existing nest site. Because upland habitat for Swainson's hawk would be located to the extent possible in the Swainson's Hawk Zone along the Sacramento River, where it would be within 1 mile of existing nest sites, this level of habitat preservation would offset the impacts of urban development in Sutter County. In addition to the upland habitat component of the habitat reserves, portions of the rice and managed marsh on the reserves would provide additional foraging opportunities. Native trees would be incorporated into the habitat reserves, which would provide for the establishment of additional territories as the trees developed. Sutter County would initiate a general plan amendment process to redesignate the portion of the Industrial-Commercial Reserve in the

Swainson's Hawk Zone as agriculture. In combination, these measures would offset impacts to Swainson's hawk from urban development in Sutter County.

Water Agencies. If only the water agencies implemented the Proposed Action, no habitat reserves would be acquired and protected in perpetuity. The covered activities probably have minimal potential to affect Swainson's hawks. The water agencies would implement best management practices to maintain vegetative cover on the ditches and canals, providing food and protection for prey species. The water agencies also will limit rodent control measures to those necessary to maintain structurally sound flood-control levees. These measures would moderate the minor potential for the water agencies' covered activities to affect Swainson's hawks.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.12 Aleutian Canada Goose

City of Sacramento. If only the City of Sacramento implemented the Proposed Action, about 5,656 acres of potential Aleutian Canada goose habitat would be affected by urban development. All of the habitat in the 4,025-acre reserve system would provide potential habitat for the Aleutian Canada goose. Because Aleutian Canada geese currently use the Natomas Basin to a limited extent, urban development in the City of Sacramento is not expected to affect the species, at least in the short term. To the extent that Aleutian Canada geese use the basin in the future, the habitat reserves would be beneficial in providing high-quality habitat that is stable in amount and location in perpetuity.

Sutter County. If only Sutter County implemented the Proposed Action, 7,467 acres would be developed, almost all of which would be potential habitat for the Aleutian Canada goose (7,207 acres). All of the habitat in the 3,733-acre reserve system would provide potential habitat for the Aleutian Canada goose. Because this species uses the Natomas Basin to a limited degree, urban development in Sutter County is not expected to affect the species adversely. To the extent that Aleutian Canada geese use the basin in the future, the habitat reserves would be beneficial in providing high-quality habitat that is stable in amount and location in perpetuity. Therefore, no adverse impacts are anticipated.

Water Agencies. As with full participation, management activities conducted by the water agencies would not be expected to affect Aleutian Canada geese. If only the water agencies implemented the Proposed Action, no permanent habitat reserves would be established. As such there would be no certainty that habitat would be available that could be used by Aleutian Canada geese in the future.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.13 Burrowing Owl

City of Sacramento. If only the City of Sacramento implemented the Proposed Action, 8,050 acres would be developed, which would affect 450 acres of potential burrowing owl habitat. With 25 percent of the habitat reserves as upland habitat, 1,006 acres in the habitat reserves would be habitat for burrowing owl, more than twice than would be converted to urban uses. With the City of Sacramento's independent implementation of the Proposed Action, this level of habitat protection would mitigate the impacts to burrowing owl associated with urban development within the City limits.

Sutter County. If only Sutter County implemented the Proposed Action, 7,467 acres would be developed, affecting 235 acres of potential habitat for burrowing owl. With 25 percent of the habitat reserves as upland habitat, 933 acres in the reserves would be upland habitat. This acreage is about four times the total amount of habitat that would be converted to urban uses. With Sutter County's independent implementation of the Proposed Action, this level of habitat protection would mitigate the impacts to burrowing owl associated with urban development within the county limits.

Water Agencies. The water agencies would not implement any measures specifically to avoid and minimize the effects of their maintenance activities on burrowing owls. The impact of their activities on burrowing owl, however, is anticipated to be minor. If only the water agencies implemented the Proposed Action, no permanent habitat reserves would be established. As such there would be no certainty that habitat for burrowing owl would be available and colonies protected over the long term.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.14 Bank Swallow

City of Sacramento. Independent implementation of the Proposed Action by the City of Sacramento would not be expected to positively or negatively affect bank swallows. As explained above, the availability of suitable nesting substrates is the primary limiting factor for bank swallows. No suitable nesting sites exist or are expected to occur in the City of Sacramento. To the extent that bank swallows forage in areas that would be developed, creation of habitat reserves would provide higher-quality (more insects) foraging habitat that would be stable in amount and location in perpetuity, to compensate for any development effects.

Sutter County. For the same reasons as described for the City of Sacramento, independent implementation of the Proposed Action by Sutter County would not affect the bank swallows (either positively or negatively).

Water Agencies. Independent implementation of the Proposed Action by RD 1000 and Natomas Mutual would not be expected to positively or negatively affect the bank swallow. These agencies' operation and maintenance activities would not affect bank swallows. Although no permanent habitat reserves would be created, nesting habitat rather than

foraging habitat limits the bank swallow population. Foraging habitat in the Natomas Basin probably plays a minor role in maintaining the nearest colonies to the basin.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.2.15 Loggerhead Shrike

City of Sacramento. Under the Proposed Action, 8,050 acres would be developed which would affect 6,473 acres of potential habitat for loggerhead shrike. The primary conservation strategy of the Proposed Action for mitigating the impacts of urban development is creating and protecting habitat reserves at a 0.5:1 ratio of acres protected in the habitat reserves for every acre developed. The habitat reserve system would consist of 4,025 acres. Under the Proposed Action, the habitat reserves are to consist of 25 percent managed marsh, 25 percent upland habitat, and 50 percent rice. With 25 percent of the habitat reserves, 1,006 acres in the habitat reserves would be upland habitat suitable for loggerhead shrike. Implementation of the Proposed Action solely by the City of Sacramento would be considered a changed circumstance, and the percentage composition of the habitat reserves could be adjusted in response to the specific habitats affected by the participating jurisdiction. With this provision, the amount of upland habitat could be increased to more closely match the anticipated reduction in upland habitat.

Sutter County. If only Sutter County implemented the Proposed Action, 7,467 acres would be developed, which would affect 2,077 acres of potential habitat for loggerhead shrikes. With 25 percent of the habitat reserves as upland habitat, 933 acres in the reserves would be potential habitat for loggerhead shrike. This acreage is about one-half the potential habitat that would be converted to urban uses. The Conservancy also would provide trees and shrubs suitable for perching and nesting by loggerhead shrikes, ensuring that suitable conditions for shrikes are provided on the habitat by reserves, resulting in a less-than-significant impact.

Water Agencies. The water agencies would not implement any measures specifically to avoid and minimize the effects of their maintenance activities on loggerhead shrikes. The affect of their activities on loggerhead shrikes, however, is anticipated to be minor. If only the water agencies implemented the Proposed Action, no permanent habitat reserves would be established. Thus, there would be no certainty that habitat for loggerhead shrikes would be available over the long term.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Effects to covered species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.3 Other Special-status Species

City of Sacramento. Habitat reserves created in response to urban development in the City of Sacramento would benefit special-status species not covered by the ITPs by providing high-quality habitat in perpetuity. Effects to special-status species from urban development in Sutter County would be as described for the No Action Alternative.

Sutter County. If only Sutter County implemented the Proposed Action, habitat reserves would be created in response to urban development. The habitat reserves would benefit special-status species not covered by the ITPs by providing high-quality habitat in perpetuity. Effects to special-status species from urban development in the City of Sacramento would be as described for the No Action Alternative.

Water Agencies. Minor beneficial effects to special-status species not covered by the ITPs could result from the water agencies' implementing avoidance, minimization, and mitigation measures for giant garter snakes. If only the water agencies implemented the Proposed Action, no habitat reserves would be created. Effects to special-status species not covered by the ITPs from urban development in the City of Sacramento and Sutter County would be as described for the No Action Alternative.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Other special-status species likely would benefit from management of the habitat reserves. Effects to other special-status species from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.11.4 Waterfowl

City of Sacramento. Habitat reserves created in response to urban development in the City of Sacramento would benefit waterfowl by providing marsh and upland habitat in perpetuity that waterfowl could use as wintering or migratory stopover habitat. Effects to waterfowl from urban development in Sutter County would be as described for the No Action Alternative.

Sutter County. If only Sutter County implemented the Proposed Action, habitat reserves would be created in response to urban development. The habitat reserves would benefit waterfowl species by providing marsh and upland habitat that could be used as wintering and migratory stopover habitat over the long term. Effects to waterfowl from urban development in the City of Sacramento would be as described for the No Action Alternative.

Water Agencies. Because of the low level of use of ditches and canals by waterfowl, independent implementation of the Proposed Action by the water agencies would not affect waterfowl. Effects to waterfowl from urban development in Sutter County or City of Sacramento would be as described for the No Action Alternative.

Natomas Basin Conservancy. As described above, if only the Conservancy implemented the Proposed Action, its actions would focus on maintaining and managing the habitat reserves for the benefit of covered species. Waterfowl would benefit from the provision of habitat on the reserves. Effects to waterfowl from actions taken by the City of Sacramento, Sutter County, and the water agencies would be as described for the No Action Alternative.

4.4.12 Cumulative Impacts

As described in Section 4.1.2.2, the cumulative impact analysis considers other local and regional projects that address wildlife conservation, including special-status species. These other projects predominantly include protection and management of marsh habitat (i.e., state and federal refuges). The Proposed Action would contribute to the existing network of marsh areas under long-term conservation in the Central Valley. As such, in combination with other projects, the Proposed Action would have a cumulatively beneficial effect on wildlife habitat, particularly marsh habitat. The CALFED Bay-Delta Program and the San Joaquin County Habitat Conservation Plan specifically address listed species, with the goals of maintaining or recovering listed species and special-status species. The Proposed Action would further benefit listed species and special-status species by maintaining them in the Natomas Basin. In combination with other projects, the Proposed Action would cumulatively contribute to the maintenance and recovery of listed species in the Central Valley.

4.5 Cultural Resources

Potential archaeological and historical resource impacts that could occur in the study area are summarized in this section. For purposes of this analysis, potential impacts to cultural and historical resources would primarily occur during habitat development activities on the reserve system. Reserve development generally includes earth-moving activities associated with the conversion of upland or other land uses to managed marsh or rice fields. Impacts to cultural and historical resources would be considered a significant impact if the activities would:

- Cause a substantial adverse change in the significance of a historical resource
- Cause a substantial adverse change in the significance of an archaeological resource
- Disturb any human remains, including those interred outside of formal cemeteries

The potential for significant effects on cultural resources exists wherever grading and other land-disturbing activities occur. Potential impacts could be mitigated to a less-than-significant level by implementing avoidance measures described in this section. These avoidance measures are standard practice for large-scale developments, and are recommended for the implementation of the Proposed Action and other alternatives.

As discussed in Section 4.1.3, the covered activities associated with the Proposed Action have been analyzed in previous environmental documents, and the collective findings of the previous analysis for cultural resources are briefly summarized here and in Appendix C to provide context for the action being evaluated in this EIR/EIS (See Chapter 2: Proposed Action and Alternatives). (Also see Section 4.1.3 for a list of environmental review documents applicable to the permittees' covered activities and the location at which they are available for review.)

Both the City Council of the City of Sacramento and the Sutter County Board of Supervisors determined that potential impacts to cultural resources associated with urban development could be reduced to a less-than-significant level with the implementation of mitigation measures. In its EIRs for the North and South Natomas Community Plans, the City identified two areas of high sensitivity – the Witter Ranch Historic Farm and the area in the southwest corner of South Natomas near where I-80 crosses the Sacramento River and

Garden Highway. As part of the North Natomas Community Plan, the City required the preservation of Witter Ranch, which is now under the ownership of Sacramento County as part of the regional park system. The City's mitigation requirements for the area in the southwest corner of South Natomas, and for Sutter County in general, include archaeological reconnaissance surveys prior to development, with implementation of additional measures as recommended by a qualified archaeologist on a site-specific basis. Areas of high archaeological sensitivity were not specifically identified in the Sutter County General Plan EIR.

4.5.1 Proposed Action

4.5.1.1 Impacts With Participation by All Permittees

Implementation of the Proposed Action would result in the creation of 8,750 acres of habitat reserves, based on 17,500 acres of urban development and a 0.5:1 mitigation ratio. Habitat reserves would be established subject to the provisions of the HCP, including the requirements for one 2,500-acre contiguous reserve, 400-acre minimum reserve sizes, and not more than 20 percent of reserves allowed outside of the Natomas Basin. Potential impacts to cultural resources would primarily occur during habitat restoration activities. Earthmoving would be limited to parcels acquired for habitat preserves requiring restoration to managed marsh or other high-quality habitat, and such improvements would likely be required on at least 25 percent of the reserve lands (2,187.5 acres). Earthmoving activities would typically include grading, excavating, and other activities involving the use of heavy equipment. These activities could result in exposure, damage, or crushing of surface and buried artifacts. Because the study area has been determined to be a medium to high area of potential chance for encountering artifacts (see Section 3.5), this would be a potentially significant impact.

The entire Natomas Basin is considered part of the RD 1000 Rural Historic Landscape District, which recognizes the substantial public works achievement of reclaiming the Natomas Basin through a comprehensive system of levees and drainage canals. Implementation of the Proposed Action would result in some land use changes as described above, including converting some agricultural areas to managed marsh and uplands, but these activities do not conflict with the character of the Rural Historic Landscape District because the overall agricultural/open space character of the Natomas Basin will be maintained.

Potential impacts to cultural resources on an ongoing basis could result from the operation and maintenance of canals and ditches by RD 1000 and Natomas Mutual, and habitat preserves managed as ricefields by the Conservancy through seasonal disking of rice fields. The potential for long-term impacts, however, is limited because such work would generally be limited to surface activities (e.g., mowing, disking) in areas that have been subject to ongoing management and disturbance.

4.5.1.2 Mitigation

Standard cultural resources mitigation procedures of the City and Sutter County (City of Sacramento, 1987; Sutter County, 1996c) include site-specific record searches, field review where appropriate, and construction monitoring (by an archaeologist where recommended or by construction personnel). These mitigation requirements generally apply to new development. Because the potential cultural resource impacts associated with habitat

reserve development are similar to the impacts of land development (e.g., grading and excavation), similar mitigation is warranted. Accordingly, the following mitigation measures are recommended for potential cultural-resource impacts.

> Parcels being considered for habitat reserves shall undergo preconstruction literature review and/or field surveys, based on the discretion of a qualified archaeologist. Based on the findings of the cultural resource review and the potential for land disturbance to occur on the reserve, the Natomas Basin Conservancy could be required to complete an archaeological report and implement site-specific mitigation measures as a condition for restoration.
>
> and
>
> In the event that any historic or archaeological features (surface or subsurface) or deposits, including locally darkened soil ("midden") that could conceal cultural deposits, animal bone, shell, obsidian, mortars, or human remains, are uncovered during construction, work within 100 feet of the find shall cease and a qualified archaeologist and a representative of the Native American Heritage Commission shall be consulted to develop, if necessary, further mitigation measures to reduce any archaeological impacts to a less-than-significant level before construction continues.
>
> and
>
> When Native American archaeological, ethnographic, or spiritual resources are involved, all identification and treatment shall be conducted by qualified archaeologists who are either certified by the Society of Professional Archaeologists (SOPA) or who meet the federal standards as stated in the *Code of Federal Regulations* (36 *CFR* 61), and Native American Representatives who are approved by the local Native American community as scholars of their cultural traditions. In the event that no such Native American is available, persons who represent tribal governments and/or organizations in the locale in which resources could be affected shall be consulted. When historic archaeological sites or historic architectural features are involved, all identification and treatment is to be carried out by historical archaeologists or architectural historians. These individuals shall meet either SOPA or 36 *CFR* 61 requirements.
>
> and
>
> If human bone of unknown origin is found during construction, all work shall stop in the vicinity of the find and the County Coroner shall be contacted immediately. If the remains are determined to be Native American, the Coroner shall notify the Native American Heritage Commission who shall notify the person it believes to be the most likely descendant. The most likely descendant shall work with the contractor to develop a program for reinternment of the human remains and any associated artifacts. No additional work is to take place within the immediate vicinity of the find until the identified appropriate actions have been carried out.

4.5.1.3 Level of Significance After Mitigation

Implementation of these mitigation measures is expected to reduce potential cultural resources impacts to a less-than-significant level. Site-specific cultural resource review could show a greater potential for significant impacts; however, specific information is not known at this time.

4.5.2 Alternative 1. Increased Mitigation Ratio

4.5.2.1 Impacts With Participation by All Permittees

Implementation of Alternative 1 would require mitigation of 17,500 acres of land, pursuant to a 1:1 mitigation ratio for new development. The types of potential cultural resource impacts would be similar to the Proposed Action (potentially significant), but the potential for impacts would be greater as a result of implementing a 1:1 mitigation ratio. The specific level of impact, however, is not possible to estimate because impacts would occur only as a result of disturbing sensitive resources during grading and other land-development activities. As described above for the Proposed Action, site-specific cultural resources evaluation should be required.

Potential impacts to cultural resources on an ongoing basis could result from the operation and maintenance of canals and ditches by RD 1000 and Natomas Mutual, and habitat preserves managed as ricefields by the Conservancy through seasonal disking of rice fields. The potential for long-term impacts, however, is limited because such work would generally be limited to surface activities (e.g., mowing, discing) in areas that have been subject to ongoing management and disturbance.

4.5.2.2 Mitigation

Implement the mitigation measures described for the Proposed Action (Section 4.5.2.1).

4.5.2.3 Level of Significance After Mitigation

Implementation of the mitigation measures described for the Proposed Action is expected to reduce potential cultural resources impacts to a less-than-significant level. Site-specific cultural resource review could show a greater potential for significant impacts; however, specific information is not known at this time.

4.5.3 Alternative 2. Habitat-based Mitigation

Implementation of Alternative 2 would require the acquisition of 17,763 acres of land for mitigation pursuant to the habitat-based mitigation ratios described in Section 2.6.2. Because the mitigation acreage under Alternative 2 would be approximately the same as under Alternative 1, potential impacts to cultural resources as a result of habitat reserve development would be approximately the same as described above for Alternative 1. Accordingly, implementing the mitigation measure described under the Proposed Action (Section 4.5.1.2) is also recommended for Alternative 2. As described for the Proposed Action, no impacts would occur as a result of RD 1000's or Natomas Mutual's activities, or as a result of ongoing Conservancy management of the habitat reserves.

4.5.4 Alternative 3. Reserve Zones

Alternative 3 focuses the acquisition of habitat reserves of specific zones within the Natomas Basin based on giant garter snake and Swainson's hawk habitat availability. The acreage to be acquired and all other implementation requirements would be the same as the Proposed Action. Therefore, the potential impact to cultural resources as a result of habitat reserve development would be the same as under the Proposed Action. Implementing the mitigation measure described under the Proposed Action (Section 4.5.1.2) is also

recommended for Alternative 3. As described for the Proposed Action, no impacts would occur as a result of RD 1000's or Natomas Mutual's activities, or as a result of ongoing Conservancy management of the habitat reserves.

4.5.5 Alternative 4. Reduced Potential for Incidental Take

Development of 12,000 acres under Alternative 4 would result in the acquisition of 6,000 acres of habitat reserves, based on a 0.5:1 mitigation ratio. Compared with the Proposed Action , implementing Alternative 4 would result in less land being conserved as habitat reserves (6,000 acres under Alternative 4 versus 8,750 acres under the Proposed Action). Because less land would be developed as habitat reserves under Alternative 4, the potential for impacts to cultural resources relative to the Proposed Action would decrease. Regardless, the potential for impacts to cultural resources to occur during grading to create managed marsh and other habitat areas, although reduced under Alternative 4, warrants the adoption of the mitigation measures described under the Proposed Action (Section 4.5.1.2) because of the extent of the reserve development activities. As described for the Proposed Action, no impacts would occur as a result of RD 1000's or Natomas Mutual's activities, or as a result of ongoing Conservancy management of the habitat reserves.

4.5.6 Alternative 5. No Action Alternative

Establishment of the habitat reserve system and the conservation measures in the HCP under the Proposed Action and the other alternatives would not occur under the No Action Alternative. As discussed in Section 2.6.5, planned land development and the associated mitigation for biological resources impacts would still occur, however, and it is expected that such mitigation would require active habitat restoration efforts resulting in similar effects as described above for the Proposed Action and the other alternatives. These activities would be similar to current land management practices in the Natomas Basin and similar habitat areas, and are not expected to result in substantially different impacts relative to current conditions. The mitigation measures described in Section 4.5.1.2 would likely be required as a result of CEQA review during these individual habitat conservation activities.

Under the No Action Alternative, RD 1000 and Natomas Mutual would continue their activities consistent with current practices, with no substantial change relative to the Proposed Action or the other alternatives. Management of habitat reserves by the Conservancy would still be required, resulting in similar impacts as under the Proposed Action and other alternatives.

The Proposed Action and alternatives are expected to have similar effects as the No Action Alternative, and impacts would therefore be less than significant relative to the No Action Alternative baseline.

4.5.7 Effects Under Independent Implementation

Regardless of whether all the permittees participate or individual permittees participate, the potential exists for cultural resources to occur on lands acquired as habitat reserves. Although the potential for impacts diminishes with less land disturbance, independent implementation of the Proposed Action by individual permittees would not reduce the level of potential significance because land disturbance (and the potential for disrupting unknown, subsurface cultural resources) would still occur. With implementation of the

mitigation measures described in Section 4.5.1.2 above, however, impacts would remain less than significant. Because implementation by RD 1000 and Natomas Mutual would have no effect on cultural resources, there would be no change in the level of significance of impacts if the water agencies did not participate in implementing the HCP.

4.5.8 Cumulative Impacts

Cumulative impacts would include the additional effects associated with the implementation of other regional conservation activities (see Section 4.1.2). Potential effects on cultural resources associated with management activities in these areas would likely be similar to the effects described above in Section 4.5.1.1 (e.g., exposure, damage, or crushing of surface and buried artifacts). Although impacts associated with other habitat conservation activities could affect site-specific cultural resources, these impacts would not affect cultural resources in the study area because these activities would not occur in the Natomas Basin or Area B. Therefore, no cumulative impacts would occur.

4.6 Land Use

This section describes the compatibility of the Proposed Action with surrounding land uses, and the Proposed Action's consistency with local land use plans and policies. The loss of agricultural lands as a result of converting rice crops to habitat reserves is also addressed in this section. Other environmental factors that serve as indicators of land use compatibility, such as diminished air quality, unacceptable noise levels, and substantial traffic congestion, are discussed in other sections. For purposes of this analysis, the Proposed Action would have a significant impact if it were to:

- Physically divide an established community
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Proposed Action (including, but not limited to the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect
- Conflict with existing zoning for agricultural use, or a Williamson Act contract
- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use
- Involve other changes in the existing environment which, because of their location or nature, could result in conversion of Farmland to nonagricultural use

Implementation of the Proposed Action would have less-than-significant land use impacts, but would have significant, and likely unavoidable, impacts on agricultural lands because of the amount of land that would be converted to managed marsh and other natural habitat areas. No land use impacts would occur as a result of activities undertaken by RD 1000 and Natomas Mutual. From a land-use compatibility perspective, RD 1000's and Natomas Mutual's activities under the Proposed Action would be similar to and consistent with current approved practices. Accordingly, implementation of the Proposed Action by RD 1000 and Natomas Mutual is not discussed further in this section.

As discussed in Section 4.1.3, the covered activities associated with the Proposed Action have been analyzed in previous environmental documents, and the collective findings of the previous analysis for land use are briefly summarized here and in Appendix C to provide context for the action being evaluated in this EIR/EIS (See Chapter 2: Proposed Action and Alternatives). (Also see Section 4.1.3 for a list of environmental review documents applicable to the permittees' covered activities and the location at which they are available for review.)

Both the City Council of the City of Sacramento and the Sutter County Board of Supervisors determined that impacts to agricultural land would be a significant and unavoidable consequence of urban development in the Natomas Basin. Both jurisdictions adopted partial mitigation to reduce the extent of the impact (generally consisting of buffers in the City and compact development in Sutter County), but these mitigation measures would not reduce impacts to a less-than-significant level. The City also determined that new development potentially could be incompatible with existing development, but that such potential impacts could be mitigated to a less-than-significant level through buffering and the site-specific development review process. Sutter County did not identify other potentially significant land use impacts.

4.6.1 Proposed Action

4.6.1.1 Impacts With Participation by All Permittees

Land Use Compatibility

Implementation of the Proposed Action would result in 8,750 acres of habitat reserves, based on urban development of 17,500 acres and a 0.5:1 mitigation ratio. Habitat reserves would be established subject to the provisions of the HCP, including the requirements for one 2,500-acre contiguous reserve, 400-acre minimum reserve sizes, and not more than 20 percent of reserves allowed outside of the Natomas Basin. The conservation measures outlined in the HCP would be implemented. Subsequent to the approval of the 1997 HCP (see Section 1.2) and prior to the release of this Draft EIR/EIS, 12 parcels have been acquired for conversion to habitat reserves, totaling over 2,000 acres. In addition, as a result of the Court Opinion (see Section 1.2.2), the City entered into a Settlement Agreement on May 10, 2001, which provided for an additional 1,668 acres of development and included specific reserve acquisition goals.

A management plan has been prepared for nine of the 12 acquired parcels. This management plan, together with the general policies of the Natomas Basin HCP, provide a framework for understanding the potential land use consequences of the Proposed Action.

Creation of habitat reserves within a predominately agricultural area could result in land use compatibility conflicts. Habitat reserves would be managed primarily to meet the life needs of giant garter snakes, Swainson's hawks, and other covered species, whereas adjacent farmlands would generally be managed for crop production. Rice farming is recognized, however, in the HCP as an important contributor to maintaining giant garter snake populations, and therefore up to 50 percent of the habitat reserves would remain in rice production as part of the overall wetland conservation strategy. This promotes land use compatibility between the habitat reserves and adjacent farmlands. In addition, various components of the overall reserve acquisition strategy and management criteria would

provide additional protection against potential conflicts between habitat reserves and adjacent lands, as follows.

- **Buffers** are intended to help ensure that habitat requirements are met onsite and are not diminished by adjacent land use activities. This also protects adjacent landowners from any responsibility or liability related to species' needs on the habitat reserves.
- **Setbacks** are an acquisition criteria for reserve lands, intended to prevent the acquisition of reserves that abut potentially incompatible land uses, including single-family residential uses as these uses expand into the Natomas Basin.
- **Mosquito and rodent control** measures would be implemented on the reserve lands.
- **Patrolling** of the reserves would occur periodically to monitor for prohibited activities such as vandalism, shooting, and off-road vehicle activity.

These requirements are considered to be an effective means of limiting potential land use incompatibility. Therefore, this impact would be less than significant, and no additional mitigation would be necessary beyond the proposed requirements of the HCP.

Consistency With Land Use Plans and Policies

The assessment of consistency of the habitat reserves with land use plans and policies focuses on Sutter County and unincorporated Sacramento County. Lands acquired for habitat reserves in Sacramento County are most likely to be located outside of the County's urban services boundary. These lands are designated primarily as agricultural cropland in the Sacramento County General Plan. Habitat reserves in Sutter County are most likely to be located outside of the Industrial-Commercial Reserve. These lands are designated primarily as agriculture in the Sutter County General Plan.

Both the Sacramento County and Sutter County General Plans recognize the potential for conflicts between habitat reserves and adjacent farmlands. The Sacramento County General Plan recognizes that agricultural lands could be converted to nonfarm uses other than urban development, and includes a series of policies (Policies AG-9 through AG-15) that address "encroachment by natural resource preserves." These policies focus on the need to preserve farmers' rights to carry out routine agricultural activities, and not to have those rights hindered by a noncompatible adjacent use. Similarly, the Sutter County General Plan states that lands set aside as mitigation for development in the Natomas Basin shall not result in impacts to existing and future agricultural or urban development (Policies 1.F-2 and 6.A-5). In addition to these policies, both counties have right-to-farm ordinances.

As described in the above sections, the Proposed Action includes measures such as buffers and setbacks to avoid conflicts with surrounding land uses. It is the responsibility of the implementing agencies to ensure that land use conflicts do not occur as a result of acquisition and ongoing management of the habitat reserves. For these reasons, implementing the Proposed Action is expected to be consistent with the Sacramento County and Sutter County General Plans.

Wildlife preserves are a permitted use in the zoning ordinance for Sacramento County, but are not mentioned in the Sutter County zoning ordinance.

Conversion of Agricultural Land

Implementation of the Proposed Action would result in the creation of 8,750 acres of habitat reserve lands. These reserves would be located in the Natomas Basin and (potentially) other nearby areas that are productive farmlands. Accordingly, up to 8,750 acres of farmlands in the Natomas Basin would become habitat reserves. As described in Section 3.6, most of the undeveloped lands in the Natomas Basin are considered "important farmlands" by the California Department of Conservation. A portion of the habitat reserves would remain in agricultural production (e.g., 50 percent in rice production, some Swainson's hawk foraging areas) and be preserved in perpetuity, but a substantial amount of reserve lands would be converted to managed marsh or upland habitat areas. Because of the managed marsh objectives of the HCP, it is expected that 25 percent of the reserves (2,187.5 acres) would be converted from current uses (primarily agriculture) to managed marsh. In addition, a portion of the upland reserves might also be converted to non-farm use (e.g., tree groves). This loss of at least 2,187.5 acres of important farmlands would be a significant impact. Preservation in perpetuity of the habitat reserves managed for agriculture would be a beneficial impact.

4.6.1.2 Mitigation

A significant impact has been identified for the loss of farmland. Mitigation for this impact should focus on integrating farmland preservation, where practicable, into site-specific management plans. The following mitigation measure is recommended:

> To the extent practicable (and to the extent that biological goals are not compromised), development of site-specific management plans will incorporate provisions that consider farmlands and agricultural use.

4.6.1.3 Level of Significance After Mitigation

The ability to implement this mitigation measure could be limited by the priority of other criteria for acquisition of reserve lands (e.g., the habitat suitability of lands to be acquired), and by the availability of nonagricultural land in the study area. Accordingly, impacts to agricultural land are likely to remain significant.

4.6.2 Alternative 1. Increased Mitigation Ratio

4.6.2.1 Impacts With Participation by All Permittees

Land Use Compatibility

Implementation of Alternative 1 would require mitigation of 17,500 acres of land, pursuant to a 1:1 mitigation ratio for the planned development (see Chapter 2 for a discussion of the land use agencies' covered activities under the Proposed Action). The potential for land use incompatibility impacts as a result of implementing Alternative 1 would increase with the additional mitigation acreage required, but impacts are expected to remain less than significant because of the implementation of the reserve acquisition and management requirements described in Section 4.6.1.1. For the same reasons as described above for the Proposed Action, impacts associated with RD 1000 or Natomas Mutual activities, or as a result of ongoing Conservancy management of the habitat reserves, would remain less than significant under Alternative 1.

Consistency With Land Use Plans and Policies

Consistency with land use plans and policies would be the same as described in Section 4.6.1.1 if 17,500 acres of habitat reserves are acquired.

Conversion of Agricultural Land

Compared with the Proposed Action, the requirement to acquire 17,500 acres of habitat reserve lands under Alternative 1 would double the amount of land taken out of agricultural production and converted to habitat use. Based on a 1:1 mitigation ratio with 25 percent of the acquired reserve lands converted to managed marsh, at least 4,375 acres of agricultural lands could be taken out of production. As described in Section 4.6.1.1 under the discussion of the Proposed Action, the loss of a substantial amount of agricultural lands would be a significant impact. Preservation in perpetuity of the habitat reserves managed for agriculture would be a beneficial impact.

4.6.2.2 Mitigation

The mitigation is to implement the mitigation measure stated in Section 4.6.1.2 for the loss of farmland.

4.6.2.3 Level of Significance After Mitigation

The ability to implement this mitigation measure fully could be limited by the priority of other criteria for acquisition of reserve lands (e.g., the habitat suitability of lands to be acquired) and by the availability of nonagricultural land in the study area. Accordingly, impacts to agricultural land are likely to remain significant.

4.6.3 Alternative 2. Habitat-based Mitigation

Implementation of Alternative 2 would require the acquisition of 17,763 acres of land for mitigation pursuant to the habitat-based mitigation ratios described in Section 2.6.2. Because the mitigation acreage under Alternative 2 would be approximately the same as under Alternative 1, potential land use impacts as a result of implementing a habitat-based mitigation alternative would be approximately the same as described above for Alternative 1. Accordingly, implementing the mitigation measure described under the Proposed Action (Section 4.6.1.2) is also recommended for Alternative 2. For the same reasons as described above for the Proposed Action, impacts associated with RD 1000 or Natomas Mutual activities, or as a result of ongoing Conservancy management of the habitat reserves, would remain less than significant under Alternative 2.

4.6.4 Alternative 3. Reserve Zones

Alternative 3 focuses on the acquisition of habitat reserves of specific zones within the Natomas Basin, based on giant garter snake and Swainson's hawk habitat availability. The acreage to be acquired and all other implementation requirements would be the same as the Proposed Action. Therefore, the potential land use impacts as a result of implementing the Reserve Zone Alternative would be the same as under the Proposed Action. Implementing the mitigation measure described under the Proposed Action (Section 4.6.1.2) is also recommended for Alternative 3. For the same reasons as described above for the Proposed Action, impacts associated with RD 1000 or Natomas Mutual activities, or as a result of

ongoing Conservancy management of the habitat reserves, would remain less than significant under Alternative 3.

4.6.5 Alternative 4. Reduced Potential for Incidental Take

Development of 12,000 acres under Alternative 4 would result in the acquisition of 6,000 acres of habitat reserves, based on a 0.5:1 mitigation ratio. Compared with the Proposed Action, implementing Alternative 4 would result in less land being conserved as habitat reserves (6,000 acres under Alternative 4 versus 8,750 acres under the Proposed Action). For the reasons described above in Section 4.6.1.1, impacts associated with land use compatibility and consistency with land use plans and policies would be less than significant. Under Alternative 4, less agricultural land would be converted to managed marsh and other habitat areas. Conversion of farmland to managed marsh would occur on 25 percent of the acquired reserve lands (i.e., 1,500 acres); this represents a substantial loss of farmland acreage, and would be a significant impact. The mitigation measure described in Section 4.6.1.2 is recommended, but mitigation to a less-than-significant level could be limited by the priority of other criteria for acquisition of reserve lands (e.g., the habitat suitability of lands to be acquired), and by the availability of nonagricultural land in the study area (see Section 4.6.1.3). Preservation in perpetuity of the habitat reserves managed for agriculture would be a beneficial impact. For the same reasons as described above for the Proposed Action, impacts from RD 1000 or Natomas Mutual activities, or as a result of ongoing Conservancy management of the habitat reserves, would remain less than significant under Alternative 4.

4.6.6 Alternative 5. No Action Alternative

Establishment of the habitat reserve system or implementation of the conservation strategy under the Proposed Action and the other alternatives would not occur under the No Action Alternative. As discussed in Section 2.6.5, planned land development and the associated mitigation for biological resources impacts would still occur, and it is expected that such mitigation would require active habitat restoration efforts resulting in similar effects as described above for the Proposed Action and the other alternatives. These activities would be similar to current land-management practices in the Natomas Basin and similar habitat areas, and are not expected to result in substantially different impacts relative to current conditions.

Under the No Action Alternative, RD 1000 and Natomas Mutual would continue their activities consistent with current practices, with no substantial change relative to the Proposed Action or the other alternatives, and therefore, impacts would not differ from existing conditions. Management of existing habitat reserves by the Conservancy would still be required, resulting in similar impacts as described for the Proposed Action and other alternatives.

The Proposed Action and alternatives are expected to have similar effects as the No Action Alternative. Relative to the No Action Alternative, land use consistency impacts would continue to be less than significant, and activities would remain consistent with adopted land use plans and policies.

4.6.7 Effects Under Independent Implementation

4.6.7.1 Land Use Compatibility

Under the Proposed Action, land use incompatibility is not likely to occur on lands developed as habitat reserves because of the measures described in Section 4.6.1.1, above, (e.g., buffers, setbacks). If only the City and Sutter County participate in implementing the Proposed Action, this conclusion would not change because the same measures would be implemented by either the City or Sutter County. If only one land use jurisdiction participated in the HCP, however, fewer acres would initially be affected because the acreage of reserve development would decrease commensurate with reduced land development. Although the land use impacts under independent implementation would be comparable to the Proposed Action, they would initially apply to fewer areas. It is anticipated, however, that land development would still occur in either the City or Sutter County (even if one jurisdiction did not participate) because development would occur on a project-by-project basis (see Section 2.6.5).

If only the water agencies participated, no land use incompatibility would result because the water agencies' covered activities would not change from existing conditions, and these exisiting management activities are conducted in accordance with applicable land use plans.

The Conservancy's mandate is to acquire and manage habitat reserve lands, and their participation is aligned with continued management of existing reserves and acquisition and management of future reserves consistent with existing land uses.

4.6.7.2 Consistency With Land Use Plans and Policies

Consistency with land use plans and policies would not change if the City or Sutter County did not participate in implementing the HCP. If only one of these entities participated, it would still comply with its applicable land use plans and policies. As noted above, the water agencies' and the conservancy's covered activities would remain the same as existing conditions (water agencies) or would be focused on managing existing reserves (conservancy). These actions would be consistent with land use plans and policies.

4.6.7.3 Conversion of Agricultural Land

As with land use compatibility (Section 4.6.7.1), less land would initially be converted from prime agricultural land if only the City or Sutter County participated. Based on the proposed 0.5:1 mitigation ratio with 25 percent of the habitat reserves removed from agricultural production, nonparticipation by the City or Sutter County would result in 1,006 and 933 fewer acres, respectively, removed from production. Although limited participation could reduce the amount of agricultural land conversion, impacts would remain significant based on the amount of land (likely in excess of 1,000 acres) that would be converted to nonagricultural use. In addition, development in either the City or Sutter County could occur outside of the Proposed Action process evaluated in this EIR/EIS.

If only the water agencies participated, no significant impacts to agricultural land would occur because the water agencies' covered activities would not result in development that would convert agricultural land to urban use. In addition, the water agencies' activities would not result in the creation of habitat reserves that would convert existing agricultural lands to non-agricultural uses. Similarly, the Conservancy's covered activities would

generally be limited to management of existing reserves and, therefore, would not result in conversion of agricultural land. The potential does exist, however, for the Conservancy to acquire additional lands, and this could result in some conversion of agricultural lands and is a potentially significant impact. These lands, however, would be converted to habitat reserves with the objective of species preservation, and such a conversion would not represent an irretrievable loss of the lands to urban development.

4.6.8 Cumulative Impacts

Cumulative impacts would include the additional effects associated with the implementation of other regional conservation activities (see Section 4.1.2). The potential for land use incompatibility or plan consistency effects associated with management activities in the areas covered by other regional conservation or management plans would be similar to the effects described above in Section 4.6.1.1. Potential land use incompatibility and plan consistency impacts caused by other habitat conservation activities could have effects in the study area, but would not result in cumulative impacts because these activities would not occur in the Natomas Basin or Area B. Therefore, cumulative impacts would not occur.

Implementation of other habitat-conservation planning activities could result in local conversions of agricultural lands to nonagricultural uses. Because loss of prime farmland is a statewide issue of concern, these management actions could contribute to the significant effect of approximately 2,187.5 acres of farmland converted to managed marsh with implementation of the Proposed Action. This could result in a cumulatively considerable incremental contribution to the statewide loss of agricultural lands. Mitigation for this impact is described in Section 4.6.1.2. Additional mitigation could include the purchase of conservation easements on other agricultural lands to ensure the preservation of farming, but mitigation to less-than-significant levels may not be possible.

4.7 Socioeconomics

This section describes the potential impacts of the Proposed Action on social and economic conditions. The section focuses primarily on how changing land use from private farmlands to habitat reserves operated by the Conservancy would affect employment and tax revenues. For purposes of this analysis, the Proposed Action would have a significant impact if it were to result in a substantial loss of:

- Employment opportunities
- Income-producing activities
- Property tax revenues

The analysis in this section concludes that adverse social and economic impacts would occur as a result of implementing the Proposed Action. To some extent, these effects would be offset by the management actions by the Conservancy. These impacts, however, would be less than significant in relation to the overall economies of Sacramento and Sutter Counties.

The social and economic effects associated with ongoing activities by RD 1000 and Natomas Mutual would not change relative to current conditions. Therefore, the potential social and economic impacts associated with these activities are not discussed further in this section.

This section also addresses the issue of environmental justice. Pursuant to Executive Order 12898 (February 11, 1994), the environmental and human-health effects of a project on minority and low-income communities must be considered in federal decisionmaking. In accordance with the requirements of Executive Order 12898, an environmental-justice impact would occur if minority or low-income communities were subjected to disproportionately high and adverse environmental effects, or if minority and low-income populations were not granted an opportunity to participate in the public review process.

As discussed in Section 4.1.3, the covered activities associated with the Proposed Action have been analyzed in previous environmental documents, and the collective findings of the previous analysis for socioeconomics are briefly summarized here and in Appendix C to provide context for the action being evaluated in this EIR/EIS (See Chapter 2: Proposed Action and Alternatives). (Also see Section 4.1.3 for a list of environmental review documents applicable to the permittees' covered activities and the location at which they are available for review.)

The City Council of the City of Sacramento determined that no potentially significant impacts to population, employment, and housing would occur as a result of implementing the North and South Natomas Community Plans.

4.7.1 Proposed Action

4.7.1.1 Impacts With Participation by All Permittees

Implementation of the Proposed Action would result in the creation of 8,750 acres of habitat reserves, based on 17,500 acres of development and a 0.5:1 mitigation ratio. Habitat reserves would be located in the Natomas Basin and other nearby areas that are productive farmlands. As discussed in Section 4.6, a portion of the habitat reserves would remain in agricultural production (e.g., lands remaining in rice production, Swainson's hawk foraging areas), but a substantial amount of reserve lands would be converted to managed marsh or upland habitat areas. For this analysis, it is assumed that at least 2,187.5 acres would converted to nonagricultural use (representing acreage converted to managed marsh reserves).

Social Conditions

In 1999, there were 3,500 and 4,800 agricultural workers in Sacramento County and Sutter County, respectively (California Employment Development Department, 2001). The loss of up to 2,187.5 acres of farmlands in the two counties under the Proposed Action is expected to result in the direct loss of about 35 agricultural jobs. The 35 jobs were derived by multiplying employment per acre by the number of acres that are expected to go out of production as a result of the creation of habitat reserves. Assuming that there are three nonagricultural jobs for every agricultural job, the indirect labor loss would be 105 jobs. The combined direct and indirect labor loss in the two counties is 140, or about 1.7 percent of the total 1999 agricultural labor workforce of 8,300. Assuming that one-half of the reserves are located in each county, the total direct and indirect labor loss per county equates to 70 jobs in Sacramento County (2 percent of the Sacramento County agricultural workforce) and 70 jobs in Sutter County (about 1.5 percent of the Sutter County agricultural workforce). This reduction in agricultural employment is not significant because it: (1) does not result in a significant decrease in the agricultural employment sector in the two counties, and

(2) would be offset by the projected continued improvement in the overall labor market conditions in both counties resulting from the planned urban development (i.e., the land use agencies' covered activities).

Potential employment benefits associated with the Proposed Action are expected to be minor. Because a substantial amount of the reserve lands would be converted to managed marsh and upland habitat areas, and because the labor demands on such areas are typically low, the creation of the habitat reserves is not expected to result in more than several minimum-wage to low-wage jobs.

The projected loss of jobs would occur throughout the agricultural sector, including farm workers and businesses dependent on agricultural production. There would not be a disproportionate effect on any one component of the agricultural sector and, therefore, the Proposed Action would not disproportionately affect minority or low-income workers. Additionally, new employment would be generated in the Natomas Basin because of new commercial and industrial development that would occur as covered activities under the HCP. Accordingly, environmental justice impacts would be less than significant.

Economic Conditions

Of the 8,750 acres needed for habitat creation in the two counties, it is assumed that 2,187.5 acres would be converted from agricultural use to habitat reserves. The current agricultural production activities on the 2,187.5 acres are primarily related to rice (both for consumption and seed) and several other crops. Assuming that all agricultural production is lost on the 2,187.5 acres, Sacramento and Sutter Counties together are likely to lose between $900,000 and $1 million in gross production value. The estimated loss is based on the gross production value of rice for consumption and seed (Sacramento County Agricultural Commissioner, 2001) as well as the 5-year average price for the various other crops grown in the basin. The loss in gross agricultural output is about 0.2 percent of the total 1999 agricultural output from the two counties, a figure well within the typical swings in agricultural output and value.

The Conservancy is considering providing hunting opportunities on its reserve lands, which would generate additional revenues (estimated to be approximately $31/acre). This potential economic benefit would partially offset the loss of farm revenues.

Agricultural land is assessed property taxes at one percent of its assessed value in both Sacramento and Sutter Counties. Both counties are expected to lose property-tax revenues as a result of converting agricultural lands currently in production to habitat. Assuming that one-half of the reserve lands are acquired in each county, Sacramento County's share of the estimated 2,187.5 acres that go out of agricultural production under the Proposed Action is 1,094 acres. Assuming that agricultural land sold for the same price in Sacramento County as it did in Sutter County in 2000 (especially land in the same basin), i.e., $2,500 to $2,700 per acre (Korhummel, 2001), Sacramento County is expected to lose about $28,000 in property-tax revenues per year. The loss in property taxes is about 0.04 percent of the 2000 to 2001 secured property tax revenues for the county. Thus, the loss in property tax revenues for Sacramento County is not a significant impact.

Under the Proposed Action, Sutter County's contribution to the 2,187.5 acres that go out of agricultural production would also be 1,094 acres, assuming one-half of the reserve lands

are acquired in Sutter County. Based on the price paid for agricultural land that remained in agricultural production in 2000 (i.e., $2,500 to $2,700 per acre), Sutter County is also expected to lose about $28,000 in property tax revenues per year. The loss in property tax revenues is about 0.6 percent of the 2000-2001 secured property-tax revenues for the county. This loss in property-tax revenues is less than significant because it is likely to be offset by property-tax revenues from the planned development in the basin.

4.7.1.2 Mitigation

No significant impacts were identified; therefore, no mitigation is necessary.

4.7.1.3 Level of Significance After Mitigation

The impact would be less than significant without mitigation.

4.7.2 Alternative 1. Increased Mitigation

Under Alternative 1, the mitigation ratio for developed land would be increased from 0.5:1 to 1:1. The development limit would remain at 17,500 acres, but this amount of development would result in the need to acquire 17,500 acres of mitigation land. As discussed previously for the Proposed Action, the mitigation requirement would not be based on the habitat value of the land developed, and the land would be acquired within the Natomas Basin from willing sellers or outside of the basin subject to the 20 percent limitation prescribed in the HCP. All other components of the Proposed Action (e.g., land acquisition and management, canal and ditch maintenance) would not change under Alternative 1. The requirement for one contiguous block of 2,500 acres would not change, and other reserve lands would be acquired to ensure that they form 400-acre contiguous blocks. For this analysis, it is assumed that at least 4,375 acres would be converted to nonagricultural use (representing acreage converted to managed marsh reserves).

4.7.2.1 Impacts With Participation by All Permittees

Social Conditions

The types of social impacts of implementing Alternative 1 would be similar to the Proposed Action, but at approximately double the level. Assuming that 4,375 acres are converted from agriculture to habitat reserves, total direct and indirect employment impacts in Sacramento and Sutter Counties would be about 275 jobs. This represents about 3.3 percent of the total agricultural workforce in the two counties. Assuming that one-half of the reserves are located in each county, the total direct and indirect labor loss per county equates to 138 jobs in Sacramento County (about 3.9 percent of the Sacramento County agricultural workforce) and 138 jobs in Sutter County (about 2.9 percent of the Sutter County agricultural workforce). This reduction in agricultural employment is not significant since (1) it does not result in a significant decrease in the agricultural employment sector in the two counties, and (2) it would be offset by the projected continued improvement in the overall labor-market conditions in both counties associated with the projected development.

Potential employment benefits resulting from implementation of the Proposed Action are expected to be minor. Because a substantial amount of the reserve lands would be converted to managed marsh and upland habitat areas and the labor demands on such areas are typically low, the creation of the habitat reserves is not expected to result in more than a couple of minimum- to low-wage jobs.

Similar to the Proposed Action, environmental justice impacts would be less than significant for the reasons described in Section 4.7.1.1.

Economic Conditions

The types of economic impacts of implementing Alternative 1 would be similar to the Proposed Action, but at approximately double the level. Assuming that all agricultural production is lost on the 4,375 acres converted to habitat reserves, Sacramento and Sutter Counties together are likely to lose between $1.8 million and $2 million in gross production value. The loss in gross agricultural output is about 0.3 percent of the total 1999 agricultural output from the two counties, a figure well within the typical swings in agricultural output and value.

The Conservancy is considering providing hunting opportunities on its reserve lands, which would generate additional revenues (estimated to be approximately $31/acre). This potential economic benefit would partially offset the loss of farm revenues.

Loss of property tax revenues under Alternative 1 are expected to be roughly double the losses under the Proposed Action. Assuming that one-half of the reserve lands are acquired in each county, Sacramento County's share of the estimated 4,375 acres that go out of agricultural production under the Proposed Action is 2,187.5 acres. Assuming that agricultural land sold for the same price in Sacramento County as it did in Sutter County in 2000 (i.e., $2,500 to $2,700 per acre; Korhummel, 2001), Sacramento County is expected to lose about $56,000 per year in property-tax revenues. The loss in property taxes is about 0.08 percent of the 2000-2001 secured property-tax revenues for the county. Thus, the loss in property-tax revenues for Sacramento County is not a significant impact.

Under the Proposed Action, Sutter County's contribution to the 4,375 acres that go out of agricultural production would also be 2,187.5 acres, assuming one-half of the reserve lands are acquired in Sutter County. Based on the price paid for agricultural land that remained in agricultural production in 2000 (i.e., $2,500 to $2,700 per acre), Sutter County is also expected to lose about $56,000 in property tax revenues. The loss in property-tax revenues is about 1.1 percent of the 2000-2001 secured property-tax revenues for the county. This loss in property tax revenues is less than significant because it is likely to be offset by property-tax revenues from new developments in the basin.

4.7.2.2 Mitigation

No significant impacts have been identified; therefore, no mitigation is necessary.

4.7.2.3 Level of Significance After Mitigation

The impact would be less than significant without mitigation.

4.7.3 Alternative 2. Habitat-based Mitigation

Implementation of Alternative 2 would require the acquisition of 17,763 acres of land for mitigation pursuant to the habitat-based mitigation ratios described in Section 2.6.2. Because the mitigation acreage under Alternative 2 would be approximately the same as under Alternative 1, potential social and economic impacts as a result of implementing a habitat-based mitigation alternative would be approximately the same as described above for Alternative 1.

4.7.4 Alternative 3. Reserve Zones

Alternative 3 focuses the acquisition of habitat reserves of specific zones within the Natomas Basin based on giant garter snake and Swainson's hawk habitat availability. The acreage to be acquired and all other implementation requirements would be the same as the Proposed Action. Therefore, potential social and economic impacts as a result of implementing the Reserve Zone Alternative would be the same as under the Proposed Action.

4.7.5 Alternative 4. Reduced Potential for Incidental Take

Development of 12,000 acres under Alternative 4 would result in the acquisition of 6,000 acres of habitat reserves, based on a 0.5:1 mitigation ratio. Compared with the Proposed Action , implementing Alternative 4 would result in less land being conserved as habitat reserves (6,000 acres under Alternative 4 versus 8,750 acres under the Proposed Action). Potential impacts to socioeconomic conditions would remain similar (less than significant) to the Proposed Action.

4.7.6 Alternative 5. No Action Alternative

Establishment of the habitat reserve system envisioned under the Proposed Action and the other alternatives would not occur under the No Action Alternative. As discussed in Section 2.6.5, planned land development and the associated mitigation for biological resources impacts would still occur, however, and it is expected that such mitigation would require active habitat restoration efforts resulting in similar effects as described above for the Proposed Action and the other alternatives.

Under the No Action Alternative, RD 1000 and Natomas Mutual would continue their activities consistent with current practices, with no substantial change relative to the Proposed Action or the other alternatives. Management of habitat reserves by the Conservancy would still be required, resulting in similar impacts as under the Proposed Action and other alternatives.

The Proposed Action and alternatives are expected to have similar effects as the No Action Alternative, and impacts would be less than significant relative to the No Action Alternative baseline.

4.7.7 Effects Under Independent Implementation

As discussed above, significant adverse social and economic effects are not anticipated to occur with implementation by all permittees because the benefits attributable to urban development would be greater than the impacts from loss of agricultural employment. Under independent implementation by either the City or Sutter County, the social and economic effects described above (i.e., loss of jobs, farm revenues, and property taxes) would be proportionally reduced if the City or Sutter County did not participate in implementing the HCP, but the impact would remain less than significant. If the water agencies were the sole participants, there would be no adverse socioeconomic impact because the water agencies' covered activities would not differ from existing operations for canals and drainage areas. If the Conservancy were to implement the HCP independently, no adverse socioeconomic impacts would occur because the conservancy would continue to manage existing reserves.

4.7.8 Cumulative Impacts

Cumulative impacts would include the additional effects associated with the implementation of other regional conservation activities (see Section 4.1.2). Conversion of other lands for habitat management purposes would remove lands from agricultural production, resulting in similar types of social and economic effects as anticipated to occur with implementation of the Proposed Action (e.g., loss of farm production and jobs). The additional impacts associated with other habitat conservation activities would affect site-specific social and economic conditions, but would not further affect socioeconomic conditions in the study area because these activities would not occur in the Natomas Basin or Area B. Therefore, cumulative impacts would not occur.

4.8 Traffic

This section evaluates the impacts of the Proposed Action and the alternatives on traffic conditions. The Proposed Action would have a significant impact on traffic levels if it were to:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system
- Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)

The analysis in this section concludes that, depending on the location of the habitat reserves, minor traffic safety impacts could occur resulting from the movement of construction equipment during reserve-development activities. These impacts would be similar to other types of development activities, and therefore standard traffic safety mitigation requirements should be implemented, if warranted on a case-by-case basis, to reduce potential impacts to a less-than-significant level.

On an ongoing basis, the public could encounter maintenance equipment conducting activities on the canals and drains (RD 1000 and Natomas Mutual), or on the habitat reserves (Conservancy). In addition, the public could encounter farm vehicle equipment on public roads for those sites being managed as rice fields. Potential impacts could include increased delays or risk of accidents resulting from slow-moving farm equipment on the roadways. These activities, however, would be about the same as current conditions. Therefore, the potential traffic impacts associated with RD 1000's and Natomas Mutual's activities, and associated with Conservancy operations, are not discussed further in this section.

As discussed in Section 4.1.3, the covered activities associated with the Proposed Action have been analyzed in previous environmental documents, and the collective findings of the previous analysis for traffic are briefly summarized here and in Appendix C to provide context for the action being evaluated in this EIR/EIS (See Chapter 2: Proposed Action and Alternatives). (Also see Section 4.1.3 for a list of environmental review documents applicable to the permittees' covered activities and the location at which they are available for review.)

The City has identified that increased congestion would occur in North and South Natomas as a result of implementing the planned development, as discussed in the North and South Natomas Community Plans. As described in the Draft EIR for the South Natomas

Community Plan and the Draft Supplemental EIR for the North Natomas Community Plan, some traffic impacts attributable to covered activities can be mitigated to less-than-significant levels through road widening (e.g., East Commerce Boulevard and Truxel Road, and portions of I-5 and I-80), mass transit, and the unique land-use plan proposed for North Natomas. Some roadways in Natomas cannot have traffic impacts reduced to less-than-significant levels because of engineering constraints or the need to displace existing development, including portions of I-5 and I-80, Truxel Road south of Gateway Park Boulevard, West El Camino Avenue, Garden Highway, Northgate Boulevard, and the Arden-Garden Connector.

Sutter County has concluded, in its General Plan EIR, that several of the major roadways within the Sutter County portion of the study area are projected to be congested by 2015 unless improvements are made (Sutter County, 1996c). Accordingly, Riego Road, Sankey Road, Natomas Road, Howsley Road, and Pleasant Grove Road are to be expanded to four-lane thoroughfares, and Garden Highway will be upgraded to a two-lane urban roadway. Sutter County expects that improvements to these roadways would result in an acceptable level of service. An interchange is planned at Riego Road and S.R. 99/70, and S.R. 99/70 may be widened to six lanes south of Riego Road. In addition, a new east-west expressway (Placer Parkway) is currently under consideration that would link S.R. 99/70 to S.R. 65 in Placer County. This expressway would cross the Industrial/Commercial Reserve, ending at a new intersection with S.R. 99/70 in Sutter County.

In addition to an increased demand on roadways, Sutter County will likely experience an increased demand for public transit, rail, and bikeway transportation. Future development is expected to be required to consider providing these services at the discretion of the transit authority (i.e., Yuba-Sutter Transit) in accordance with the implementation of transportation-related policies for the General Plan.

4.8.1 Proposed Action

4.8.1.1 Impacts With Participation by All Permittees

Implementation of the Proposed Action would result in 8,750 acres of habitat reserves, based on development of 17,500 acres and a 0.5:1 mitigation ratio. Habitat reserves would be established subject to the provisions of the HCP, including the requirements for one 2,500-acre contiguous reserve, 400-acre minimum reserve sizes, and not more than 20 percent of reserves allowed outside of the Natomas Basin. Impacts to traffic and circulation (e.g., public-safety hazards and other construction-related nuisances) could occur during reserve development. This would include the increased potential for vehicles traveling on local roadways to encounter construction equipment, temporary open trenches during grading and backfilling, and other construction site hazards. Nuisances that the public could encounter include localized congestion, delays, lane closures, and detours in the immediate vicinity of parcels undergoing site restoration. The extent of the construction activities (estimated to be about 25 percent of the total mitigation requirement, or 2,187.5 acres, based on the amount of managed marsh to be created) would be dispersed over a period of many years and over several construction sites, depending on the rate at which urban land is developed, reserve land is acquired, and habitat reserves are created.

For many local roadways (e.g., Powerline Road, east-west roads west of S.R. 99/70, Area B), it is not expected that public safety or nuisance impacts would occur given the low levels of traffic. Some local roadways (such as Elverta Road and Riego Road east of S.R. 99/70), however, currently experience high levels of traffic because they link the S.R. 99/70 corridor with Rio Linda, Roseville, and other areas in northeastern Sacramento. Heavy construction activity associated with reserve development along these roadways could result in traffic impacts as described above.

4.8.1.2 Mitigation

Traffic levels on local roadways could change over the permit term and, therefore, it is difficult to predict the specific areas where reserve development might contribute to traffic safety impacts. The following mitigation measure, however, is recommended to address the potential for traffic safety impacts and minimize the potential for impacts.

- Prior to commencing substantial habitat reserve development activities, the Conservancy shall evaluate traffic levels on any adjacent rural roadways that would provide construction access. Where potential traffic-safety impacts are identified, the Conservancy and/or its contractor shall prepare a Traffic Control Plan that addresses potential impacts to public safety and other construction-related nuisances. The Traffic Control Plan shall be reviewed and approved by the City of Sacramento and/or Sutter County, and should be submitted for review by Sacramento County for projects located within the unincorporated portion of Sacramento County. Traffic management measures to be included in the Traffic Control Plan include, but are not limited to, the following:

  – Provide adequate warning to users of the roadway in the vicinity of the construction, through signs or other means visible from the roadway

  – Provide adequate assistance to the public in navigating the construction site through the use of flagmen

  – Install adequate signage for construction zones and detours

  – If traffic and circulation would be interrupted for an extended period of time, provide for the opportunity for public input from affected residents

4.8.1.3 Level of Significance After Mitigation

With the implementation of this mitigation measure, potential traffic-related impacts would be less than significant.

4.8.2 Alternative 1. Increased Mitigation

Under Alternative 1, the mitigation ratio for developed land would be increased from 0.5:1 to 1:1. The development limit for the City, Metro Air Park, and Sutter County would remain at 17,500 acres, but this amount of development would result in the need to acquire 17,500 acres of mitigation land. As discussed previously for the Proposed Action, the mitigation requirement would not be based on the habitat value of the land developed, and the land would be acquired within the Natomas Basin from willing sellers or outside of the basin subject to the 20 percent limitation prescribed in the HCP. All other components of the Proposed Action (e.g., land acquisition and management, canal and ditch maintenance)

would not change under Alternative 1. The requirement for one contiguous block of 2,500 acres would not change, and other reserve lands would be acquired to ensure that they form 400-acre contiguous blocks.

4.8.2.1 Impacts With Participation by All Permittees

Potential impacts to traffic and circulation are similar to those discussed above for the Proposed Action. Although increasing the amount of habitat reserves created could increase the potential for traffic-safety hazards, substantial hazards are not expected given the low levels of traffic on local roadways. In addition, the extent of the construction activities (estimated to be about 25 percent of the total mitigation requirement, or 4,375 acres, based on the amount of managed marsh to be created) would be dispersed over a period of many years and over several construction sites. Similar to the Proposed Action, however, the potential exists for the impact to be significant.

4.8.2.2 Mitigation

Implement the mitigation measure stated in Section 4.8.1.2.

4.8.2.3 Level of Significance After Mitigation

With the implementation of this mitigation measure, potential traffic-related impacts would be less than significant.

4.8.3 Alternative 2. Habitat-based Mitigation

Implementation of Alternative 2 would require the acquisition of 17,763 acres of land for mitigation pursuant to the habitat-based mitigation ratios described in Section 2.6.2. Because the mitigation acreage under Alternative 2 would be approximately the same as under Alternative 1, potential traffic-safety impacts as a result of implementing a habitat-based mitigation alternative would be approximately the same as described above for Alternative 1. Accordingly, implementing the mitigation measure described under the Proposed Action (Section 4.8.1.2) is recommended for Alternative 2 as well.

4.8.4 Alternative 3. Reserve Zones

Alternative 3 focuses the acquisition of habitat reserves of specific zones within the Natomas Basin based on giant garter snake and Swainson's hawk habitat availability. The acreage to be acquired and all other implementation requirements would be the same as the Proposed Action. Therefore, potential traffic-safety impacts as a result of implementing the Reserve Zone Alternative would be the same as under the Proposed Action. Implementing the mitigation measure described under the Proposed Action (Section 4.8.1.2) is recommended for Alternative 3 as well.

4.8.5 Alternative 4. Reduced Potential for Incidental Take

Development of 12,000 acres under Alternative 4 would result in the acquisition of 6,000 acres of habitat reserves, based on a 0.5:1 mitigation ratio. Compared with the Proposed Action , implementing Alternative 4 would result in less land being conserved as habitat reserves (6,000 acres under Alternative 4 versus 8,750 acres under the Proposed Action). Potential traffic-safety impacts would remain similar to, but slightly less than, the

Proposed Action. The potential for impacts to traffic safety, although reduced relative to the Proposed Action, warrants mitigation (see Section 4.8.1.2) because of the extent of reserve development activities.

4.8.6 Alternative 5. No Action Alternative

Establishment of the habitat reserve system envisioned under the Proposed Action and the other alternatives would not occur under the No Action Alternative. As discussed in Section 2.6.5, land development and the associated mitigation for biological resources impacts would still occur, however, and it is expected that such mitigation would require active habitat restoration efforts resulting in similar effects as described above for the Proposed Action and the other alternatives. These activities would be similar to current land-management practices in the Natomas Basin and similar habitat areas, and are not expected to result in substantially different impacts relative to current conditions. The mitigation measures described in Section 4.8.1.2 would likely be required as a result of CEQA review during these individual habitat-conservation activities.

Under the No Action Alternative, RD 1000 and Natomas Mutual would continue their activities consistent with current practices, with no substantial change relative to the Proposed Action or the other alternatives. Management of habitat reserves by the Conservancy would still be required, resulting in similar impacts as under the Proposed Action and other alternatives.

The Proposed Action and alternatives are expected to have similar effects as the No Action Alternative, and impacts would therefore be less than significant relative to the No Action Alternative baseline.

4.8.7 Effects Under Independent Implementation

Under independent implementation, potential impacts to traffic and circulation would be similar to those discussed above for the overall impact of participation by all applicants because the traffic impacts that would occur would be those related to creation of habitat reserves. If only the City or Sutter County participated, the Conservancy would still construct reserves (although the acreage of the reserve area would be less than the acreage that would be realized under full participation of both the City and Sutter County). In addition, with implementation of the proposed mitigation measures (see Section 4.8.1.2), impacts would be less than significant if only the City or Sutter County participated. If any one of the individual permittees were to participate independent of all other permittees, the impacts would remain less than significant because the mitigation would be conducted by the Conservancy and the appropriate land use agency would approve the mitigation plan.

4.8.8 Cumulative Impacts

Cumulative impacts would include the additional effects associated with the implementation of other regional conservation activities (see Section 4.1.2). Potential traffic impacts associated with development in these local project areas would be similar to the effects described above in Section 4.8.1.1 (e.g., public-safety hazards and other construction-related nuisances). Impacts associated with other habitat-conservation activities could affect traffic conditions in the local project area, but would not further impact traffic conditions in

the study area because these activities would not occur in the Natomas Basin or Area B. Therefore, cumulative impacts would not occur.

4.9 Noise

This section evaluates the impacts of the Proposed Action and alternatives on noise levels in the study area. For purposes of this analysis, noise-generating activities associated with the Proposed Action and alternatives consist primarily of operating construction equipment during reserve development.

The Proposed Action would have a significant impact on noise levels if it were to result in:

- A substantial temporary or periodic increase in ambient noise levels in the study area vicinity above levels existing without implementation of the Proposed Action

The analysis in this section concludes that minor noise impacts could occur resulting from the activities of heavy construction equipment during the creation of managed marshes and other restored natural areas on the habitat reserves. These impacts would be similar to other types of development activities, and therefore standard noise control requirements are recommended to reduce potential impacts to a less-than-significant level.

On an ongoing basis, the public could experience noise impacts resulting from activities on the canals and drains (RD 1000 and Natomas Mutual), or on the habitat reserves (Conservancy). In addition, the public could experience noise from farm equipment on those reserve areas being managed as rice fields. Noise levels occurring as a result of these activities, however, would be about the same as current conditions. Therefore, the potential noise impacts associated with RD 1000 and Natomas Mutual activities, and associated with Conservancy operations, are not discussed further in this section.

As discussed in Section 4.1.3, the covered activities associated with the Proposed Action have been analyzed in previous environmental documents, and the collective findings of the previous analysis for noise are briefly summarized here and in Appendix C to provide context for the action being evaluated in this EIR/EIS (See Chapter 2: Proposed Action and Alternatives). (Also see Section 4.1.3 for a list of environmental review documents applicable to the permittees' covered activities and the location at which they are available for review.)

As described in the EIRs for the North and South Natomas Community Plans, future noise levels from implementation of the Proposed Action's covered activities (urban development) within the City would increase to significantly adverse levels along roadways. Exterior noise levels are likely to remain at significantly adverse levels unless mitigation is approved. Under these conditions, new residential projects would be required to prepare acoustical reports to determine appropriate site-specific development, proper site planning and architectural layout, noise barriers, and construction modifications.

As described in the Sutter County General Plan EIR, Sutter County expects that noise levels along some major roadways in the Sutter County portion of the study area would increase to levels that will have a significant impact on the ambient noise environment and would require mitigation. Mitigation for traffic-related noise impacts includes not allowing noise-sensitive development near major roadways, project-specific mitigation for new transportation sources, and preparation of acoustical reports for new non residential development to determine the appropriateness of project-specific mitigation.

The industrial activities to be developed within the Industrial-Commercial Reserve area could generate significant noise levels. Specific mitigation for the development of this area is not provided in the EIR for the Sutter County General Plan because of the inability to meaningfully quantify development possibilities and site design. New development in this area will undergo project-specific review processes to mitigate noise levels in excess of acceptable County noise standards.

4.9.1 Proposed Action

4.9.1.1 Impacts With Participation by All Permittees

Implementation of the Proposed Action by the City, Metro Air Park, and Sutter County would result in the need to establish 8,750 acres of habitat reserves, based on a 0.5:1 mitigation ratio. Habitat reserves would be established subject to the provisions of the HCP, including the requirements for one 2,500-acre contiguous reserve, 400-acre minimum reserve sizes, and not more than 20 percent of reserves allowed outside of the Natomas Basin. Construction activities (estimated to be about 25 percent of the total mitigation requirement, or 2,187.5 acres, based on the amount of managed marsh to be created) would be dispersed over a period of many years and over several construction sites. The substantial construction activities associated with development of habitat reserves would increase ambient noise conditions within the study area. Because of the generally rural character of much of the Natomas Basin and Area B, it is not expected that sensitive receptors (e.g., residences) would be located near the construction areas. Accordingly, noise impacts are not likely to occur in these areas. Although much of the study area is rural in character, sensitive receptors are located in several areas (e.g., Rio Ramaza, Nicolaus, Trowbridge) and farmhouses are distributed throughout the study area. Heavy construction activity associated with reserve development in these areas could result in noise impacts to sensitive receptors.

4.9.1.2 Mitigation

Because specific habitat reserve lands are not identified, it is difficult to predict the specific areas where reserve development might contribute to high noise levels. The following mitigation measure, however, is recommended to address the potential for noise impacts and reduce the potential for impacts.

> Prior to commencing substantial habitat reserve development activities, the Conservancy shall determine if residences or other sensitive receptors are located within 1000 feet of the construction site. If sensitive receptors are located within 1000 feet of the construction site, operation of construction equipment and vehicles would occur between the hours of 7:00 am and 6:00 pm, Monday through Saturday, and between 9:00 am and 6:00 pm on Sunday.

4.9.1.3 Level of Significance After Mitigation

With the implementation of this mitigation measure, potential noise impacts would be less than significant.

4.9.2 Alternative 1. Increased Mitigation

Under Alternative 1, the mitigation ratio for developed land would be increased from 0.5:1 to 1:1. The development limit for the City, Metro Air Park, and Sutter County would remain at 17,500 acres, but this amount of development would result in the need to acquire 17,500 acres of mitigation land. As discussed previously for the Proposed Action, the mitigation requirement would not be based on the habitat value of the land developed, and the land would be acquired within the Natomas Basin from willing sellers or outside of the basin subject to the 20 percent limitation prescribed in the HCP. All other components of the Proposed Action (e.g., land acquisition and management, canal and ditch maintenance) would not change under Alternative 1. The requirement for one contiguous block of 2,500 acres would not change, and other reserve lands would be acquired to ensure that they form 400-acre contiguous blocks.

4.9.2.1 Impacts With Participation by All Permittees

Temporary increases in noise levels in association with an increased mitigation ratio of 1:1 for Alternative 1 would occur in a manner similar to the Proposed Action. Impacts include temporary increases in noise because of the operation of construction equipment for site preparation. Although increasing the amount of habitat reserves created could increase the potential for noise impacts, substantial impacts are not expected given the generally low ambient noise conditions in the undeveloped study area. In addition, the extent of the construction activities (estimated to be about 25 percent of the total mitigation requirement, or 4,375 acres, based on the amount of managed marsh to be created) would be dispersed over a period of many years and over several construction sites. Similar to the Proposed Action, however, the potential exists for the impact to be significant.

4.9.2.2 Mitigation

Implement the mitigation measure stated in Section 4.9.1.2.

4.9.2.3 Level of Significance After Mitigation

With the implementation of this mitigation measure, potential noise impacts would be less than significant.

4.9.3 Alternative 2. Habitat-based Mitigation

Implementation of Alternative 2 would require the acquisition of 17,763 acres of land for mitigation pursuant to the habitat-based mitigation ratios described in Section 2.6.2. Because the mitigation acreage under Alternative 2 would be approximately the same as under Alternative 1, potential noise impacts as a result of implementing a habitat-based mitigation alternative would be approximately the same as described above for Alternative 1. Accordingly, implementing the mitigation measure described under the Proposed Action (Section 4.9.1.2) is recommended for Alternative 2 as well.

4.9.4 Alternative 3. Reserve Zones

Alternative 3 focuses on the acquisition of habitat reserves of specific zones within the Natomas Basin, based on giant garter snake and Swainson's hawk habitat availability. The acreage to be acquired and all other implementation requirements would be the same as the

Proposed Action. Therefore, potential noise impacts as a result of implementing the Reserve Zone Alternative would be the same as under the Proposed Action. Implementing the mitigation measure described under the Proposed Action (Section 4.9.1.2) is recommended for Alternative 2 as well.

4.9.5 Alternative 4. Reduced Potential for Incidental Take

Development of 12,000 acres under Alternative 4 would result in the acquisition of 6,000 acres of habitat reserves, based on a 0.5:1 mitigation ratio. Compared with the Proposed Action , implementing Alternative 4 would result in less land being conserved as habitat reserves (6,000 acres under Alternative 4 versus 8,750 acres under the Proposed Action). Potential noise impacts would remain similar to, but slightly less than, the Proposed Action. Potential noise impacts, although reduced relative to the Proposed Action, warrant the adoption of a mitigation measure (see Section 4.9.1.2) because of the extent of reserve-development activities.

4.9.6 Alternative 5. No Action Alternative

Establishment of the habitat reserve system envisioned under the Proposed Action and the other alternatives would not occur under the No Action Alternative. As discussed in Section 2.6.5, planned land development and the associated mitigation for biological-resources impacts would still occur, however, and it is expected that such mitigation would require active habitat restoration efforts resulting in similar effects as described above for the Proposed Action and the other alternatives. These activities would be similar to current land-management practices in the Natomas Basin and similar habitat areas, and are not expected to result in substantially different impacts relative to current conditions. The mitigation measures described in Section 4.9.1.2 would likely be required as a result of CEQA review during these individual habitat-conservation activities.

Under the No Action Alternative, RD 1000 and Natomas Mutual would continue their activities consistent with current practices, with no substantial change relative to the Proposed Action or the other alternatives. Management of habitat reserves by the Conservancy would still be required, resulting in similar impacts as under the Proposed Action and other alternatives.

The Proposed Action and alternatives are expected to have similar effects as the No Action Alternative, and impacts would therefore be less than significant relative to the No Action Alternative baseline.

4.9.7 Effects Under Independent Implementation

Potential noise impacts with limited participation would be similar to the overall impacts discussed above for implementation by all permittees. The portion of potential impacts that the City or Sutter County would contribute would be less than, but similar to, the overall impact. The portion of potential impacts that the City or Sutter County would contribute would be less than significant if the mitigation measure described in Section 4.9.1.2 was implemented.

4.9.8 Cumulative Impacts

Cumulative impacts would include the additional effects associated with the implementation of other regional conservation activities (see Section 4.1.2). Potential noise impacts in this area would be similar to the effects described above in Section 4.9.1.1 (e.g., construction-related nuisances). Cumulative impacts resulting from the implementation of the Proposed Action, in combination with other cumulative actions, would not occur because noise impacts are localized. Therefore, noise impacts attributable to the Proposed Action would be isolated to the Proposed Action's defined area of study.

4.10 Air Quality

This section presents a summary of potential air-quality impacts associated with implementation of the Proposed Action or the other alternatives. For this Proposed Action, air-quality impacts would be limited to potential construction-equipment emissions and dust generation that would occur on a temporary basis during grading and earth-moving activities on the habitat reserves. The Proposed Action would have a significant impact if it would:

- Conflict with or obstruct implementation of applicable air quality plans
- Violate any air-quality standard or contribute substantially to an existing or projected air-quality violation

The analysis in this section concludes that minor air-quality impacts could occur, resulting from the activities of heavy construction equipment during the creation of managed marshes on the habitat reserve areas. These impacts would be similar to other types of development activities, and therefore standard emissions- and dust-control requirements are recommended to reduce potential impacts to a less-than-significant level.

On an ongoing basis, activities that affect air quality would continue to occur, resulting from activities on the canals and drains (RD 1000 and Natomas Mutual) and on the habitat reserves (Conservancy), including the ongoing management of rice fields. Air-quality impacts occurring as a result of these activities, however, would be about the same as current conditions. Therefore, the potential air-quality impacts associated with RD 1000's and Natomas Mutual's activities, and associated with Conservancy operations, are not discussed further in this section.

As discussed in Section 4.1.3, the covered activities associated with the Proposed Action have been analyzed in previous environmental documents, and the collective findings of the previous analysis for air quality are briefly summarized here and in Appendix C to provide context for the action being evaluated in this EIR/EIS (See Chapter 2: Proposed Action and Alternatives). (Also see Section 4.1.3 for a list of environmental review documents applicable to the permittees' covered activities and the location at which they are available for review.)

Both the City Council of the City of Sacramento and the Sutter County Board of Supervisors determined that the regional air-quality impacts of urbanization would be significant and unavoidable, and each adopted Statements of Overriding Considerations pursuant to

CEQA. Mitigation measures were adopted to minimize the extent of air-quality impacts, but the impacts could not be mitigated to a less-than-significant level.

4.10.1 Proposed Action

4.10.1.1 Impacts With Participation by All Permittees

Implementation of the Proposed Action would result in the need to establish 8,750 acres of habitat reserves, based on a 0.5:1 mitigation ratio. Habitat reserves would be established subject to the provisions of the HCP, including the requirements for one 2,500-acre contiguous reserve, 400-acre minimum reserve sizes, and not more than 20 percent of reserves allowed outside of the Natomas Basin. Potential impacts to air quality would be limited to construction activities during site preparation of the habitat reserves. These effects would include an increase in vehicle emissions (e.g., ozone precursors, CO, PM_{10}) and fugitive dust on a temporary basis during earth-moving activities. CO is generally considered to be of primary concern in areas exposed to high concentrations of vehicle exhaust, such as urban intersections. Because these conditions are not present in the areas where habitat reserves would be created, issues associated with pollution concentration (i.e., CO levels) are not considered to be of concern for the Proposed Action.

For construction of the habitat reserves, ozone precursors (NO_x and ROG) would be generated primarily by the operation of vehicles including construction vehicles, generators, and the personal vehicles of construction workers. Approximately 50 percent of reserve lands would remain in rice production, and is not anticipated to be affected by designation as a habitat reserve. Heavy construction activity is expected to occur on a portion of the remaining lands, primarily during conversion of a rice field to a managed marsh system, but also during grading to restore an upland areas to native vegetation. For five of the existing reserve lands, estimates of vehicle use are provided in the Habitat Management Plan (Natomas Basin Conservancy, 2001). This report indicates use of heavy construction equipment in areas that are being converted to managed marsh and uplands. For example, restoration of the Betts-Kismat-Silva parcel would require up to 190,000 cubic yards of material to be moved (5,000 cubic yards a day over about two months). This level of activity would occur as lands are acquired by the Conservancy and converted to habitat, and would likely occur over several years and in several different locations in the Natomas Basin and (potentially) Area B.

Implementation of the Proposed Action would not conflict with the implementation of the Sacramento Area Regional Ozone Attainment Plan, which is a part of the 1994 State Implementation Plan for Ozone under the federal Clean Air Act. This plan describes the control measures that would be implemented regionally to lower ozone precursor levels, and bases its conclusions on baseline information, including assumptions about existing and future land uses. The activities proposed on the habitat reserves are similar to the contouring work undertaken by rice farmers, and an therefore not substantially different than could be expected to occur within the study area without implementation of the Proposed Action. Accordingly, the potential for conflicts with regional air quality attainment plans would be a less-than-significant impact. Because the Sacramento region is a non-attainment area for ozone and PM_{10}, however, additional contributions of these pollutants is a potentially significant effect.

Sensitive receptors, such as schools, hospitals, and retirement and nursing homes would not be subject to substantial pollutant concentrations as a result of implementing the Proposed Action because these uses are not currently located, or planned to be located, in the areas where habitat reserves could be created. Objectionable odors would not be generated as a result of the Proposed Action.

4.10.1.2 Mitigation

Because the Sacramento region is a nonattainment area for ozone and PM_{10}, additional contributions of these pollutants is a potentially significant effect. Accordingly, measures have been identified to reduce or otherwise minimize air-pollution emissions that could occur during creation of the habitat reserves.

The following measures shall be implemented to reduce emissions of ozone precursors during construction activities on the habitat reserves.

- To the extent feasible, the Natomas Basin Conservancy shall work with contractors who include low-NO_x, heavy-duty construction vehicles.
- Construction activities shall be phased to reduce the simultaneous operation of construction equipment.
- The contractor shall perform routine tuning and maintenance of construction equipment.
- The contractor shall use existing on-site electric power sources in place of diesel generators to the extent that these sources are available.

and

The following measures shall be implemented to reduce construction-related emissions of fugitive dust (PM_{10}).

- The contractor shall reduce or suspend grading and excavation activity during windy periods (i.e., winds in excess of 15 miles per hour).
- The contractor shall post and enforce speed limits on unpaved driving areas.
- The contractor shall apply water twice daily to disturbed areas and active construction sites.
- The contractor shall treat completed sites with soil binders or vegetation.
- Dirt shall be washed off trucks and other equipment before leaving the construction site.

4.10.1.3 Level of Significance After Mitigation

Implementation of these mitigation measures would reduce air-quality impacts to a less-than-significant level.

4.10.2 Alternative 1. Increased Mitigation

Under Alternative 1, the mitigation ratio for developed land would be increased from 0.5:1 to 1:1. The development limit for the City, Metro Air Park, and Sutter County would

remain at 17,500 acres, but this amount of development would result in the need to acquire 17,500 acres of mitigation land. As discussed previously for the Proposed Action, the mitigation requirement would not be based on the habitat value of the land developed, and the land would be acquired within the Natomas Basin from willing sellers or outside of the basin subject to the 20 percent limitation prescribed in the HCP. All other components of the Proposed Action (e.g., land acquisition and management, canal and ditch maintenance) would not change under Alternative 1. The requirement for one contiguous block of 2,500 acres would not change, and other reserve lands would be acquired to ensure that they form 400-acre contiguous blocks.

4.10.2.1 Impacts With Participation by All Permittees

Potential impacts to air quality associated with constructing habitat reserves based on a 1:1 mitigation ratio would be similar to the overall impacts (potentially significant) for the Proposed Action, as discussed above. Implementation of Alternative 1 could increase the use of construction equipment as a result of a greater amount of reserves that would be development; however, the implementation of Alternative 1 would not conflict with air quality attainment plans.

4.10.2.2 Mitigation

Implement the mitigation measures stated in Section 4.10.1.2.

4.10.2.3 Level of Significance After Mitigation

Implementation of these mitigation measures would reduce air-quality impacts to a less-than-significant level.

4.10.3 Alternative 2. Habitat-based Mitigation

Implementation of Alternative 2 would require the acquisition of 17,763 acres of land for mitigation pursuant to the habitat-based mitigation ratios described in Section 2.6.2. Because the mitigation acreage under Alternative 2 would be approximately the same as under Alternative 1, potential air-quality impacts as a result of implementing a habitat-based mitigation alternative would be approximately the same as described above for Alternative 1. Accordingly, implementing the mitigation measure described under the Proposed Action (Section 4.10.1.2) is recommended for Alternative 2 as well.

4.10.4 Alternative 3. Reserve Zones

Alternative 3 includes a more strict acquisition criteria than the Proposed Action, but the acreage to be acquired and most other requirements would be the same as the Proposed Action. Therefore, potential air-quality impacts as a result of implementing the Reserve Zone Alternative would be the same as under the Proposed Action. Implementing the mitigation measure described under the Proposed Action (Section 4.10.1.2) is recommended for Alternative 3 as well.

4.10.5 Alternative 4. Reduced Potential for Incidental Take

Development of 12,000 acres under Alternative 4 would result in the acquisition of 6,000 acres of habitat reserves, based on a 0.5:1 mitigation ratio. Compared with the

Proposed Action , implementing Alternative 4 would result in less land being conserved as habitat reserves (6,000 acres under Alternative 4 versus 8,750 acres under the Proposed Action). Air-quality impacts would remain similar to, but slightly less than, the Proposed Action. Potential air-quality impacts, although reduced relative to the Proposed Action, warrant the adoption of the mitigation measures stated in Section 4.10.1.2 because of the extent of reserve-development activities.

4.10.6 Alternative 5. No Action Alternative

Establishment of the habitat reserve system envisioned under the Proposed Action and the other alternatives would not occur under the No Action Alternative. As discussed in Section 2.6.5, planned land development and the associated mitigation for biological-resources impacts would still occur, however, and it is expected that such mitigation would require active habitat restoration efforts resulting in similar effects as described above for the Proposed Action and the other alternatives. These activities would be similar to current land-management practices in the Natomas Basin and similar habitat areas, and are not expected to result in substantially different impacts relative to current conditions. The mitigation measures described in Section 4.5.1.2 would likely be required as a result of CEQA review during these individual habitat conservation activities.

Under the No Action Alternative, RD 1000 and Natomas Mutual would continue their activities consistent with current practices, with no substantial change relative to the Proposed Action or the other alternatives. Management of habitat reserves by the Conservancy would still be required, resulting in similar impacts as under the Proposed Action and other alternatives.

The Proposed Action and alternatives are expected to have similar effects as the No Action Alternative, and impacts would therefore be less than significant relative to the No Action Alternative baseline.

4.10.7 Effects Under Independent Implementation

Potential air-quality impacts with limited participation would be similar to the overall impacts discussed above for implementation by all permittees. The portion of potential impacts that the City or Sutter County would contribute would be less than, but similar to, the overall impact. The portion of potential impacts that the City or Sutter County would contribute would be less than significant if the mitigation measures described in Section 4.10.1.2 above were implemented.

4.10.8 Cumulative Impacts

Cumulative impacts would include the additional effects associated with the implementation of other regional conservation activities (see Section 4.1.2). Potential air-quality impacts in this area would be similar to the effects described above in Section 4.10.1.1 (e.g., dust and ozone-precursor generation). Cumulative impacts resulting from the implementation of the Proposed Action, in combination with other cumulative actions, would not occur because the cumulative actions are characterized by habitat conservation and species preservation. Although localized impacts could occur, they are expected to be short-term and temporary.

4.11 Public Health and Safety

This section describes potential increases in public health-and-safety risks associated with bird strikes at Sacramento International Airport as a result of implementing the Proposed Action or alternatives. Public health- and safety-issues other than bird strikes have not been identified. For potential public health and safety impacts, the Proposed Action would have a significant impact if it would:

- Cause changes in land use patterns such that waterfowl occurrence would be concentrated within a 5-mile radius of Sacramento International Airport runway centerlines (i.e., the FAA General Zone), 2-mile radius of runway centerlines (i.e., the FAA Critical Zone), or 1-mile radius of runway centerlines
- Impair the ability of Sacramento International Airport to implement control techniques identified in its Wildlife Hazard Management Plan

The analysis concludes that potential health-and-safety impacts associated with bird strikes would be less-than-significant because of the similarity of habitat-reserve management with existing land uses. Additionally, the analysis discusses potential waterfowl habitat changes in the Natomas Basin and concludes that the concentration of waterfowl would not substantially change within the safety zones of Sacramento International Airport.

Concerns over wildlife hazards relate to the establishment and management of habitat reserves, and therefore the canal activities of RD 1000 and Natomas Mutual are not considered further in this section.

As discussed in Section 4.1.3, the covered activities associated with the Proposed Action have been analyzed in previous environmental documents and the collective findings of the previous analysis for public health and safety are summarized in Appendix C to provide context for the impacts attributable to covered activities. The specific effect of bird strikes was not evaluated in these prior environmental documents.

4.11.1 Proposed Action

4.11.1.1 Impacts With Participation by All Permittees

Implementation of the Proposed Action would result in the need to establish 8,750 acres of habitat reserves, based on 17,500 acres of development and a 0.5:1 mitigation ratio. Habitat reserves would be established subject to the provisions of the HCP, including the requirements for one 2,500-acre contiguous reserve, 400-acre minimum reserve sizes, and not more than 20 percent of reserves allowed outside of the Natomas Basin. As described in the HCP, the types of habitats created would be 50 percent rice fields, 25 percent managed marsh, and 25 percent uplands.

The types of wildlife with the greatest potential for risk to aircraft operations at Sacramento International Airport are waterfowl, particularly ducks and geese. Flocking by ducks and geese while in flight is considered to have a greater potential for risk to aircraft operations compared to solitary flying behavior. In the Sacramento area, winter is the period of the year with the greatest potential for risk associated with flocking. The 5-mile and 2-mile zones around the airport runways are important zones for safe operation of aircraft based

on FAA requirements. Additionally, the 1-mile north of the runways is also considered a particularly important safety area because the majority of flights into the airport approach from the north (Febbo, pers. comm.). At a 1-mile distance from the airport, aircraft begin to descend at an altitude where the majority of waterfowl fly (2,000 feet or less above ground level). Most of the undeveloped Natomas Basin is within the 5-mile zone, and much of the northwest quadrant of the Natomas Basin (where substantial reserve acquisition is expected) is within the 2- and 1-mile zones (Figure 4-2).

Flooded rice fields and other wetlands in the Natomas Basin provide winter resting, foraging, and loafing habitat for waterfowl, both as winter residents and during migration. In the winter, managed marsh may not be as attractive to waterfowl compared with rice fields, because rice fields could have more food sources than managed marsh. Upland habitat is not as attractive to waterfowl compared with rice fields or managed marsh, because it does not support the most preferable type of environment and food sources used by waterfowl. Based on these generalizations, issues regarding the potential for reserve lands to conflict with Sacramento International Airport can be summarized as follows:

- The location of upland reserves (25 percent, or 2,187.5 acres, under the Proposed Action) is not relevant to public health and safety with regard to Sacramento International Airport because waterfowl use of uplands during the winter is limited.
- The location of managed marsh reserves (25 percent, or 2,187.5 acres, under the Proposed Action) is potentially relevant to the bird strike issue. The requirements for managed marsh reserves necessitate the conversion of nonrice areas to attractive open-water habitat within the areas of primary concern for Sacramento International Airport.

The substantial acreage of rice lands north of Sacramento International Airport and in the general vicinity of the airport is a concern because of the heavy use of flooded rice fields by ducks and geese during the winter.

Because of the soil types in the Natomas Basin, agricultural land use patterns are not expected to substantially change. For example, existing upland areas along the western edge of the Natomas Basin would not be converted to rice fields because of soil composition. The soils in this area would not support rice farming. Likewise, upland reserves would likely not be created in the north-central portion of the Natomas Basin that currently supports heavy rice production. Managed marsh areas could be created in most areas in the basin, but would primarily be created in areas that would support standing water. Based on information available for future habitat-reserve acquisitions within the critical 5-, 2- and 1-mile zones of the airport, implementation of the Proposed Action would not result in land uses that are more attractive to waterfowl compared to current conditions. Under the Proposed Action, many existing rice fields within these zones (including directly north of the airport) would be purchased for future habitat management; however, land uses would not be changed. Accordingly, 50 percent of the required reserve lands (4,375 acres in rice production) would be established with no change in land use relative to current conditions.

Habitat reserves could be acquired in the areas north of the airport and could be converted to managed marsh. Because managed marsh is not likely to attract winter waterfowl more than rice fields, the creation of managed marsh reserves is not expected to alter waterfowl use in

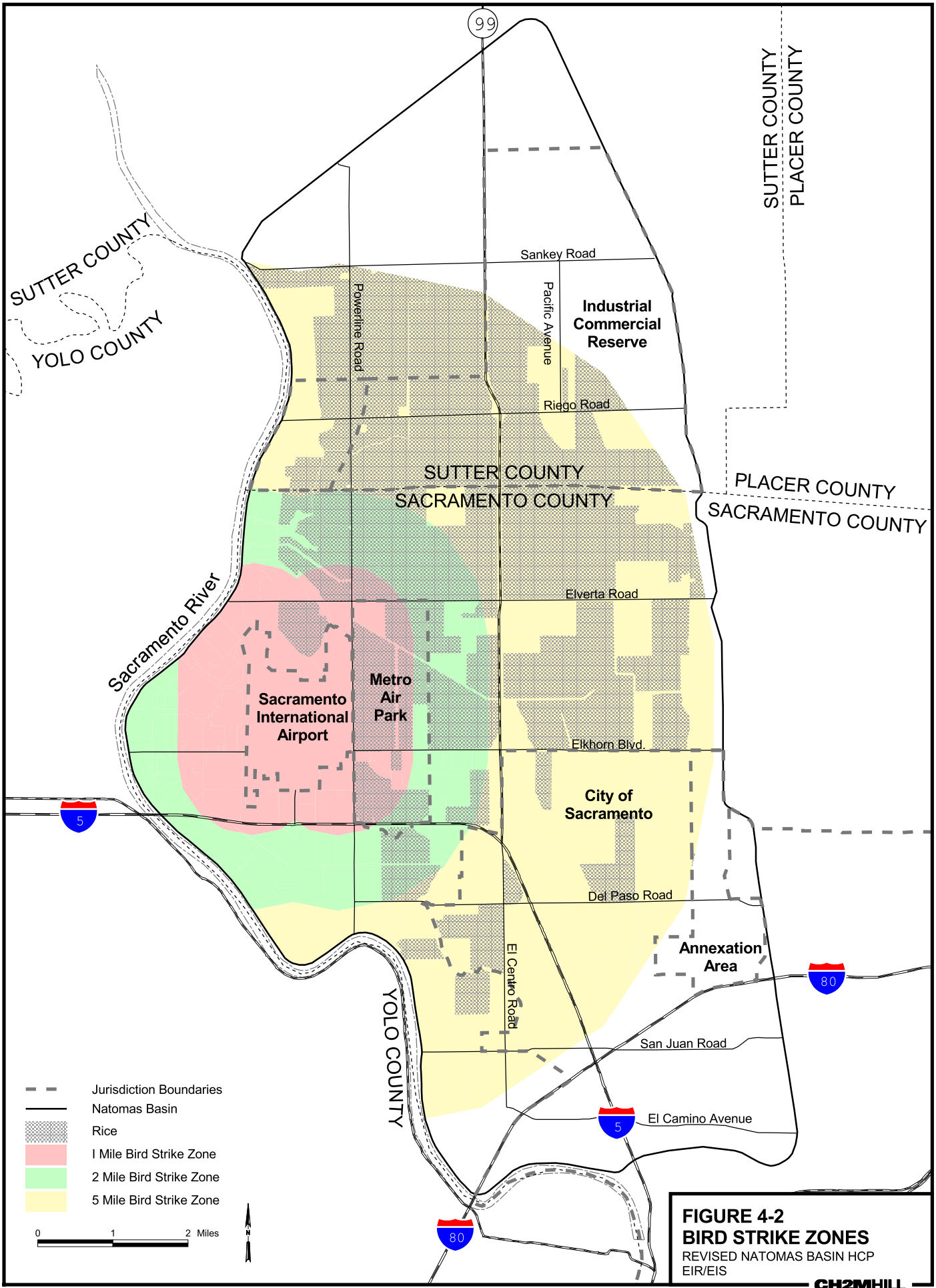

FIGURE 4-2
BIRD STRIKE ZONES
REVISED NATOMAS BASIN HCP
EIR/EIS

CH2MHILL

CH2M Hill RDD ArcView Project File \\Thor\Cart1\rddgis\natomashcp\nat_hcp.apr fig4-2birdsz.pdf 10:22 a.m. 02-22-2002

the area. In addition, management of the rice reserves would remain similar to current management practices, especially with the increase in winter flooding that has occurred in the basin since the early 1990s with the increased restrictions on straw burning. relative to existing conditions and regardless of where the reserves are established, the establishment of rice and managed marsh reserves is not expected to change the potential for bird strikes at Sacramento International Airport.

One notable aspect of the Conservancy's proposed management is the possibility that a waterfowl-hunting program could be established on the reserves. Waterfowl hunting in rice fields and managed marsh could be beneficial to prevent flocking behavior. Periodic hunting acts disturb flocking behavior such that large flocks of waterfowl are not likely to congregate in a relatively small area. Such a program implemented in the primary areas of concern for Sacramento International Airport could result in beneficial effects relative to existing conditions.

Because of the overall changes in waterfowl habitat that would occur in the Natomas Basin, an analysis was conducted to determine if waterfowl could become more concentrated near the airport. This analysis projected existing and future rice acreage within the critical airport safety zones and the potential for waterfowl to become concentrated within these zones. As shown in Table 4-20, the proportion of rice fields occurring in the future within the airport safety zones, compared to the total rice fields in the Natomas Basin, is approximately the same as under existing conditions. Within the 1-mile zone, the concentration of rice acreage within the safety zones is expected to decrease by 3.48 percent compared to existing conditions. Within the 2- and 5-mile zones, the concentration of rice fields within the safety zones is expected to increase by 2.25 percent and 4.44 percent, respectively, compared to existing conditions.

TABLE 4-20
Existing and Future Rice Field Distribution

	Existing (Acres)			Future (Acres)		
	1-mile Zone	2-mile Zone	5-mile Zone	1-mile Zone	2-mile Zone	5-mile Zone
Rice Fields in Airport Zones	1,628	4,661	16,550	514	3,212	10,901
Total Rice Fields in Basin	22,979	22,979	22,979	14,258	14,258	14,258
Percent of Rice Fields in Airport Zones (Compared With Total Rice Fields in Basin)	7.08%	20.28%	72.02%	3.60%	22.53%	76.46%

For purposes of this analysis, it is assumed that the current population of waterfowl within the Natomas Basin would not change. It is also assumed that waterfowl are equally distributed throughout the basin, so that no one area tends to concentrate waterfowl disproportionately to other areas. (For further details on waterfowl habits, refer to Section 4.4.) Based on future land use changes in the Natomas Basin, the population of waterfowl within the airport safety zones is expected to remain similar to existing conditions. Within the 1-mile zone of the airport, a slight reduction in waterfowl population is expected to occur. Although waterfowl concentrations would be higher on the remaining rice lands, fewer rice lands would be available within this area and the net result is expected

to be a slight decrease in waterfowl numbers. Within the 2- and 5-mile zone, a slight increase in waterfowl population is projected. Waterfowl concentrations would be higher on the remaining rice lands, but fewer rice lands would be available within this area. Because the concentration of rice lands within the safety zones would increase (Table 4-20) the net result is expected to be a slight increase in waterfowl numbers. The expected changes in waterfowl populations within these zones could change the potential for bird strikes. These future changes in the concentration of rice acreage are, however, relatively small and are not expected to have a significant adverse impact on the potential for bird strikes to occur.

The implementation of the Sacramento International Airport Wildlife Management Plan requires direct wildlife-management techniques on airport property and also states the need to discourage land uses within the vicinity of the airport that are attractive to wildlife. Control techniques to be implemented by the Wildlife Management Plan on airport property include removal of wildlife habitat by removing sources of food, cover, and water, and direct population control. The Wildlife Management Plan also states the need for the airport to discourage surrounding land uses from attracting wildlife.

As discussed above, the Proposed Action would not directly interfere with the implementation of these measures on airport property. Although the Proposed Action does not specifically require avoiding reserve acquisition in the vicinity of the airport, implementation of the Proposed Action would not conflict with implementation of the airport's Wildlife Management Plan. In addition, representatives from the airport and the Conservancy have been engaged in discussion regarding efforts to minimize the potential for management of the habitat reserves to affect airport operations. Any potential conflict of undesirable land uses according to the Wildlife Management Plan as a result of the Proposed Action could be reduced with ongoing consultation between the Conservancy and Sacramento International Airport. Specific land use and habitat-management measures that could reduce potential flocking behavior of waterfowl within 1 mile north of the airport during winter and also meet the biological goals and objectives of the HCP would be the goal of these discussions.

4.11.1.2 Mitigation

No significant impacts were identified, therefore no mitigation is necessary.

4.11.1.3 Level of Significance After Mitigation

The impact would be less than significant without mitigation.

4.11.2 Alternative 1. Increased Mitigation Ratio

Under Alternative 1, the mitigation ratio for developed land would be increased from 0.5:1 to 1:1. The development limit for the City, Metro Air Park, and Sutter County would remain at 17,500 acres, but this amount of development would result in the need to acquire 17,500 acres of habitat reserves. As discussed previously for the Proposed Action, the mitigation requirement would not be based on the habitat value of the land developed, and the land would be acquired within the Natomas Basin from willing sellers or outside of the basin subject to the 20 percent limitation prescribed in the HCP. All other components of the Proposed Action (e.g., land acquisition and management, canal and ditch maintenance) would not change under Alternative 1. The requirement for one contiguous block of

2,500 acres would not change, and other reserve lands would be acquired to ensure that they form 400-acre contiguous blocks.

4.11.2.1 Impacts With Participation by All Permittees

Potential impacts to air quality associated with the City, Metro Air Park, and Sutter County jointly constructing habitat reserves based on a 1:1 mitigation ratio would be similar to the overall impacts for the Proposed Action. As discussed above, the conversion of agricultural lands to habitat reserves is not expected to result in waterfowl use that is substantially different than existing conditions. In addition, development-related changes in waterfowl concentration would not change under this alternative. This would remain true with 17,500 acres of habitat reserves under Alternative 1. Effects associated with the concentration of waterfowl, however, would remain the same as under the Proposed Action because land development would remain at 17,500 acres.

4.11.2.2 Mitigation

No significant impacts were identified, therefore no mitigation is necessary.

4.11.2.3 Level of Significance After Mitigation

The impact would be less than significant without mitigation.

4.11.3 Alternative 2. Habitat-based Mitigation

Implementation of Alternative 2 would require the acquisition of 17,763 acres of land for mitigation pursuant to the habitat-based mitigation ratios described in Section 2.6.2. Because the mitigation acreage under Alternative 2 would be approximately the same as under Alternative 1, potential public health-and-safety impacts as a result of implementing a habitat-based mitigation alternative would be approximately the same as described above for Alternative 1.

4.11.4 Alternative 3. Reserve Zones

Alternative 3 focuses on the acquisition of habitat reserves of specific zones within the Natomas Basin based on giant garter snake and Swainson's hawk habitat availability, including firm reserve areas north of Sacramento International Airport. The acreage to be acquired and all other HCP implementation requirements would be the same as the Proposed Action. Because of the availability of land in this area for large habitat blocks, implementation of the Proposed Action could result in similar land use patterns as the Reserve Zone Alternative. Therefore, potential health-and-safety impacts as a result of implementing the Reserve Zone Alternative could be similar to the Proposed Action. Specific future habitat-reserve acquisition under the Proposed Action, however, remains speculative.

4.11.5 Alternative 4. Reduced Potential for Incidental Take

Development of 12,000 acres under Alternative 4 would result in the acquisition of 6,000 acres of habitat reserves, based on a 0.5:1 mitigation ratio. Compared with the Proposed Action , implementing Alternative 4 would result in less land being conserved as habitat reserves (6,000 acres under Alternative 4 versus 8,750 acres under the Proposed Action). As described under the Proposed Action, waterfowl use of habitat reserves would be similar to existing conditions. Fewer habitat reserves under Alternative 4 would also not change

waterfowl use relative to existing conditions. The potential for bird-strike impacts associated with the increased concentration of waterfowl in remaining rice fields would remain similar to, but slightly less than, the Proposed Action because of the reduction development.

4.11.6 Alternative 5. No Action Alternative

Establishment of the habitat reserve system envisioned under the Proposed Action and the other alternatives would not occur under the No Action Alternative. As discussed in Section 2.6.5, planned land development and the associated mitigation for biological-resources impacts would still occur, however, and it is expected that such mitigation would require active habitat-restoration efforts resulting in similar effects as described above for the Proposed Action and the other alternatives. These activities would be similar to current land management practices in the Natomas Basin and similar habitat areas, and are not expected to result in substantially different impacts relative to current conditions.

Under the No Action Alternative, RD 1000 and Natomas Mutual would continue their activities consistent with current practices, with no substantial change relative to the Proposed Action or the other alternatives. Management of habitat reserves by the Conservancy would still be required, resulting in similar impacts as under the Proposed Action and other alternatives.

The Proposed Action and alternatives are expected to have similar effects as the No Action Alternative, and would therefore be less-than-significant relative to the No Action Alternative baseline.

4.11.7 Effects Under Independent Implementation

The adverse public health-and-safety effects described above would be proportionally reduced if the City or Sutter County did not participate in implementing the HCP. Significant impacts, however, were not identified for implementation by all permittees. Although adverse effects would be lessened with limited participation, conclusions about the significance of impacts would not change.

4.11.8 Cumulative Impacts

Cumulative impacts would include the additional effects associated with the implementation of other regional conservation activities (see Section 4.1.2). These actions could have the potential for increasing public health-and-safety risks for Sacramento International Airport. Refuge management activities and some private lands include the expansion of seasonal wetlands and other actions to implement the North American Waterfowl Management Plan and further the goals of the Central Valley Habitat Joint Venture. The North American Waterfowl Management Plan, implemented jointly by the governments of the United States, Canada, and Mexico, seeks to restore waterfowl populations through habitat protection, restoration, and enhancement activities throughout North America. The goals of the North American Waterfowl Management Plan are implemented locally by the Central Valley Habitat Joint Venture. The goals of the Joint Venture include: (1) enhancing the natural resource values on remaining wetland areas in the Central Valley (approximately 300,000 acres), (2) enhancing 443,000 acres of private agricultural lands for feeding and nesting waterfowl, (3) protecting 80,000 acres of existing

wetlands through perpetual easements or fee title purchase, and (4) restoring and protecting 120,000 acres of former wetlands.

Substantial progress has been made statewide to further the goals of the Joint Venture. Locally, this has included contributions to the establishment of the Vic Fazio/Yolo Basin Wildlife Area and acquisition of conservation easements over farmland in the northern Yolo Basin. Because the 5-mile "general zone" around the Sacramento International Airport's runways extends into the Yolo Basin, potential cumulative public health-and-safety impacts could occur as a result of habitat-conservation efforts within the Yolo Basin. Yolo Basin lands are undeveloped and currently provide habitat for migrating winter waterfowl, and therefore establishing new conservation easements is not expected to result in substantial changes in migratory-waterfowl populations within the 5-mile zone. Accordingly, cumulative impacts would be less than significant. No other habitat areas or conservation easements for waterfowl management exist within a 1- or 2- mile radius of Sacramento International Airport.

4.12 Other Impact Categories

4.12.1 Irreversible Environmental Changes

For some projects, the environmental impacts caused by implementing the project would generally be irreversible (e.g., land development). The Proposed Action would result in substantial land use changes where lands are converted to managed marsh and other natural habitats. These changes would occur through the acquisition of habitat reserve lands and are intended to be maintained as habitat reserves in perpetuity. The intent to acquire and manage the reserve lands to the benefit of the HCP's covered species would not, however, physically change the landscape so that the acquired reserve lands could not be converted to agricultural or other use.

4.12.2 Relationship Between Short-term Uses of the Environment and the Maintenance and Enhancement of Long-term Productivity

For this Proposed Action, long-term productivity is defined by the continuing ability of the Natomas Basin to provide for the needs of the various wildlife and plant species that are considered in this analysis. As described in Section 4.4, the Proposed Action is expected to provide for the continuing viability of species in the Natomas Basin, including the giant garter snake and Swainson's hawk. No irreversible changes would occur that would preclude the ability for adaptive management to help ensure that species viability is preserved. Accordingly, long-term productivity is expected to be sustained with implementation of the Proposed Action.

4.12.3 Unavoidable Environmental Effects

The conversion of agricultural lands to managed marsh and other natural habitats, a significant impact, would be an unavoidable and unmitigatable consequence of this Proposed Action. Other significant and unavoidable impacts associated with authorized development were identified in prior environmental analyses as summarized in Sections 4.2 through 4.11 and in Appendix C.

4.12.4 Growth-inducing Impacts

Projects that foster economic or population growth, or remove obstacles to population growth, are considered to have a growth-inducing effect. The Proposed Action is prepared to address the biological impacts of growth in a comprehensive, planned program, and is not in itself growth-inducing. The consequences of acquiring 8,750 acres of habitat reserves include substantial land use changes where the reserves convert existing farmlands to managed marsh and other natural habitats. As described in Sections 4.6 and 4.7, this would result in a substantial loss of productive farmland, but the social and economic consequences of these changes would be less than significant. These land use changes could result in changes to the workforce composition and adjustments in the relative role of the agricultural sector in the overall economy, but this is expected to result in a shift to other sectors that reflect the urbanizing character of the Natomas Basin. These changes are not expected to induce substantial growth.