Chapter 6
Conditions on Covered Activities

6.1 Introduction

As required by ESA, the Plan includes measures to avoid and minimize take of covered species. These measures are described as conditions on development and are designed to achieve the following:

- Avoid or minimize take of covered species resulting from covered activities on a regional scale (see discussion below).
- Avoid take by covered activities that is prohibited by law (e.g., take of fully protected species).
- Minimize adverse effects on natural communities and covered species that occur in the Preserve System near the covered activities.
- Avoid and minimize impacts jurisdictional wetlands and waters at a regional scale to meet the requirements of regional wetland permit programs that are in preparation.

The permit area excludes most high-quality habitat for covered species and high-quality jurisdictional wetlands and waters (see Chapter 5 for a discussion of conservation priorities and Chapter 2 for a discussion of requirements that the permit area for urban development not conflict with conservation priorities; see Appendix K for the regional analysis of aquatic resources). Impacts on some habitat for covered species and some jurisdictional wetlands and waters will be allowed under the Plan. Habitat preservation and enhancement will be concentrated outside the permit area, in the high-quality habitat of the proposed HCP/NCCP Preserve System. The Plan has evaluated and complied with avoidance and minimization requirements *at a regional scale* to eliminate the need for individual projects to evaluate avoidance and minimization at the project scale. Projects that implement the measures in this chapter will be in compliance with the avoidance and minimization requirements of the Plan. All activities covered under this Plan are required to conduct planning surveys to verify the assumptions used in this Plan including the regional analysis of avoidance and minimization.

These measures are required for all covered projects in the HCP/NCCP permit area (i.e., the urban development area and covered rural infrastructure projects

outside the ULL). It is the responsibility of project proponents[1] to design and implement their projects in compliance with these measures. The local jurisdiction (City or County) will evaluate all projects to ensure that they have adopted these conservation measures prior to issuance of coverage under the HCP/NCCP. For projects not subject to City or County permitting jurisdiction (e.g., projects of the cities, County, Flood Control District, or Participating Entities; see Section 8.4), the Implementing Entity will review applications (see Chapter 8). Also see Chapter 8 for a description of applicant responsibilities and the application process (Section 8.7).

The intent of these measures is, in part, to encourage individuals of covered wildlife species within the permit area to avoid or escape project construction zones. Populations of covered plants will be avoided if these species are not identified within HCP/NCCP preserves. Impacts will also be minimized by designing projects adjacent to the HCP/NCCP Preserve System in ways that reduce their impacts on covered species and habitats.

In addition to the conditions described in this chapter to avoid and minimize impacts, covered activities may also be required to pay mitigation fees (see Chapter 9, *Cost and Funding*) or provide land in lieu of mitigation fees.

6.2 Receiving Take Authorization under the Plan

6.2.1 Application Process

To receive take authorization under the state and federal HCP/NCCP permits, project proponents must apply to the appropriate Permittee for take authorization. The *appropriate Permittee* will be referred to in this section as the *HCP/NCCP application review agency*. The HCP/NCCP application review agency for different types of projects is described below.

- For private projects and other projects subject to the land use authority of a city or the County, the HCP/NCCP application review agency will be the local land use planning agency with land use authority for the project (i.e., the appropriate city or the County). Figure 6-1 provides an overview of the application and review process for such projects.
- For projects or project proponents not subject to the land use authority of a Permittee (i.e., special districts not already a Permittee[2]), the HCP/NCCP application review agency will be the Implementing Entity.
- If one of the Permittees undertakes a project in the inventory area, the HCP/NCCP application review agency will be the same Permittee. In such

[1] The term *project proponent* is used interchangeably with the term *applicant* or *project applicant* in this and future chapters.
[2] Special districts may have their activities covered by the Plan under certain circumstances. See Chapter 8, Section 8.4, *Participating Special Entity*.

cases, the Permittee must complete the same application materials required of any other project proponent and provide a copy of these materials to the Implementing Entity before granting itself take authorization for the project[3].

In all cases, the project proponent must submit an *HCP/NCCP application package*. This application package must contain the following information.

- Standard application form for coverage under the HCP/NCCP. This form will be developed prior to issuance of the state and federal HCP/NCCP permits and will be available through the local jurisdictions and on the HCP/NCCP web site.
- Survey report documenting the methods and results of required planning surveys, the methods of applicable preconstruction surveys, and the methods of applicable construction monitoring. The Implementing Entity will provide each local jurisdiction with a template survey report during the first 6 months of Plan implementation. See Section 6.3, *Surveys for Covered Activities*, for a description of these survey requirements, when they apply, and limited exemptions.
- A verified wetland delineation report is also required if jurisdictional wetlands and waters are present on site. This delineation report may be included in the survey report or may be a separate document. See Section 6.3.1, *Planning Surveys*, for details of this requirement.
- Documentation of how applicable avoidance and minimization requirements in this chapter have been incorporated into the proposed project. This documentation can be included as a separate report or as part of the HCP/NCCP survey report.

The HCP/NCCP application review agencies may adjust the required components of the application package over time in accordance with the requirements of the Plan.

6.2.2 Application Review

In reviewing applications for take authorization, the HCP/NCCP application review agency will perform the steps listed below.

1. Review the HCP/NCCP application package for completeness[4]. If the application package is not complete, it will be returned to the project proponent with an explanation of why it is incomplete.

[3] It is each Permittee's responsibility to ensure that its own projects are consistent with the terms of the Plan. Submitting the application package to the Implementing Entity for a Permittee's project is a notification process only and is intended to enable the Implementing Entity to perform its tracking responsibility.
[4] A checklist of necessary HCP/NCCP application components will be developed by the Implementing Entity within 90 days of the effective date of the HCP/NCCP and distributed to HCP/NCCP application review agencies to assist with this step.

2. If the application package is complete, verify that all required planning surveys, preconstruction surveys, or construction monitoring has been accomplished or will be accomplished. Similarly, verify that all applicable avoidance and minimization measures have been followed according to the requirements of the HCP/NCCP.
3. Calculate the fees according to the requirements described in Chapter 9, *Funding*, and consistent with the local ordinance implementing the HCP/NCCP.
4. If the project proponent requests to contribute land in lieu of fees or requests certain special project conditions, refer such requests to the Implementing Entity or other appropriate agency designated in this Plan to consider requests for special conditions[5].
5. Prepare a written determination of the application's consistency with the Plan[6].
6. Provide a copy of the application material to the Implementing Entity for entry into the HCP/NCCP database.

For project proponents that are not also Permittees (i.e., not a participating city, the County, County Flood Control District, EBRPD, or the Implementing Entity), the HCP/NCCP application review agency, before issuing take authorization, must enter into an agreement with the project proponent obligating compliance with all terms and conditions of the Implementing Agreement, the HCP/NCCP, and the state and federal permits that apply to the project. Alternatively, the local jurisdiction may impose such terms and conditions as conditions of project approval. Such terms and conditions include, but are not limited to, those listed below.

- Compliance with all relevant surveys, monitoring, avoidance, minimization, and conservation measures determined by the local jurisdiction to apply to this project as required by the Plan.
- The right for the local jurisdiction to monitor the applicant's compliance with all applicable avoidance and minimization requirements of this Plan.
- Either a fee or dedication of land in lieu of the fee as described in Chapter 9, *Funding*, and in the local Implementing Ordinance.

Review of applications for take authorization should generally occur concurrent with the environmental review of a project under CEQA. To facilitate this approach, the HCP/NCCP application review agency should generally request

[5] The Plan provides relatively few opportunities for applicants to request special project conditions. Examples include offers of land in lieu of fees, certain exceptions to stream setback requirements, and certain avoidance measures for jurisdictional wetlands and waters. Such special conditions and the entity designated to consider them are described in the Plan and summarized in Chapter 8, Section 8.7, *Roles and Responsibilities in Reviewing Applications for Take Authorization*.

[6] A template form to document the HCP/NCCP application review agency's determination of consistency with the HCP/NCCP will be developed by the Implementing Entity within 90 days of the effective date of the HCP/NCCP and distributed to HCP/NCCP application review agencies to assist with this step.

that project proponents submit the HCP/NCCP application package at the same time as the application for the first discretionary permit needed for the covered activity (e.g., application for a tentative subdivision map for a housing development). When this occurs, the HCP/NCCP application review agency should determine the completeness of the HCP/NCCP application package while determining the completeness of the application for the discretionary permit. Once the application is deemed complete, the CEQA review for the covered activity may commence and may consider the information in the HCP/NCCP application package. When the HCP/NCCP application review agency considers approving the discretionary permit for the covered activity and issues CEQA findings, it should also make a determination of consistency with the HCP/NCCP and condition the approval on performance of tasks required to comply with the HCP/NCCP (e.g., payment of applicable fees and performance of applicable surveys). For projects with pre-existing CEQA coverage or that do not require a Negative Declaration or an Environmental Impact Report, the above approach may not apply.

6.2.3 Granting Take Authorization

Take authorization will be granted to project proponents by the HCP/NCCP application review agency once the following conditions have been met.

- The HCP/NCCP permit application is deemed complete.
- The required fees have been paid (see Chapter 9, *Funding*).
- The permit terms and conditions have been set.
- The HCP/NCCP application review agency makes a determination of consistency with the HCP/NCCP.

Take authorization must be sought before, and issued no later than, the grading permit for the project is issued. If a grading permit is not required, take authorization must be granted before the first construction permit. For covered activities that do not require construction permits (e.g., certain maintenance activities), take authorization must be granted before the covered activity is performed. The project proponent will be granted take authority by the appropriate Permittee and allowed to proceed with the project consistent with the state and federal permits issued to all Permittees and consistent with other applicable local, state, and federal laws and local entitlements.

Some project proponents may wish to secure take authorization well before the grading permit or first construction permit is issued for the project because they wish to lock in fee amounts, they want the extra assurance of having take authorization in hand, or for some other reason. Take authorization may be granted well before the grading permit or the first construction permit and after local approvals for the project, as long as certain conditions are met, including early payment of fees. See Chapter 9, Section 9.3.1, *Mitigation Fees*, for these

conditions and see Chapter 10, Section 10.2.9, *Assurances to Private Landowners*, for a discussion of take authorization assurances.

6.3 Surveys for Covered Activities

Activities covered by an HCP must minimize and mitigate effects on covered species to the maximum extent practicable. To some degree, this requirement has been partially met already through careful design of the permit area and the Preserve System. Some avoidance and minimization is still required at the project level to fully meet this requirement; surveys are an important component. Three types of surveys may be required prior to or during implementation of covered activities: planning surveys, preconstruction surveys, and construction monitoring. Planning surveys are required prior to implementing covered activities to identify the natural resources affected by the proposed project and determine what additional preconstruction species surveys, if any, are needed. Planning surveys also serve another important function—to document actual impacts on land cover types to ensure that assembly of the Preserve System keeps pace with or exceeds these impacts. Preconstruction surveys, in turn, determine which species-specific avoidance and minimization measures must be applied to the project to ensure Plan compliance. Construction monitoring ensures that necessary avoidance and minimization measures are implemented properly.

Surveys are required for all covered activities except those causing temporary impacts less than 0.05 acres or temporary impacts specifically excluded from the temporary impact fee (see Chapter 9 *Funding*). The project proponent is responsible for paying for the surveys and completing the required survey report.

Small vacant lots, which are defined and mapped in Chapter 9 as being parcels less than 10 acres in size and surrounded on four sides by development (see Zone III Fee Zone described in Section 9.3.1) are required to conduct a very limited number of surveys described in this chapter:

- Western burrowing owl survey and direct take avoidance measures, if applicable;
- Swainson's hawk nest survey and direct take avoidance measures, if applicable;
- San Joaquin kit fox den survey and direct take avoidance measures, if applicable; and
- Land cover mapping.

The survey report submitted to the local jurisdiction (County or city) will contain only the results of the limited surveys above. All of these surveys can be conducted by the same qualified biologist to further reduce costs.

The intent of the survey requirements and species-specific avoidance and minimization measures is to reduce impacts to specific, high-value resources such as streams and occupied dens and nests of covered species while allowing covered activities within the permit area to take place. This Plan allows impacts on covered species within the permit area. The planning surveys are designed to minimize impacts on individual covered species during construction and to provide important data to inform project design and track Plan compliance. Preconstruction survey and construction monitoring requirements are limited to situations in which covered species could be killed or injured (as opposed to habitat removal) and avoidance is both technically feasible and biologically meaningful.

Other biological field surveys beyond those required by this HCP/NCCP (e.g., for special-status species addressed by CEQA but not covered by the Plan) may be required by local agencies.

6.3.1 Planning Surveys

Planning surveys are required prior to submission of an application for coverage under the HCP/NCCP. Requirements for planning surveys were developed in accordance the following guiding principles.

- Avoid and minimize impacts on covered species and natural land cover types to the maximum extent practicable on a regional scale.
- Provide the necessary data to track project impacts to allow the Implementing Entity to meet Plan requirements (e.g., land acquisition, stay ahead, wetland restoration).
- Simplify and reduce preproject survey requirements relative to current and future environmental regulations without the HCP/NCCP.
- Make survey requirements proportional to impacts—the survey burden should be lower on low-quality habitat than on high-quality habitat.

Project proponents will conduct planning surveys to identify the following biological resources.

- Land cover type.
- Suitable breeding habitat for Swainson's hawk, California tiger salamander, California red-legged frog, covered shrimp species, and no-take wildlife species (golden eagle, peregrine falcon, white-tailed kite, ringtail).
- Suitable breeding, roosting, or denning habitat for Townsend's big-eared bat, San Joaquin kit fox, and western burrowing owl.
- All suitable habitat for giant garter snake.
- Covered and no-take plants.

- Rare vegetation and landscape features.
- Jurisdictional wetlands and waters.

The results of the planning survey will provide project applicants with the information necessary to comply with the HCP/NCCP. Applicable avoidance and minimization measures described in this chapter must be incorporated into the project design and submitted with the application package. A survey report with the following information for the site will be included in the HCP/NCCP application package. (The Implementing Entity will provide each local jurisdiction with a template survey report during the first 6 months of Plan implementation.)

- Descriptions of the types and extent of all land cover types; uncommon vegetation types; uncommon landscape features; covered and no-take plants; jurisdictional wetlands and waters; and suitable habitat for the covered wildlife species (listed above).
- CNDDB California Native Species Field Survey Forms for all covered plants encountered on the site.
- A map of these resources.
- Quantification (i.e., acreage) of the impact of the covered activity on these resources.
- A description (and map, if appropriate) of the applicable avoidance and minimization measures required by the HCP/NCCP and incorporated into project design or project implementation (e.g., pre-construction surveys).

The applicable local land use planning agency will review and approve all planning survey reports before approving coverage under the HCP/NCCP. The Implementing Entity will enter all relevant information in the survey reports into the HCP/NCCP database and use these data to monitor Plan compliance (see Chapter 8 for a discussion of the HCP/NCCP database). Any new records of sensitive species will be submitted to the CNDDB.

Land Cover

Survey reports will include a map, quantification, and identification of the land cover types on the site according to the definitions provided in Chapter 3. The land cover types present on a site will determine, in part, whether additional preconstruction surveys or construction monitoring may be required for certain covered wildlife (Table 6-1).

Selected Covered Wildlife

Planning surveys will assess the location, quantity, and quality of suitable habitat for specified covered wildlife species on the project site. A determination of

presence/absence is not required because, to make the provisions of this Plan simple and predictable, covered species are assumed to occupy suitable habitat in impact areas, and mitigation is based on an assumption of take. Results of planning surveys will inform the design of projects adjacent to the Preserve System and be used to determine which preconstruction and construction monitoring surveys are necessary. For example, if suitable habitat is not present for one of the covered species identified above, the project proponent will not be required to conduct preconstruction surveys or construction monitoring for that species.

Covered and No-Take Plants

General habitat distribution models were developed for eight of the 11 covered plant species. The habitat requirements of the remaining three species are not well known enough to develop a credible model at this time. In addition, the locations of all covered plants within the inventory area are not known due to survey and mapping limitations. Because of these limitations, project proponents must determine if impacts on covered plants could result from covered activities so that the Implementing Entity can mitigate losses as required by the HCP/NCCP. The great majority of known populations of covered plants in the inventory area are outside the permit area; consequently, the preponderance of these populations are expected to be included incidentally as the Preserve System is established to meet vegetation community and wildlife goals and objectives. However, to ensure that covered plants are conserved, surveys will be conducted in impact areas and prior to land acquisition for the preserve system.

All project applicants must also demonstrate avoidance of all six no-take plants (see Table 6-5). In order to do so, surveys must be conducted for these six species on suitable land cover types to demonstrate their absence from project sites. If no suitable land cover types are present on site, no surveys for covered or no-take plants are required. If any no-take plants are found on the site, the provisions of Conservation Measure 1.11 must be followed (see below).

On suitable land cover types, surveys will be conducted using approved CDFG/USFWS methods during the appropriate season for identification of the covered and no-take plant species. If covered or no-take plants are found, the location, extent, and condition of all occurrences will be documented in a survey report submitted to the Implementing Entity. Survey reports will include CNDDB California Native Species Field Survey Forms for all covered or no-take plants encountered on the site. Copies of these forms will also be submitted to the CNDDB. Results of planning surveys will inform project design and be used, if avoidance is not possible, to guide the preserve-acquisition process. To allow impacts, the Implementing Entity must ensure that preserves support populations of the covered species that are as healthy as or healthier than those populations that will be adversely affected by covered activities (see Conservation Measure 1.1 Section on Incorporating Covered Plant Populations in the Preserve System). The Implementing Entity will monitor the status of all covered species in the Preserve System (see Chapter 7, *Monitoring and Adaptive Management*

Program). Project proponents wishing to remove populations of covered plants must notify the Implementing Entity of their construction schedule to allow the Implementing Entity the opportunity to salvage the populations (see Conservation Measure 3.10 at the end of this chapter).

Uncommon Vegetation and Uncommon Landscape Features

Uncommon vegetation alliances and uncommon landscape features within the inventory area may provide important habitat for many covered species and may generally support unique suites of species. Because of their distinctive character, such areas may contribute disproportionately to the overall biological diversity of the inventory area. By minimizing impacts on these alliances and features, the HCP/NCCP will contribute to the preservation of native biological diversity in the region.

For the purposes of this Plan, uncommon vegetation types are defined as those vegetation alliances or associations listed as rare or worthy of special consideration by CDFG (California Department of Fish and Game 2003 or latest version[7]). Uncommon landscape features are physical or hydrologic features that are uncommon in the inventory area and provide important habitat for covered species and biological diversity. Examples of uncommon grassland alliances that must be identified include but are not limited to those listed below.

- Purple needlegrass grassland.
- Wildrye grassland.
- Wildflower fields.
- Squirreltail grassland.
- One-sided bluegrass grassland.
- Serpentine grassland.
- Saltgrass grassland (= alkali grassland).
- Alkali sacaton bunchgrass grassland.

Uncommon landscape features that occur in the inventory area and that must be identified include but are not limited to the features listed below.

- Rock outcrops.
- Caves.
- Springs and seeps.
- Scalds.

[7] Vegetation classification by CDFG is an ongoing effort. The latest classification scheme should be used.

- Sand deposits.

It is not possible to create a complete list of the uncommon vegetation alliances or uncommon landscape features present in the inventory area. In addition, current understanding of vegetation alliances in California and the determination of which alliances are rare can change over time. These lists are meant as guides to inform the selection of rare vegetation alliances or other landscape features that should be considered in an assessment of impact sites or potential preserves. The assessment should be based on the accepted professional standards at the time (e.g., California Department of Fish and Game 2003).

Because of limitations in funding and site access, the small size of most of these features, and the inherent difficulty of observing these features from aerial photos or in the field, it was not possible to map all these features in the inventory area. Therefore, the impacts on these features that would result from covered activities cannot be evaluated with any certainty prior to implementation.

Land cover mapping on covered activity sites will include identification of any uncommon vegetation types and uncommon landscape features. Impacts to these features will be avoided and minimized when projects occur adjacent to HCP/NCCP preserves (i.e., when their avoidance will help meet HCP/NCCP biological goals). In all other circumstances, the information will verify the assumption that little or no impact on uncommon resources is taking place.

The purpose of avoidance measures under the HCP/NCCP is to minimize impacts but not to avoid all impacts on biological resources within the permit area. The HCP/NCCP permit area for urban development was designed to exclude the highest-quality habitat, including most uncommon landscape features. This approach allows the majority of conservation actions to be focused outside rather than inside the permit area for urban development. If uncommon landscape features or uncommon vegetation alliances are preserved on site, they should be connected to other open space.

Jurisdictional Wetlands and Waters

A delineation of jurisdictional wetlands and waters of the inventory area was not performed during HCP/NCCP development. It was not possible to gain access to all private property in the inventory area. Furthermore, it is not practical to conduct such a delineation for the plan because jurisdictional determinations are usually only valid for a period of five years. Jurisdictional delineations are necessary to identify regulated resources and support compliance with Sections 404 and 401 of the CWA, the Porter-Cologne Water Quality Control Act, and Section 1602 of the California Fish and Game Code. The regional wetland permitting programs developed in parallel with the HCP/NCCP, if approved, will require the delineation of jurisdictional wetlands and waters.

Chapter 3 and Appendix J quantify the extent of potentially jurisdictional wetlands and waters in the inventory area, but this estimate is an understatement

of the true extent of jurisdictional wetlands and waters in the inventory area. Consequently, site-specific surveys will be necessary to document the true extent of jurisdictional wetlands and waters affected by covered activities. Jurisdictional delineations provide a repeatable, consistent method of tracking the impacts on jurisdictional wetlands and waters within the inventory area and ensuring that these impacts are properly mitigated. This documentation also serves as a benchmark for the restoration of wetlands within preserves as compensation for such loss (see Conservation Measure 2.1).

If wetlands or other waters are present on the site, project proponents must conduct a delineation of jurisdictional wetlands and waters according to the accepted standards of USACE and CDFG and according to the wetland types and wetland delineation provisions described in Table 9-5. The delineation report will also document the expected impact on the jurisdictional wetlands and waters that would result from the project. Delineations of jurisdictional wetlands and waters must be verified by USACE, an appropriate State regulatory agency such as the RWQCBs, or the Implementing Entity prior to submittal to the County or cities. The report will be submitted to the Implementing Entity prior to receiving coverage under the HCP/NCCP to enable the Implementing Entity to track wetland impacts and ensure that wetland restoration and creation has been accomplished under the Plan to an extent sufficient to accept wetland mitigation fees. The project will not receive coverage under the Plan until it has properly mitigated the impacts on jurisdictional waters according to the terms of the HCP/NCCP (see Conservation Measures 2.2, 2.3, and 2.12 and Section 9.3.1).

6.3.2 Preconstruction Surveys for Wildlife

Few covered species will require preconstruction surveys because the Plan assumes some take of covered species. Preconstruction surveys are limited to those species that will benefit the most by minimizing take of individuals. In some cases, preconstruction surveys are required to address the uncertainty of certain habitat models (e.g., giant garter snake). Preconstruction surveys will be conducted for the following covered wildlife species.

- Townsend's big-eared bat.
- San Joaquin kit fox.
- Golden eagle.
- Western burrowing owl.
- Swainson's hawk.
- Giant garter snake.
- Covered shrimp species.

If projects contain the following types of habitat, then preconstruction surveys will be necessary to establish presence of covered species and to implement

additional avoidance and minimization measures (see Table 6-1 for a summary of all species survey requirements).

- Suitable breeding habitat for Swainson's hawk, covered shrimp species, and golden eagle.
- Suitable breeding, roosting, or denning habitat for Townsend's big-eared bat, San Joaquin kit fox, and western burrowing owl.
- All suitable habitat for giant garter snake.

The need for preconstruction surveys will be based on results of planning surveys conducted for covered wildlife. Should planning surveys identify the species land cover type and specific habitat elements described in Table 6-1 for the covered wildlife species, and should project proponents not avoid impacts by modifying project design or project implementation, preconstruction surveys will be used to identify the site-specific measures required to avoid and minimize take of the select covered species.

Preconstruction surveys within the Preserve System will take place at construction sites prior to implementing habitat enhancement, restoration, or creation measures and preserve-related maintenance activities that could result in take of select covered species. In some cases, preconstruction surveys will trigger construction monitoring (see Table 6-1).

6.3.3 Construction Monitoring

Construction monitoring entails the monitoring by biologists of key biological resources identified during the planning and preconstruction surveys. Construction monitoring requires the presence of biological monitors during implementation of covered activities where resources that are protected under the HCP/NCCP have been identified in or near construction sites. Construction monitoring ensures that the impact avoidance and minimization measures integrated into the project design and submitted with the application package are properly implemented.

If necessary, project proponents will undertake construction monitoring during project implementation to ensure that measures required to avoid and minimize impacts on covered species and natural communities are properly implemented. Resources identified in planning or preconstruction surveys will be the focus of construction-monitoring efforts. Construction monitoring will be conducted by qualified biologists. Before implementing a covered activity, the project proponent will develop and submit a construction-monitoring plan to the Implementing Entity for approval. Elements of a brief construction-monitoring plan will include the following components.

- Results of planning and preconstruction surveys.

- Description of avoidance and minimization measures to be implemented, including a description of project-specific refinements to the measures or additional measures not included in the HCP/NCCP.
- Description of monitoring activities, including monitoring frequency and duration, and specific activities to be monitored.
- Description of the onsite authority of the construction monitor to modify implementation of the activity.

Construction monitoring is necessary to ensure that avoidance and minimization measures are implemented in accordance with permit requirements. Construction monitoring is the responsibility of the project proponent.

6.4 Specific Conditions on Covered Activities

Conditions on covered activities are an important part of the conservation strategy. Each conservation measure below is numbered using the same system as in Chapter 5. Conservation measure reference numbers sequentially follow the last measure at each level (landscape, community, species) in Chapter 5.

6.4.1 Landscape-Level Measures

Conservation Measure 1.6. Minimize Development Footprint Adjacent to Open Space

Measure

When a project site is adjacent to HCP/NCCP preserves, likely HCP/NCCP acquisition sites (i.e., within the high or moderate priorities for conservation, see Figure 5-3), or existing public open space that is or will be linked to HCP/NCCP preserve, project applicants are encouraged to minimize their development footprint and set aside portions of their land to contribute to the HCP/NCCP Preserve System. Land set aside that contributes to the HCP/NCCP biological goals and objectives may be credited against development fees (see Chapters 8 and 9).

This option should be considered to meet the overall objective of providing an adequate buffer between new development and existing or new open space (see Conservation Measures 1.7 and 1.8).

Rationale

Some impacts on vegetation communities and covered species are inevitable within the inventory area due to the growth within the UDA. The scale and magnitude of that impact will depend, in part, on the patterns of development that the cities and the County allow. A major goal of this HCP/NCCP is to provide take authorization for development in areas of low biological value in exchange

for the preservation, enhancement, and restoration of areas with high biological value.

Project proponents are required to minimize their impacts on natural vegetation communities and covered species in order to meet the regulatory requirements of ESA. Although the Plan does this on a large scale, there are still opportunities to avoid and minimize impacts on a local scale when projects occur adjacent to existing or future open space. Good project design at these urban-wildland interfaces is critical to the success of the open space and to the HCP/NCCP preserves as part of that open space. This conservation measure is intended to help achieve compliance with the avoidance and minimization requirements of ESA and CWA. This measure is not intended to result in avoidance of small, isolated habitats on a project-by-project basis.

Conservation Measure 1.7. Establish Stream Setbacks

Measure

A stream setback will be applied to all development projects covered by the HCP/NCCP according to the stream types listed in Table 6-2. The setback is measured from the top of the stream bank in an aerial perspective (to eliminate differences in setbacks on different slopes). Where native woody riparian vegetation is present, setbacks will extend, at minimum, to the outer dripline of this vegetation. Stream setbacks will be established for all perennial, intermittent, and ephemeral streams for all covered activities within the UDA. Stream setback requirements have been developed on the basis of an extensive literature review of applicable research from both local and national sources (Table 6-3) and in consultation with USFWS, CDFG, USACE, SWRCB, RWQCBs, and EPA. For the purpose of determining required stream setbacks, streams will be assigned to one of five categories.

- Concrete channel.
- First and second order ephemeral reaches in urban and agricultural areas.
- First and second order ephemeral reaches in natural areas.
- Perennial, intermittent, or third or higher order ephemeral reaches in urban areas except Marsh Creek mainstem.
- Perennial, intermittent, or third or higher order ephemeral reaches in agricultural or natural areas and Marsh Creek mainstem.

No setbacks are required on irrigation ditches, underground stream reaches, or on drainages and swales that have neither defined bed and bank nor evidence of scour or sediment transport. It is anticipated that these features are likely to be filled in the course of covered development activities. However, where impacts to such features are sufficiently extensive to result in changes to the hydrograph of the watershed, measures will be implemented to maintain the baseline hydrograph, in keeping with requirements of the RWQCB (C3 provisions) and Conservation Measure 1.10 (Maintain Hydrologic Conditions and Minimize

Erosion). Irrigation ditches, underground stream reaches, and swales may provide important hydrologic/ecologic support functions for other downstream systems and features. Such support functions include being "catchment areas" or hydrologic source areas for surface flows or shallow subsurface flows that support downstream wetlands.

The stream categories above are designed to correlate with existing habitat quality for species covered by the HCP/NCCP and with potential impacts of development to stream functions. Stream setbacks are designed to protect existing habitat quality, to protect water quality and hydrologic processes through buffering, and allow for at least minimal restoration. For informational purposes, the Implementing Entity will create and make available to local jurisdictions digital and hardcopy maps categorizing stream reaches according to this system.

Local jurisdictions will ensure that project proponents seeking coverage under the HCP/NCCP adhere to setback requirements. Rare exceptions to the requirements may be granted by local jurisdictions according to the limitations on exceptions to setback requirements described in Table 6-2 if the local agency finds that complete adherence to the setback requirement is not practicable. Additional, site-specific exceptions will be considered case by case on the basis of factors such as unusual topography or reasonable economic use of a highly constrained site and shall require the approval of the Implementing Entity for projects within the UDA or the approval of CDFG and USFWS for projects outside the UDA (see Chapter 8, Section 8.7 for more information). Activities granted any such exception must mitigate these additional impacts as described below. Technical assistance will be provided by the Implementing Entity, if needed.

Project proponents are encouraged to site trails and access roads outside the required setback to reduce disturbance to wildlife that use adjacent streams and riparian habitats. When roads and trails cannot be sited outside the required setback, they must be sited as far from the stream channel as practicable, must adhere to limitations on exceptions to stream setback requirements described in Table 6-2, and must mitigate additional impacts as described below. Project proponents are encouraged to use permeable or semi-permeable surfaces on roads and trails within stream setbacks as long as they are consistent with safety and zoning limits. If such surfaces are used, the project may be eligible for fee reductions (see below).

Water quality treatment wetlands and grassy swales may be included within the setback if consistent with the biological goals and objectives of the Plan and the biological goals of the setback.

The HCP/NCCP development fee will not apply to the portions of the development project within the stream setback if the land in the stream setback is precluded from future development (including active recreational facilities such as turf) by restrictions placed in the deed (see Section 9.3.1). If the stream setback deed restriction exceeds the minimum required, the fee may be waived on the entire protected area provided that the Implementing Entity finds that the

entire protected area provides a stream buffer benefit. Roads or trails constructed in the outer third of the setback with permeable or semi-permeable surfaces may be accommodated within the deed restriction; projects with such features retain eligibility for the fee waiver.

If deed restrictions are not provided on the stream setback or if the development is granted an exception to the stream setback, the project proponent shall be charged the applicable HCP/NCCP development fee over the entire area (i.e., development area and the diminished setback). Development granted an exception to the stream setback shall also be required to mitigate for the loss of stream buffer by restoring riparian vegetation on site or off-site at a 0.5 to 1 ratio or to pay one half the riparian impact fee per acre of setback encroachment[8]. Development that causes fill of streams or other jurisdictional wetlands and waters shall also be subject to the wetland fee described in Section 9.3.1. All fee requirements described in this paragraph may also be satisfied with the applicable land-in-lieu of fee provisions described in Section 8.6.7 or with the applicable provisions in Section 9.3.1 for applicants to perform direct mitigation for impacts on jurisdictional wetlands and waters in lieu of paying a fee.

The required stream setbacks proposed by this measure are designed to maintain existing habitat value for covered species, which is generally low within the UDA. Existing habitat value is largely correlated with adjacent land use. While these setbacks are designed to maintain a limited restoration potential, this measure is not intended to be an urban creeks restoration program, which is outside the scope of the HCP/NCCP.

The stream setback measure is intended to achieve the following purposes.

- Maintain or improve water quality by filtering sediments and pollutants from urban runoff before they reach the stream.
- Allow for protection of preserved and restored riparian woodland and scrub within and adjacent to the stream channel.
- Maintain a buffer zone between urban development and existing and restored nesting habitat for Swainson's hawk and other bird species.
- Maintain and enhance the water quality of the stream to protect native fish populations, including populations of special-status species that occur in downstream reaches (e.g., fall-run Chinook salmon in Marsh Creek).
- Maintain a more viable wildlife corridor for some species (e.g., California red-legged frog, foothill yellow-legged frog) than would be present with a narrower buffer zone.
- Maximize the natural flood protection value of the floodplain.

[8] Roads, trails, bridges, turf, and development of all kinds within the setback will be considered encroachments; roads and trails constructed with permeable and semi-permeable surfaces may have their mitigated acreage reduced by 50%.

- Provide for recreational trails along the corridor that are compatible with wildlife use.

Setback requirements that are larger or more restrictive than those described in this conservation measure and in Table 6-2 could accomplish additional goals or may be necessary to comply with other regulations, but are not required by this Plan. For example, a wider corridor could provide aesthetic benefits and could increase habitat values, water quality protection, and opportunities for recreation. A minimum stream setback of 100 feet has been recommended in Brentwood to achieve habitat protection and enhancement goals (Natural Heritage Institute 2002). This setback is based on an extensive review of existing conditions in Brentwood and published literature on stream setbacks (e.g., Young et al. 1980; Lynch et al. 1985; Magette et al. 1987; Herson-Jones et al. 1995; Spackman and Hughes 1995; Hagar 1999). Tables 6-3 and 6-4 summarize available data on buffers for a variety of purposes (including some that go beyond the purposes of this conservation measure), and provide examples of existing and proposed buffer requirements elsewhere in the greater San Francisco Bay Area.

Contra Costa County has policies encouraging stream setbacks from new development. The Conservation Element of the General Plan (Contra Costa County 1996b) states:

> Setback areas shall be provided along natural creeks and streams in areas planned for urbanization. The setback areas shall be of a width adequate to allow maintenance and to prevent damage to adjacent structures, the natural channel and associated riparian vegetation. The setback area shall be a minimum of 100 feet; 50 feet on each side of the centerline of the creek (Policy 8-89).

The County also requires minimum setbacks to meet water quality and erosion-control goals through a stream ordinance for unimproved earthen channels. This ordinance requires a "structure setback line" that varies between 30 feet and 50 feet from top of bank depending on the height of top of bank above the channel invert (County Code Title 9, Division 914-14.012). Some participating cities have or will have their own similar setback ordinances. All covered activities must also meet County and city setback requirements, where applicable.

Conservation Measure 1.8. Establish Fuel Management Buffer to Protect Preserves and Property

Measure

When a project site is adjacent to HCP/NCCP preserves, likely HCP/NCCP acquisition sites (i.e., within the high or moderate priorities for conservation, See Figure 5-3), or existing public open space that is or will be linked to HCP/NCCP preserve, a fuel management buffer will be established between the project site and the boundary of the existing or future conservation area. The purpose of buffer zones is to provide a buffer between development and wildlands that

allows adequate fuel management to minimize the risk of wildfire damage to property or to the preserve.

The minimum buffer zone for new development is 100 feet. This requirement is designed to provide minimum fire protection for the terrain in the inventory area (Wormer, pers. comm.; Gipson, pers. comm.; Epperson, pers. comm.). In cases where development is proposed adjacent to an existing or likely future HCP/NCCP preserve (defined by an Acquisition Analysis Zone with a high priority for conservation), local jurisdictions will review development proposals to ensure this minimum buffer is incorporated. Existing public roads between the development and the preserve can be counted towards a portion of the 100-foot buffer zone. Since site-specific circumstances may in rare instances warrant exceptions to the fuel management buffer requirement, exceptions to this requirements may be granted but must be approved by the Implementing Entity.

This buffer zone is designed to accommodate a minimum defensible space between urban development and open space. This space will be maintained as a fuel break within the development. Various land uses can occur within the buffer zone as long as they reduce fire hazards (e.g., trails, irrigated turf, livestock grazing); allowable uses must comply with the urban-wildland interface guidelines described in Conservation Measure 1.9 and Appendix E. If there are no new land uses within the buffer zone, it must be managed to reduce fire risk through regular mowing, disking, or other effective management technique. The cost of this management will be borne by the landowner.

Buffer zones within new development will not count toward land acquisition requirements or land dedication in lieu of development fees. If, by mutual agreement of the Implementing Entity and the landowner, the landowner transfers the buffer zone to the Implementing Entity or other entity designated by the Implementing Entity to manage lands in the Preserve System, the Implementing Entity can assume management responsibility over this zone and the land may be receive some credit toward Plan requirements consistent with the provisions on Buffer Zones described in Chapter 5 (e.g., the buffer exceeds the minimum or contains habitat land that is not disked). Otherwise, the landowner will be responsible for buffer zone management in accordance with this HCP/NCCP.

As discussed in Chapter 4 and Appendix E, urban development will have indirect effects on habitat and species in the Preserve System beyond 100 feet (e.g., predation and harassment by pets, noise, light, runoff if development is upslope of preserve). Because these indirect effects are accounted for in the impact analysis and take authorization requested by the Permittees, additional buffers are not required.

Conservation Measure 1.9. Incorporate Urban-Wildland Interface Design Elements

Measure

New land uses adjacent to preserves have the potential to adversely affect covered species and natural communities within the preserves. Damaging effects may include vandalism, dumping of trash, trampling, mountain bike use, and off-road vehicle use; runoff from adjacent streets and landscaped areas containing lawn fertilizer, pesticides, and vehicle waste (petroleum byproducts); introduction of invasive nonnative species (e.g., pampas grass, French broom, Argentine ants, giant reed); lights and noise from nearby development; unregulated movement of domestic animals; and a lack of barriers to covered species entering developed areas.

Urban development that occurs adjacent to preserves or planned future preserves will incorporate design elements at the urban-wildland interface to minimize the indirect impacts of development on the adjacent preserve. This measure will generally apply to projects that occur at the edge of the UDA and adjacent to areas with moderate or high priorities for land acquisition (see Conservation Measure 1.8). The relevant jurisdiction (city or County) will determine which development projects are subject to this measure. The Implementing Entity will provide technical assistance when needed. Design elements to be considered and incorporated at the urban-wildland interface, if appropriate, include but are not limited to those listed below.

- Roads with appropriately designed permanent wildlife barriers may be placed at the edge of development, rather than abutting front-loaded lots against the preserve boundary (to reduce the incidence of domestic pets entering the preserves).
- Backyard fences may be designed to prevent pets from entering preserves with sensitive habitat or covered species and to preclude illegal gates and dumping.
- Public roads adjacent to preserves may be fenced to prevent unauthorized public access.
- Development footprints may be designed with straight edges at the boundary with preserves or buffers to minimize the length of the urban-wildland interface.
- Drainage systems may be installed to protect preserves from urban runoff.
- Low-glare or no lighting may be installed at the edge of development.
- Non-invasive landscaping may be used to avoid the escape of undesired plants into adjacent preserves.
- Fire-resistant landscaping that could also serve as a fire break may be used.
- Access restrictions or informational kiosks may be installed to educate residents about the adjacent preserve.

Additional design elements to be considered are described in detail in Appendix E, *Urban-Wildland Interface Design Guidelines*.

Any design features incorporated into projects at the urban-wildland interface will be located within the development (i.e., not on the HCP/NCCP preserve). These features will be maintained by the property owners through a homeowners association, landscape and lighting district, or similar mechanism. As with other project elements, it is the responsibility of the local jurisdictions to monitor compliance.

Rationale

New preserves, particularly in Zones 1 and 2, will border existing and proposed urban development that includes (or will include) areas highly unsuitable for covered species; such areas include single-family homes with back or side yards, cul-de-sacs, residential streets, or parking lots. This situation presents a management challenge to preserving the covered species and habitats in the adjacent preserves.

Design features incorporated into development projects can be effective means to reduce indirect impacts on biological resources in California (Kelly and Rotenberry 1993). By incorporating design features into development to minimize indirect effects, the buffer zone needed adjacent to preserves can be narrower (see Conservation Measures 1.7 and 1.8 for buffer requirements).

Conservation Measure 1.10. Maintain Hydrologic Conditions and Minimize Erosion

Avoid or minimize direct and indirect impacts of new development on local hydrological conditions and erosion by incorporating the applicable Provision C.3 Amendments of the Contra Costa County Clean Water Program's (CCCCWP's) amended NPDES Permit (order no. R2-2003-0022; permit no. CAS002912) or the NPDES permit which is current at the time of project approval. This measure applies to all new development within the permit area covered by the HCP/NCCP and subject to this NPDES permit or its successors. The overall goal of this measure is to ensure that new development covered under the HCP/NCCP has no or minimal adverse effects on downstream fisheries to avoid take of fish listed under ESA or CESA.

The C.3 Provision contains performance standards to reduce construction and postconstruction impacts of applicable new development projects on local water quality. The C.3 standards are more stringent than current water quality standards. The following is a brief summary of the key requirements of the C.3 Provisions relevant to the HCP/NCCP.

- Develop stormwater treatment controls such as detention basins sized, at a minimum, to treat runoff in accordance with the criteria provided in the Provisions.

- Implement a verification program for treatment controls to ensure that all installed controls are being appropriately operated and maintained.
- Control peak runoff flows and volumes by means of creation and implementation of a Hydrograph Modification Management Plan subject to Provision requirements.
- Provide compensatory mitigation to the appropriate jurisdiction (i.e., city or County) for projects where meeting Provision requirements are physically impractical.
- Limit the use of stormwater controls that function primarily as infiltration devices in order to protect groundwater quality and local stream hydrograph.

For a more in-depth discussion of all of the Provisions please see amended NPDES Permit No. CAS0029912. Hydrologic conditions will also be maintained and improved by establishing minimum stream and riparian buffers on all perennial, intermittent, and ephemeral streams (see Conservation Measure 1.7).

Rationale

Stream and riparian systems play a vital role in the movement of nutrients and materials through a watershed and provide essential habitat for a broad array of amphibians, reptiles, birds, and mammals. Because these systems represent the primary conveyance pathways for most material in a watershed, they are particularly effective at transporting and accumulating a number of common urban pollutants such as oil, grease, heavy metals, refuse, pesticides, nutrients, and pathogens. Moreover, modifications of watershed hydrology resulting from increased impervious surfaces (i.e., roofs and roads) also play a major role in degradation of these valuable habitats. These modifications can result in increased peak flows, decreased base flows, and unnaturally elevated erosion and fine sediment deposition rates in local streams. These changes, in turn, further affect habitat for native biota. Projects that implement the C.3 Provisions will minimize their effects on water quality and stream habitat by maintaining or improving preproject hydrological conditions.

This measure is specifically intended to minimize negative effects of development on sensitive fish populations in the inventory area and downstream in the Delta. Research in California and elsewhere has shown that urban runoff can introduce appreciable toxicity to aquatic organisms (Marsh 1993; Schiff and Stevenson 1996; Skinner et al. 1999). The C.3 Provisions address this potential for contamination by ensuring that urban stormwater runoff generated by new developments is treated appropriately before it is discharged into local waterways. In addition to reducing/controlling contaminant inputs from urban runoff, the C.3 Provisions also specifically address maintenance and/or restoration of stream hydrographs. Reduction of peak flows will also support conservation of fish by reducing bank erosion and resultant channel simplification, turbidity, and deposition of fine sediments.

Conservation Measure 1.11. Avoid Direct Impacts on Extremely Rare Plants, Fully Protected Wildlife Species, or Covered Migratory Birds

Covered activities will avoid all impacts on extremely rare plant species listed in Table 6-5 as *no-take* species. These no-take plant species are all presumed extinct or extirpated from the inventory area[9], and the likelihood of discovery of new populations is low. If a new population of any of these species is found, its protection would be of the highest importance for conservation of the species.

Planning surveys will identify no-take plant species (see Section 6.3.1, *Planning Surveys*). Project proponents must demonstrate one of the following conditions:

- no-take plant species are absent from the project site, and the project will not result in indirect impacts if such plants are found adjacent to the project site; or
- if no-take plant species are found at a project site, all direct and indirect impacts on such plants that could result from the project are avoided.

If a no-take plant population is found on a site, it is the responsibility of the property owner to adequately preserve the population in the development plan for the site (e.g., link to existing public lands, provide adequate buffers), prepare a long-term management and monitoring plan, and fund the implementation of this plan. Land that meets HCP/NCCP goals and objectives may be transferred to the HCP/NCCP Implementing Entity to implement long-term management (and to meet some HCP/NCCP goals and objectives) as long as the applicant fully funds the preparation of the required management plan to address the management needs of the no-take plant population. The HCP/NCCP does not budget for the intensive management that may be required to maintain an unexpected no-take plant population. If the applicant transfers ownership and management responsibility of the site to the Implementing Entity, the applicant may be required to provide additional funds (beyond the HCP/NCCP fee) to offset the additional management costs.

In the event that complying with this conservation measure would severely impact a property owner's use or economic interest in private property, the Implementing Entity, CDFG, and FWS shall promptly consult with the property owner to consider whether any modifications to this conservation measure are appropriate that will reduce the impact on the property owner, or whether the Implementing Entity may instead purchase the property as part of the Preserve System. Even if the property owner sells or otherwise transfers ownership of the land to the Preserve System, the property owner is responsible to fund the preparation and long-term implementation of the management and monitoring plan for conservation of the plant population.

[9] One exception is large-flowered fiddleneck; a population of this species has been experimentally established within the inventory area on EBRPD land.

Several wildlife species that occur in the inventory area are listed as fully protected (as defined under Sections 3511 and 4700 of the California Fish and Game Code): white-tailed kite, peregrine falcon, golden eagle, and ringtail (Table 6-5). As described in Chapter 1, CDFG cannot issue permits for take[10] of these species. To comply with these regulations, covered activities will avoid any take of fully protected wildlife species as defined under the California Fish and Game Code. All three fully protected raptor species forage widely throughout the inventory area but nest in discrete locations. To comply with this measure, project proponents covered under the HCP/NCCP must not disturb or destroy nests of these fully protected species or of other birds (per Section 3503 of the California Fish and Game Code). Ringtail is likely common in woodlands in the inventory area. Direct impacts on this species must also be avoided.

Planning surveys will establish whether suitable habitat is present for any of these species and projects will be designed to avoid take should any such species be found on the property (see Chapter 6 for planning survey requirements and procedures).

All birds covered by the Plan (tricolored blackbird, western burrowing owl, golden eagle, and Swainson's hawk) are also considered migratory birds and subject to the prohibitions of the Migratory Bird Treaty Act (MBTA). Actions conducted under the Plan must comply with the provisions of the MBTA and avoid killing or possessing covered migratory birds, their young, nests, feathers, or eggs. Because none of the covered bird species are currently listed under the ESA, none of the covered birds are eligible for a Special Purpose Permit associated with the HCP/NCCP (as described in Appendix 5 of the Habitat Conservation Planning Handbook). Should any of the covered birds become listed under the ESA during the permit term, the ESA permit would also constitute an MBTA Special Purpose Permit for that species as specified under 50 CFR Sec. 21.27 subject to renewal by the Permittees.

To fulfill the requirements of the Migratory Bird Treaty Act, covered activities must not result in take as defined by the MBTA of covered bird species. Conservation Measures 1.12 and 1.14 incorporate avoidance guidelines for compliance with the Migratory Bird Treaty Act. In addition, avoidance and minimizations measures for burrowing owl, golden eagle, and Swainson's hawk are described in detail in Section 6.3.3. Covered activities with the potential to take tricolored blackbird nests will be avoided during the nesting season (April 1 to July 1).

Rationale

Several extremely rare plant species are known to have occurred (or are very likely to have occurred) historically in the inventory area. Several of these plant species are presumed extinct. The discovery of a population of any of these extremely rare plant species (especially those presumed extinct) within the inventory area would be a significant find, and preservation of that population

[10] Take of Fully Protected species is defined more narrowly in the California Fish and Game Code than in the ESA; see Chapter 1, *Introduction*, for details.

would be of the highest priority for species conservation. Any direct or indirect adverse effects on extremely rare species may jeopardize their continued existence. Although some of these extremely rare plants are not state- or federally listed, they may become so during the permit term.

The California Fish and Game Code prohibits the take of fully protected species (Sections 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], and 5515 [fish]). Take is defined by the Fish and Game Code as the action of or attempt to "hunt, pursue, catch, capture, or kill." (Section 86). CDFG includes in this definition of take any impacts on the species' habitat that are sufficient to result in the death of individuals of that species. Any take of fully protected species would violate these Code provisions. Section 3503 of the California Fish and Game Code prohibits the take of eggs and nests of birds, including birds of prey (Section 3503.5); these prohibitions must also apply to projects covered under the Plan.

The HCP/NCCP assumes that no-take plant populations will not be found within the permit area; consequently, funds for their long-term management and monitoring are not provided in the Plan.

Conservation Measure 1.12. Implement Best Management Practices for Rural Road Maintenance

Road maintenance activities have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways, spreading invasive weeds, and disturbing breeding wildlife. In order to avoid and minimize these impacts, the BMPs listed below will be used where appropriate and feasible for all covered road maintenance activities.

- Silt fencing or other sediment control device will be installed downslope from maintenance activities that disturb soil to minimize the transport of sediment off site.
- In the course of rural-road maintenance, no erodible materials will be deposited into watercourses. Brush, loose soils, or other debris material will not be stockpiled within stream channels or on adjacent banks. This BMP does not refer to the use of packed earth or the planting of vegetation to repair and stabilize earthen channels, as discussed in Conservation Measure 1.13 below.
- Herbicides and pesticides should be used only when necessary and will be applied in strict compliance with label requirements and state and federal regulations. Herbicides and pesticides will only be applied when weather conditions will minimize drift and impacts on non-target sites.
- Maintenance activities on rural roads adjacent to natural land cover types will be seasonally timed, when safety permits, to avoid or minimize adverse effects on active nests of resident and migratory birds, including the covered birds (Swainson's hawk, golden eagle, tricolored blackbird, and western

burrowing owl). This measure is particularly relevant for right-of-way mowing, brush clearing, and tree trimming. Project proponents should coordinate with the wildlife agencies to develop schedules that optimize logistical and financial needs while avoiding potential impacts to nesting birds.

- Mowing equipment will be thoroughly cleaned before use in rural areas so they are free of noxious weeds (e.g., yellow star-thistle) and do not introduce such weeds to new areas.
- Maintenance or repair of road medians or shoulder barriers in areas that support natural land cover types (e.g., annual grassland, oak savanna, oak woodland) will not reduce the ability of wildlife of all types to move through or over them, within safety limits. If possible, replacement or repair of road medians should improve the ability of wildlife to move past these structures.

Rationale

Most road maintenance activities are expected to have little or no effects on covered species because they occur within the disturbed footprint of the road, median, or shoulder. Some activities, however, have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways or by spreading invasive weeds, as well as by direct disturbance of breeding wildlife species that may occur adjacent to rural roads. In order to meet regulatory requirements under the Plan to avoid and minimize impacts to the maximum extent practicable on a regional scale, this conservation measure was developed in accordance with the activity guidelines used by the Contra Costa County Department of Public Works and with the input of the HCPA, CDFG, and USFWS.

Conservation Measure 1.13. Best Management Practices for Flood Control Facility Maintenance

Flood control maintenance activities have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways and disturbing breeding wildlife. In order to avoid and minimize these impacts, the BMPs listed below will be used where appropriate and feasible for all covered activities.

- Silt fencing or other sediment-control device will be installed downstream from maintenance activities to minimize the transport of sediment off site.
- Repaired surfaces of earthen flood-control channels will be covered with soil and revegetated, except in cases where soil would be expected to erode rapidly, such as during the rainy season or in channels with hardened banks. Seed mixes for temporary erosion control will be free of invasive species. Seed mixes where vegetative cover will be reestablished will be free of invasive species and composed of a majority of native species by weight or using other forms of native vegetation, such as willows.
- Repairs to flood-control channels will incorporate bioengineering techniques.

- After cleaning culverts, subdrains, and other flood-control infrastructure, silt will be disposed of in an approved upland stockpile site where the material cannot reenter a waterway.
- If water and sludge must be pumped from a subdrain or other structure, the material will be conveyed to a settling basin to prevent sediment from entering the waterway.
- Power tools and heavy equipment used for flood-control maintenance (e.g., silt or vegetation removal) will be serviced and fueled away from waterways in a designated area. Spills will be absorbed and waste disposed of in a manner that will prevent pollutants from entering a waterway.
- Timing of maintenance activities in rural areas will consider seasonal requirements for aquatic species (including covered species).

Rationale

In order to meet regulatory requirements under the Plan to avoid and minimize impacts to the maximum extent practicable on a regional scale, this conservation measure was developed in accordance with the activity guidelines used by the Contra Costa County Department of Public Works and with the input of the HCPA, CDFG, and USFWS.

Conservation Measure 1.14. Design Requirements for Covered Roads outside the UDA

Measure

New roads or road improvements covered by the HCP/NCCP outside the UDA (see Chapter 2) will have impacts on many covered species far beyond the direct impacts of their project footprints. For example, new or expanded roads may create major hazards or barriers to the movement of mobile species such as San Joaquin kit fox, California red-legged frog, California tiger salamander, and Western pond turtle. Roads and other linear projects also create dispersal corridors for nonnative plants, introduce runoff of car waste (e.g., oil, grease, radiator fluid), and create substantial noise and physical disturbance. Vehicle traffic on roads generate debris such as tires, litter, or car parts that can be hazardous to wildlife.

Rural road projects in cultivated agricultural areas of the eastern portion of the inventory area are not expected to have the substantial indirect effects of road projects in grassland, oak woodland, and other natural land cover types because wildlife values in cultivated agricultural areas are relatively low. Furthermore, the covered species found in cultivated agriculture (e.g., Swainson's hawk, western burrowing owl, tricolored blackbird) would be primarily affected only by the actual footprint of roads.

To minimize the impacts of new, expanded, and improved roads in agricultural and natural areas of the inventory area, road and bridge construction projects covered by the Plan outside the UDA will adopt the siting, design, and construction requirements discussed below and listed in Table 6-6. The

requirements and guidelines in Table 6-6 were developed in close coordination with CDFG, USFWS, and the Contra Costa County Public Works Department. According to the table, the design elements listed in this measure fall into one of four categories in Table 6-6 depending on the project.

- **Required** (R). Avoidance/minimization measure is required and cannot be waived.
- **Possible** (P). Avoidance/minimization measure is required unless field data collected at the site or in comparable areas elsewhere demonstrate that the measure would not benefit the target wildlife species. CDFG and USFWS must also agree to waive the requirement.
- **Optional** (O). Avoidance/minimization measure can be implemented at the Permittee's discretion. If implemented, a discount will be applied to the road fee. This discount will be determined on a case-by-case basis by the Implementing Entity.
- **Not Applicable or Not Required** (N/A). The impacts of the transportation project do not warrant the avoidance/minimization measure, or the measure would not be feasible.

Proponents of rural road projects seeking coverage under the HCP/NCCP that result in new ground disturbance or that create or worsen a wildlife movement barrier must submit an application to the Implementing Entity, CDFG and USFWS that explains how project siting, design, and construction would comply with the terms of this conservation measure according to the requirements and options in Table 6-6. (One project, Vasco–Byron Highway Connector, has varying requirements in Table 6-6 depending on where the project is ultimately located. Road maintenance projects are subject to Conservation Measure 1.12 but not the provisions of Conservation Measure 1.14.)

In order to receive take coverage under the Plan, CDFG and USFWS must approve the application as consistent with this and any other applicable conservation measures in the HCP/NCCP. This additional compliance step is necessary because of the complexity of rural road projects and their expected substantial effects on covered species.

Design Requirements for Road Safety Improvement Projects.
The following road safety improvement projects are not subject to the design requirements listed below or in Table 6-6 because they are not expected to result in new ground disturbance and are not expected to create or worsen a wildlife movement barrier.

- Installing traffic signals, signs, flashing beacons, or other safety warnings.
- Painting new lane striping.
- Installing "rumble" strips or other safety markers.
- Other road safety improvements that do not result in a significant change in road width or alignment.

The following road safety improvement projects are subject to the design requirements below and in Table 6-6 because they are expected to result in new ground disturbance or may create or worsen a wildlife movement barrier.

- Increasing road lane widths or adding turn lanes (but not increasing the number of lanes).
- Minor curve realignment for safety purposes (less than 250 feet long and less than 0.25 acre of new ground disturbance).
- Installing median barriers or other impermeable safety barriers.
- Constructing, resurfacing, or regrading road shoulders.

Siting Requirements

- Planned roads will be located in the least environmentally sensitive location feasible and will avoid, to the greatest extent feasible, impacts on covered species and sensitive natural communities such as wetlands. Alignments will follow existing roads, easements, rights-of-way, and disturbed areas as appropriate to minimize additional habitat fragmentation. The footprint of disturbance will be minimized to the maximum extent practicable.
- Equipment storage, fueling, and staging areas will be sited on disturbed areas or on ruderal or non-sensitive nonnative grassland land cover types, when these sites are available, to minimize risk of direct discharge into riparian areas or other sensitive land cover types.
- Project surveys, including land cover mapping, will be conducted during the conceptual planning stage of each project (i.e., well in advance of project design) so that the results can inform the siting and design process. Project surveys should be conducted in as wide a study corridor as possible to enable project siting to minimize environmental impacts.
- All planning survey requirements of this Plan will be followed within the construction corridor (i.e., the limit of project construction plus equipment staging areas and access roads) and the entire road right-of-way. Expanding the survey area beyond the project footprint will help identify covered species and their habitats so that impacts on covered species that occur adjacent to the construction zone can be minimized.
- For certain road projects (see Table 6-6), data collection will be required on wildlife movement through the road study corridor for at least 1 year prior to project design. Wildlife movement will be studied at the site to determine which species move across it, when they move, and, most importantly, which landscape features are most often used. These data will be used to select the most appropriate design requirements for the species and conditions unique to the site (see below).
- Transportation project proponents will consult early with the HCP/NCCP Implementing Entity, CDFG, and USFWS on individual projects to ensure that conceptual designs (siting) and project designs (construction and staging areas) meet the terms of this Plan (Table 6-6).

Design Requirements for Wildlife Movement and Impact Minimization

- Design requirements will be updated or changed by designs shown by the best available science to be more effective at facilitating safe wildlife movement across roads. The effectiveness of road crossings for wildlife is an active area of research, so frequent advances in design are expected throughout the permit term.
- Wildlife crossing needs will be assessed for each road project as a whole (for those projects subject to this provision [see Table 6-6]), not by road segment, and for each wildlife species likely to need to cross the facility (Barnum 2003). Data will be collected on wildlife movements at the proposed project site for at least 1 year. These data will inform the design of wildlife movement structures suitable for the site and the species that use the area.
- **Placement of Undercrossings.** Road undercrossings will be constructed at frequent intervals to allow wildlife movement (see Table 6-6 for applicability). A combination of large structures (bridges, large culverts, or large tunnels) spaced at greater intervals and small structures (small culverts or tunnels) spaced at frequent intervals will be used to accommodate a wide variety of wildlife species. However, placement of undercrossings in areas where wildlife are most likely to use them is more important than maintaining a certain frequency or spacing. Wildlife crossings that serve multiple species should be used whenever possible. Crossing facilities should be installed at known travel routes, natural pinch points[11], or other topographically appropriate locations to maximize the chance of use. Suitable areas may include stream crossings or natural drainages. Undercrossings should be placed at grade whenever possible to maximize their use by wildlife.
- **Use of Bridges.** Bridges, viaducts, or causeways[12] will be used for certain projects (Table 6-6) to minimize impacts on important upland areas, wetlands, streams, and local surface hydrology that feeds wetlands and streams near the road, and to provide the widest and most natural passageways for wildlife (i.e., to allow natural vegetation and physical features to occur in the undercrossing). If possible, bridges will span the bed and bank of streams and avoid or minimize bridge piers or footings within the stream, within bridge safety limits. If possible, the span of bridges that cross streams should also include some upland habitat beneath their spans to provide dry areas for wildlife species that do not use creeks or for use during storms. Native plantings, natural debris, or rocks should be installed under bridges to provide wildlife cover and encourage the use of crossings.
- **Crossing Frequency.** Large wildlife crossings (for medium to large mammals) will be placed approximately once every mile along new or substantially expanded roads that cross wildlife movement routes (see Table 6-6 for applicability). Small wildlife crossings will be placed approximately every 1,000 feet along new or substantially expanded roads. This is the same

[11] A pinch point is a constriction of habitat by a preexisting topographic or other feature such as a steep canyon, urban development, or narrowing band of woodland or scrub.

[12] A viaduct is a long, multi-span bridge over upland habitat; a causeway is the same but often over wetland habitat.

interval of undercrossings suitable for California tiger salamander installed along Vasco Road in the inventory area (65 undercrossings in 13 miles). Within these parameters, undercrossings should be placed where wildlife are most likely to use them, rather than evenly spaced. The required interval can be used as an average if it can be demonstrated that strict adherence to the requirement will not benefit wildlife movement.

- **Culvert Designs.** Tunnels or culverts must be the minimum length, height, and width necessary to provide safe passage under the road. Culvert designs will be based on the best available data at the time. Current thinking recommends that culverts designed for medium-size mammals such as San Joaquin kit fox, coyote, raccoon, be 5–8 feet in diameter (although culverts larger than 8 feet in diameter may be needed for longer crossings). Culverts designed for small mammals are recommended at 18–48 inches in diameter; smaller structures may be preferred by smaller wildlife species. Culverts should, when feasible, provide a natural substrate on which wildlife can travel (e.g., open bottom). It is also recommended that wildlife undercrossings using tunnels or culverts use grating on the inactive part of the roadbed (e.g., road shoulders) to allow filtration of ambient light and moisture but minimize noise intrusion. Artificial lighting inside tunnels or culverts is not recommended; these devices have not been shown to be effective and may deter nocturnal wildlife.

- **Fencing Design.** Fencing will be used along the roadway to direct wildlife to undercrossings and minimize their access to the road (see Table 6-6 for applicability). Fencing designs will be customized for the wildlife expected to use the undercrossing and will be based on the best available data at the time. Fencing must be continuous along the road and must be attached to the undercrossing to facilitate its use. Fencing must also extend well beyond the target undercrossing to reduce the chance of wildlife moving around the fence. For example, four fencing designs have been installed along Vasco Road and monitored for their effectiveness in reducing mortality of California tiger salamanders (Jones & Stokes Associates 1998b, 1999).

  Fencing must be monitored regularly by the applicant and repairs made promptly to ensure effectiveness. Wildlife undercrossings must be at the same or similar elevation as the fencing (e.g., along elevated roadways) to increase chances of their use. Vegetation must be managed along small mammal and amphibian fencing to reduce the opportunity for these species to climb the fence. Fencing designed for small mammal or amphibian exclusion must be installed at least 8 inches deep into the soil to prevent small mammal burrows providing access under the fence.

  Where roads cross the wildlife exclusion fences, gates should be used whenever possible with material at the base of the gate to minimize the gap between the gate and the roadbed. If gates are not feasible, an in-roadway barrier (e.g., wildlife grates or similar devices) or device that channels species away must be installed to deter wildlife from moving around fences into the road.

- **Road Median Designs.** When compatible with vehicle safety, road medians should allow wildlife to cross under or over the median in the event they become trapped on the roadway.

Construction Requirements

The following measures are specifically required for rural road and transportation projects. Other conservation measures described in this Plan for covered activities also apply.

- No erodible materials will be deposited into watercourses. Brush, loose soils, or other debris material will not be stockpiled within stream channels or on adjacent banks.
- All no-take species will be avoided.
- Construction activities will comply with the Migratory Bird Treaty Act and will consider seasonal requirements for birds and migratory non-resident species, including covered species.
- Temporary stream diversions, if required, will use sand bags or other approved methods that minimize instream impacts and effects on wildlife.
- Silt fencing or other sediment trapping method will be installed downgradient from construction activities to minimize the transport of sediment off site.
- Barriers will be constructed to keep wildlife out of construction sites, as appropriate.
- Onsite monitoring will be conducted throughout the construction period to ensure that disturbance limits, BMPs, and Plan restrictions are being implemented properly.
- Active construction areas will be watered regularly to minimize the impact of dust on adjacent vegetation and wildlife habitats, if warranted.

The following construction measure will be applied differently to each rural road project (see Table 6-6).

- Install sturdy lock-boxes for cameras at each large wildlife undercrossing to facilitate wildlife monitoring by the Implementing Entity. Boxes should be at least 1 foot square, include a removable door, and be prewired for electricity (solar, battery, or alternating current). This will provide for the least intrusive, most secure, most flexible, and most cost-effective way to monitor wildlife usage, while minimizing human impacts. Boxes will be mounted on adjustable pedestals to vary the height of the box.

Postconstruction Requirements

- Roadside vegetation within the right-of-way and adjacent to HCP/NCCP Preserves or other open space areas will be controlled to prevent the spread of invasive exotic plants such as yellow star-thistle into nearby or adjacent preserves.

- Vegetation and debris must be managed in and near culverts and under and near bridges to ensure that entryways remain open and visible to wildlife and the passage through the culvert or under the bridge remains clear.
- Cut-and-fill slopes will be revegetated with native, non-invasive nonnative, or non-reproductive (i.e., sterile hybrids) plants suitable for the altered soil conditions.
- All structures constructed for wildlife movement (tunnels, culverts, underpasses, fences) must be monitored at regular intervals and repairs made promptly to ensure that the structure is in proper condition.

Rationale

Road projects in rural natural areas have been shown to have significant adverse effects on some wildlife species (Forman et al. 2002; Irwin et al. 2003). Some rural road projects covered by the HCP/NCCP are expected to have adverse effects on native wildlife as well as some covered species, particularly amphibians and San Joaquin kit fox. In order to meet regulatory requirements under the Plan to avoid and minimize impacts to the maximum extent practicable, this conservation measure was developed in consultation with Contra Costa County transportation planning staff, the HCPA, CDFG, and USFWS. Design guidelines and requirements are based on some of the latest techniques for minimizing impacts of rural road projects (Forman et al. 2002; Irwin et al. 2003; Finch 2004).

6.4.2 Natural Community–Level Measures

Conservation Measure 2.12. Wetland, Pond, and Stream Avoidance and Minimization

Measure

All projects that discharge into or fill waters of the United States, including jurisdictional wetlands, are required to obtain applicable permits from the U.S. Army Corps of Engineers. All projects that discharge into or fill waters of the State, including jurisdictional wetlands, are required to obtain applicable permits from the Regional Water Quality Control Board. Projects that fill streams under the jurisdiction of the State are also required to obtain a streambed alteration agreement with CDFG.

All covered activities will implement the following measures to avoid and minimize impacts of covered activities on wetlands, ponds, streams, and riparian woodland/scrub.

- Like avoidance and minimization measures for terrestrial habitats, this conservation measure is not intended to create small, isolated wetland mitigation sites. Some impacts on aquatic land cover types are expected under the Plan. The intent of the Plan is to concentrate mitigation for filled aquatic features in areas away from urban development and within large

preserves that are linked to existing protected areas. Larger preserves will be more effective for protecting, enhancing, and restoring wetlands. The analysis conducted in this Plan assumes that small, isolated wetlands will not be avoided on projects within the urban development area.

Projects proposing to fill less than 3.0 acres of jurisdictional wetlands and waters do not need additional avoidance analysis beyond that in the HCP/NCCP. Projects proposing to fill greater than 3.0 acres of jurisdictional wetland and waters must conduct a site-specific analysis of avoidance and minimization measures in the wetland delineation report to demonstrate the project avoids and minimizes impacts on these features to the maximum extent practicable. The avoidance and minimization analysis for projects proposing impacts on more than 3.0 acres of jurisdictional wetlands and waters must be reviewed and approved by the Implementing Entity for projects within the UDA or by CDFG and USFWS for projects outside the UDA, consistent with the regional avoidance accomplished by the HCP/NCCP.

Any regional permit program for aquatic resources that is subsequently adopted by the U.S. Army Corps of Engineers, Regional Water Quality Control Board, or CDFG will contain avoidance and minimization requirements. Those requirements may differ from the avoidance and minimization requirements in this Plan.

- Applicants with streams on site must follow the stream setback requirements in Conservation Measure 1.7.
- Applicants for coverage under the HCP/NCCP must follow the guidelines in Conservation Measure 1.10 to minimize the effects of urban development on downstream hydrology, streams, and wetlands.
- All wetlands, ponds, streams, and riparian woodland/scrub to be avoided by covered activities will be temporarily staked in the field by a qualified biologist.
- Buffer zones should be established where feasible between the aquatic resource and development. Required setbacks for streams are described in Conservation Measure 1.7. Credit for preservation of aquatic habitat will be given only if these features meet minimum distances from dense urban development (see Table 5-6).
- Fencing will be erected between the outer edge of the buffer zone and the project area. The type of fencing will match the activity and impact types. For example, projects that have the potential to cause erosion will require erosion control barriers (see below), and projects that may bring more household pets to a site should be fenced to keep the pets out. The temporal requirements for fencing also depend on the activity and impact type. For example, fencing for permanent impacts should be permanent, and fencing for short-term impacts should be removed after the activity is completed.
- Personnel conducting ground-disturbing activities within or adjacent to the buffer zone of wetlands, ponds, streams, or riparian woodland/scrub will be trained by a qualified biologist in these avoidance and minimization

measures and the permit obligations of project proponents working under this HCP/NCCP. Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas.

- Trash generated by covered activities will be promptly and properly removed from the site.
- No construction or maintenance vehicles will be refueled within 200 feet of wetlands, ponds, streams, or riparian woodland/scrub unless a bermed and lined refueling area is constructed and hazardous material absorbent pads are available in the event of a spill.
- Appropriate erosion-control measures (e.g., fiber rolls, filter fences, vegetative buffer strips) will be used on site to reduce siltation and runoff of contaminants into wetlands, ponds, streams, or riparian woodland/scrub. Filter fences and mesh will be of material that will not entrap reptiles and amphibians. Erosion control blankets shall be used as a last resort because of their tendency to biodegrade slowly and trap reptiles and amphibians. Erosion-control measures will be placed between the outer edge of the buffer and the project site.
- Fiber rolls used for erosion control will be certified as free of noxious weed seed.
- Seed mixtures applied for erosion control will not contain invasive nonnative species, and will be composed of native species or sterile nonnative species.
- Where feasible, stream crossings will be located in stream segments without riparian vegetation, and bridge footings will be built outside the stream banks (i.e., clear span structures).
- Herbicide will not be applied within 100 feet of wetlands, ponds, streams, or riparian woodland/scrub; however, where appropriate to control serious invasive plants, herbicides that have been approved for use by EPA in or adjacent to aquatic habitats may be used as long as label instructions are followed and applications avoid or minimize impacts on covered species and their habitats. In seasonal or intermittent stream or wetland environments, appropriate herbicides may be applied during the dry season to control nonnative invasive species (e.g., yellow star-thistle). Herbicide drift should be minimized by applying the herbicide as close to the target area as possible.

Rationale

Avoidance and minimization measures are required to meet the biological objectives of the HCP/NCCP to avoid and minimize effects on wetlands, ponds, streams, and riparian woodland/scrub. Because of the sensitivity of these aquatic land cover types, special avoidance and minimization measures are necessary.

6.4.3 Species-Level Measures

A summary of the species-level planning surveys, preconstruction surveys, and construction monitoring requirements is provided in Table 6-1.

Townsend's Big-Eared Bat

Identify suitable habitat for Townsend's big-eared bat and determine presence/absence. Prior to initiating covered activities, survey for Townsend's big-eared bat as described below.

Planning Surveys

If initial planning surveys indicate suitable breeding or roosting habitat for Townsend's big-eared bat, a USFWS/CDFG–approved biologist will examine the site to determine if it is occupied by Townsend's big-eared bat. If occupied breeding or roosting habitat is identified, the project proponent will avoid and minimize impacts to the maximum extent practicable. Avoidance measures should include relocating impacts away from the occupied habitat or delaying the impacts until the bats vacate the site. Avoidance and minimization measures will be incorporated into the project design and other portions of the application package prior to submission for coverage under the Plan. If project does not fully avoid impacts to suitable habitat, preconstruction surveys will be required.

Preconstruction Surveys

If the project does not avoid impacts to suitable habitat for Townsend's big-eared bat, a preconstruction survey is required to determine whether the sites are occupied immediately prior to construction or whether they show signs of recent previous occupation. Preconstruction surveys are used to determine what avoidance and minimization requirements are triggered before construction and whether construction monitoring is necessary.

Avoidance and Minimization

If the species is discovered or if evidence of recent prior occupation is established, construction will be scheduled such that it minimizes impacts on Townsend's big-eared bat. Hibernation sites with evidence of prior occupation will be sealed before the hibernation season (November–March), and nursery sites will be sealed before the nursery season (April–August). If the site is occupied, then the action will occur either prior to or after the hibernation season for hibernacula and after August 15 for nursery colonies. Construction will not take place as long as the site is occupied.

The locations of all suitable or occupied microhabitat within the inventory area are not known due to survey and mapping limitations. Hibernacula or nursery sites may be located during planning or preconstruction surveys. Avoiding impacts on occupied sites during sensitive periods will minimize disturbance or direct mortality as a result of covered activities, and sealing sites prior to construction will allow bats to reestablish elsewhere.

San Joaquin Kit Fox

To avoid or minimize direct impacts on San Joaquin kit fox as a result of covered activities, the following procedures will be implemented. This program was based on the USFWS *Standardized Recommendations for Protection of the San Joaquin Kit Fox prior to or during Ground Disturbance* (U.S. Fish and Wildlife Service 1999).

Planning Surveys

A USFWS/CDFG–approved biologist will identify potential breeding or denning habitat for kit fox (Section 6.3.1, *Planning Surveys*). If the project does not fully avoid impacts to suitable breeding and denning habitat, preconstruction surveys will be required.

Preconstruction Surveys

Prior to any ground disturbance related to covered activities, a USFWS/CDFG–approved biologist will conduct a preconstruction survey in areas identified in the planning surveys as supporting suitable breeding or denning habitat for San Joaquin kit fox. The surveys will establish the presence or absence of San Joaquin kit foxes and/or suitable dens and evaluate use by kit foxes in accordance with USFWS survey guidelines (U.S. Fish and Wildlife Service 1999). Preconstruction surveys will be conducted within 30 days of ground disturbance. On the parcel where the activity is proposed, the biologist will survey the proposed disturbance footprint and a 250-foot radius from the perimeter of the proposed footprint to identify San Joaquin kit foxes and/or suitable dens. Adjacent parcels under different land ownership will not be surveyed. The status of all dens will be determined and mapped. Written results of preconstruction surveys will be submitted to USFWS within 5 working days after survey completion and before the start of ground disturbance. Concurrence is not required prior to initiation of covered activities.

If San Joaquin kit foxes and/or suitable dens are identified in the survey area, the measures described below will be implemented.

Avoidance and Minimization Requirements

- If a San Joaquin kit fox den is discovered in the proposed development footprint, the den will be monitored for 3 days by a USFWS/CDFG–approved biologist using a tracking medium or an infrared beam camera to determine if the den is currently being used.
- Unoccupied dens should be destroyed immediately to prevent subsequent use.
- If a natal or pupping den is found, USFWS and CDFG will be notified immediately. The den will not be destroyed until the pups and adults have vacated and then only after further consultation with USFWS and CDFG.
- If kit fox activity is observed at the den during the initial monitoring period, the den will be monitored for an additional 5 consecutive days from the time of the first observation to allow any resident animals to move to another den while den use is actively discouraged. For dens other than natal or pupping dens, use of the den can be discouraged by partially plugging the entrance with soil such that any resident animal can easily escape. Once the den is determined to be unoccupied it may be excavated under the direction of the biologist. Alternatively, if the animal is still present after 5 or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant (i.e., during the animal's normal foraging activities).

Construction Monitoring

If dens are identified in the survey area outside the proposed disturbance footprint, exclusion zones around each den entrance or cluster of entrances will be demarcated. The configuration of exclusion zones should be circular, with a radius measured outward from the den entrance(s). No covered activities will occur within the exclusion zones. Exclusion zone radii for potential dens will be at least 50 feet and will be demarcated with four to five flagged stakes. Exclusion zone radii for known dens will be at least 100 feet and will be demarcated with staking and flagging that encircles each den or cluster of dens but does not prevent access to the den by kit fox.

Golden Eagle

To avoid or minimize direct impacts on golden eagle as a result of covered activities, the following procedures will be implemented.

Planning Surveys

A USFWS/CDFG–approved biologist will identify potential active nests of golden eagle. If nests are identified, the project proponent will avoid and

minimize impacts to the maximum extent practicable. Avoidance measures should include relocating impacts away from the nest. Avoidance and minimization measures will be incorporated into the project design and other portions of the application package prior to submission for coverage under the Plan. If project does not fully avoid impacts on nests and nest trees, preconstruction surveys will be required.

Preconstruction Survey

Prior to implementation of covered activities, a qualified biologist will conduct a preconstruction survey to establish whether nests of golden eagles are occupied (see Section 6.3.1, *Planning Surveys*). If nests are occupied, minimization requirements and construction monitoring will be required.

Avoidance and Minimization

Covered activities will be prohibited within 0.5 mile of active nests. Nests can be built and active at almost any time of the year, although mating and egg incubation occurs late January through August, with peak activity in March through July. If site-specific conditions or the nature of the covered activity (e.g., steep topography, dense vegetation, limited activities) indicate that a smaller buffer could be appropriate or that a larger buffer should be implemented, the Implementing Entity will coordinate with CDFG/USFWS to determine the appropriate buffer size.

Construction Monitoring

Construction monitoring will focus on ensuring that no covered activities occur within the buffer zone established around an active nest. Although no known golden eagle nest sites occur within or near the ULL, covered activities inside and outside of the Preserve System have the potential to disturb golden eagle nest sites. Construction monitoring will ensure that direct effects to golden eagles are minimized.

Western Burrowing Owl

Determine whether western burrowing owls utilize artificial burrows and artificial perches. Prior to initiating covered activities, conduct surveys for burrowing owl as described below. This measure incorporates avoidance and minimization guidelines from CDFG's *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 1995).

Planning Surveys

A USFWS/CDFG–approved biologist will identify potential burrowing owl breeding habitat (Section 6.3.1, *Planning Surveys*). If project does not fully avoid impacts to suitable breeding habitat, preconstruction surveys will be required.

Preconstruction Surveys

Prior to any ground disturbance related to covered activities, a USFWS/CDFG-approved biologist will conduct a preconstruction survey in areas identified in the planning surveys as having potential burrowing owl habitat. The surveys will establish the presence or absence of western burrowing owl and/or habitat features and evaluate use by owls in accordance with CDFG survey guidelines (California Department of Fish and Game 1993).

On the parcel where the activity is proposed, the biologist will survey the proposed disturbance footprint and a 500-foot radius from the perimeter of the proposed footprint to identify burrows and owls. Adjacent parcels under different land ownership will not be surveyed. Surveys should take place near sunrise or sunset in accordance with CDFG guidelines. All burrows or burrowing owls will be identified and mapped. Surveys will take place no more than 30 days prior to construction. During the breeding season (February 1–August 31), surveys will document whether burrowing owls are nesting in or directly adjacent to disturbance areas. During the nonbreeding season (September 1–January 31), surveys will document whether burrowing owls are using habitat in or directly adjacent to any disturbance area. Survey results will be valid only for the season (breeding or nonbreeding) during which the survey is conducted.

Avoidance and Minimization and Construction Monitoring

If burrowing owls are found during the breeding season (February 1–August 31), the project proponent will avoid all nest sites that could be disturbed by project construction during the remainder of the breeding season or while the nest is occupied by adults or young. Avoidance will include establishment of a non-disturbance buffer zone (described below). Construction may occur during the breeding season if a qualified biologist monitors the nest and determines that the birds have not begun egg-laying and incubation or that the juveniles from the occupied burrows have fledged. During the nonbreeding season (September 1–January 31), the project proponent should avoid the owls and the burrows they are using, if possible. Avoidance will include the establishment of a buffer zone (described below).

If occupied burrows for burrowing owls are not avoided, passive relocation will be implemented. Owls should be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors in

burrow entrances. These doors should be in place for 48 hours prior to excavation. The project area should be monitored daily for 1 week to confirm that the owl has abandoned the burrow. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation (California Department of Fish and Game 1995). Plastic tubing or a similar structure should be inserted in the tunnels during excavation to maintain an escape route for any owls inside the burrow.

Swainson's Hawk

Prior to initiating covered activities, conduct surveys for Swainson's hawk nest sites as described below.

Planning Surveys

A USFWS/CDFG–approved biologist will inspect all large trees with binoculars to document whether Swainson's hawk nests occur on site (Section 6.3.1, *Planning Surveys*). Survey will be conducted according to the Swainson's Hawk Technical Advisor Committee's methodology (May 31, 2000) or updated methodologies as issued by USFWS or CDFG. If occupied nests are identified, the project proponent will avoid and minimize impacts to these nests in compliance with the Migratory Bird Treaty Act and the Fish and Game Code (Section 3503). Avoidance and minimization measures will be incorporated into the project design and other portions of the application package prior to submission for coverage under the Plan. Avoidance measures will include preserving the nest tree. If project construction occurs during the nesting season (March 15–September 15), a preconstruction survey will be required.

Preconstruction Survey

Prior to any ground disturbance related to covered activities that occurs during the nesting season (March 15–September 15), a qualified biologist will conduct a preconstruction survey no more than 1 month prior to construction to establish whether Swainson's hawk nests within 1,000 feet of the project site are occupied. If potentially occupied nests within 1,000 feet are off the project site, then their occupancy will be determined by observation from public roads or by observations of Swainson's hawk activity (e.g., foraging) near the project site. If nests are occupied, minimization measures and construction monitoring are required (see below).

Avoidance and Minimization and Construction Monitoring

During the nesting season (March 15–September 15), covered activities within 1,000 feet of occupied nests or nests under construction will be prohibited to

prevent nest abandonment. If site-specific conditions or the nature of the covered activity (e.g., steep topography, dense vegetation, limited activities) indicate that a smaller buffer could be used, the Implementing Entity will coordinate with CDFG/USFWS to determine the appropriate buffer size.

If young fledge prior to September 15, covered activities can proceed normally. If the active nest site is shielded from view and noise from the project site by other development, topography, or other features, the project applicant can apply to the Implementing Entity for a waiver of this avoidance measure. Any waiver must also be approved by USFWS and CDFG. While the nest is occupied, activities outside the buffer can take place.

All active nest trees will be preserved on site, if feasible. Nest trees, including non-native trees, lost to covered activities will be mitigated by the project proponent according to the requirements below.

Mitigation for Loss of Nest Trees

The loss of non-riparian Swainson's hawk nest trees will be mitigated by the project proponent by:

- If feasible on-site, planting 15 saplings for every tree lost with the objective of having at least 5 mature trees established for every tree lost according to the requirements listed below.

  AND either

  1. Pay the Implementing Entity an additional fee to purchase, plant, maintain, and monitor 15 saplings on the HCP/NCCP Preserve System for every tree lost according to the requirements listed below, OR

  2. The project proponent will plant, maintain, and monitor 15 saplings for every tree lost at a site to be approved by the Implementing Entity (e.g., within an HCP/NCCP Preserve or existing open space linked to HCP/NCCP preserves), according to the requirements listed below.

The following requirements will be met for all planting options:

- Tree survival shall be monitored at least annually for 5 years, then every other year until year 12. All trees lost during the first 5 years will be replaced. Success will be reached at the end of 12 years if at least 5 trees per tree lost survive without supplemental irrigation or protection from herbivory. Trees must also survive for at least three years without irrigation.
- Irrigation and fencing to protect from deer and other herbivores may be needed for the first several years to ensure maximum tree survival.
- Native trees suitable for this site should be planted. When site conditions permit, a variety of native trees will be planted for each tree lost to provide

trees with different growth rates, maturation, and life span, and to provide a variety of tree canopy structures for Swainson's hawk. This variety will help to ensure that nest trees will be available in the short term (5-10 years for cottonwoods and willows) and in the long term (e.g., Valley oak, sycamore). This will also minimize the temporal loss of nest trees.

- Riparian woodland restoration conducted as a result of covered activities (i.e., loss of riparian woodland) can be used to offset the nest tree planting requirement above, if the nest trees are riparian species.
- Whenever feasible and when site conditions permit, trees should be planted in clumps together or with existing trees to provide larger areas of suitable nesting habitat and to create a natural buffer between nest trees and adjacent development (if plantings occur on the development site).
- Whenever feasible, plantings on the site should occur closest to suitable foraging habitat outside the UDA.
- Trees planted in the HCP/NCCP preserves or other approved offsite location will occur within the known range of Swainson's hawk in the inventory area and as close as possible to high-quality foraging habitat.

Giant Garter Snake

Planning Survey

A USFWS/CDFG–approved biologist will identify suitable giant garter snake habitat (Section 6.3.1, *Planning Surveys*). If suitable habitat is identified, the project proponent will avoid and minimize impacts to the maximum extent practicable. Avoidance measures should include relocating impacts away from the habitat. Avoidance and minimization measures will be incorporated into the project design and other portions of the application package prior to submission for coverage under the Plan. If project does not fully avoid impacts to suitable habitat, preconstruction surveys will be required.

Preconstruction Surveys

Prior to any ground disturbance related to covered activities, a USFWS/CDFG–approved biologist will conduct a preconstruction survey in areas identified in the planning surveys as having suitable garter snake habitat and 200 feet of adjacent uplands, measured from the outer edge of each bank. The surveys will delineate suitable habitat and document any sightings of giant garter snake.

Avoidance and Minimization Requirements

To the maximum extent practicable, impacts on giant garter snake habitat as a result of covered activities will be avoided. If feasible, in areas near construction

activities, a buffer of 200 feet from suitable habitat will be delineated within which vegetation disturbance or use of heavy equipment is prohibited.

If impacts on giant garter snake habitat as a result of covered activities are not avoided, the following measures will be implemented. These measures are based on USFWS's *Standard Avoidance and Minimization Measures during Construction Activities in Giant Garter Snake Habitat* (U.S. Fish and Wildlife Service 1999).

- Limit construction activity that disturbs habitat to the period between May 1 and September 30. This is the active period for giant garter snake, and direct mortality is minimized because snakes are more likely to independently move away from disturbed area. If activities are necessary in giant garter snake habitat between October 1 and April 30, the USFWS Sacramento Field Office will be contacted to determine if additional measures beyond those described below are necessary to minimize and avoid take.
- In areas where construction is to take place, dewater all irrigation ditches, canals or other aquatic habitat between April 15 and September 30 to remove habitat of garter snakes. Dewatered areas must remain dry, with no puddled water remaining, for at least 15 consecutive days prior to the excavation or filling of that habitat. If a site cannot be completely dewatered, netting and salvage of prey items may be necessary.

Construction Monitoring

If suitable habitat for giant garter snake cannot be avoided between October 1 and April 30 the USFWS Sacramento Field Office will be contacted to determine if additional measures beyond those described below are necessary, and the following actions will be performed. A USFWS-approved biologist will conduct a construction survey no more than 24 hours before construction in suitable habitat and will be on site during construction activities in potential aquatic and upland habitat to ensure that individuals of giant garter snake encountered during construction will be avoided. The biologist will provide USFWS with a field report form documenting the monitoring efforts within 24 hours of commencement of construction activities. The monitor will be available thereafter. If a snake is encountered during construction activities, the monitor will have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. Giant garter snakes encountered during construction activities should be allowed to move away from the construction area on their own. Only personnel with a USFWS recovery permit pursuant to Section 10(a)(1)(A) of the ESA will have the authority to capture and/or relocate giant garter snakes that are encountered in the construction area. The project area will be reinspected whenever a lapse in construction activity of 2 weeks or more has occurred.

To ensure that construction equipment and personnel do not affect nearby aquatic habitat for giant garter snake outside construction areas, silt fencing will be erected to clearly define the aquatic habitat to be avoided; restrict working areas,

spoils, and equipment storage and other project activities to areas outside of aquatic or wetland habitat; and maintain water quality and limit construction runoff into wetland areas through the use of fiber bales, filter fences, vegetation buffer strips, or other appropriate methods.

Fill or construction debris may be used by giant garter snakes as over-wintering sites. Therefore, upon completion of construction activities, any temporary fill or construction debris must be removed from the site.

Construction personnel will be trained to avoid harming giant garter snakes. A qualified biologist approved by USFWS will inform all construction personnel about the life history of giant garter snakes; the importance of irrigation canals, marshes/wetlands, and seasonally flooded areas such as rice fields to giant garter snakes; and the terms and conditions of the Plan related to avoiding and minimizing impacts on giant garter snake.

California Tiger Salamander

Planning Surveys

A USFWS/CDFG–approved biologist will identify potential breeding habitat for California tiger salamander. If the project fills or surrounds suitable breeding habitat, the project proponent will notify USFWS, CDFG, and the Implementing Entity of the presence and condition of potential breeding habitat, as described below. No preconstruction surveys are required.

Minimization

Written notification to USFWS, CDFG, and the Implementing Entity, including photos and breeding habitat assessment, is required prior to disturbance of any suitable breeding habitat. The project proponent will also notify these parties of the approximate date of removal of the breeding habitat at least 30 days prior to this removal to allow USFWS or CDFG staff to translocate individuals, if requested. USFWS or CDFG must notify the project proponent of their intent to translocate California tiger salamanders within 14 days of receiving notice from the project proponent. The applicant must allow USFWS or CDFG access to the site prior to construction if they request it.

There are no restrictions under this Plan on the nature of the disturbance or the date of the disturbance unless CDFG or USFWS notify the project proponent of their intent to translocate individuals within the required time period. In this case, the project proponent must coordinate the timing of disturbance of the breeding habitat to allow USFWS or CDFG to translocate the individuals. USFWS and CDFG shall be allowed 45 days to translocate individuals from the date the first written notification was submitted by the project proponent (or a longer period agreed to by the project proponent, USFWS, and CDFG).

California Red-legged Frog

Planning Surveys

A USFWS/CDFG–approved biologist will identify potential red-legged frog breeding habitat (Section 6.3.1, *Planning Surveys*). If the project fills or surrounds suitable breeding habitat, the project proponent will notify USFWS, CDFG, and the Implementing Entity of the presence and condition of potential breeding habitat, as described below. No preconstruction surveys are required.

Minimization

Written notification to USFWS, CDFG, and the Implementing Entity, including photos and habitat assessment, is required prior to disturbance of any suitable breeding habitat. The project proponent will also notify these parties of the approximate date of removal of the breeding habitat at least 30 days prior to this removal to allow USFWS or CDFG staff to translocate individuals, if requested. USFWS or CDFG must notify the project proponent of their intent to translocate California red-legged frog within 14 days of receiving notice from the project proponent. The applicant must allow USFWS or CDFG access to the site prior to construction if they request it.

There are no restrictions under this Plan on the nature of the disturbance or the date of the disturbance unless CDFG or USFWS notify the project proponent of their intent to translocate individuals within the required time period. In this case, the project proponent must coordinate the timing of disturbance of the breeding habitat to allow USFWS or CDFG to translocate the individuals. USFWS and CDFG shall be allowed 45 days to translocate individuals from the date the first written notification was submitted by the project proponent (or a longer period agreed to by the project proponent, USFWS, and CDFG).

Covered Shrimp

Planning Surveys

A USFWS/CDFG–approved biologist will identify potential habitat for covered shrimp species. Suitable habitat is defined in the species profiles for each shrimp species (Appendix D). (Note that the understanding of suitable habitat for each species may change as more occurrences are discovered and additional research is conducted.) If suitable habitat is identified, project proponents will avoid and minimize impacts to the maximum extent practicable. Avoidance measures should include relocating impacts away from the suitable habitat. Avoidance and minimization measures will be incorporated into the project design and other portions of the application package prior to submission for coverage under the Plan. If project does not fully avoid impacts to suitable habitat, preconstruction surveys will be required. If surveys determine that the habitat is occupied,

project proponents must compensate for the loss of this habitat as described in Conservation Measure 3.8. Project proponents have the option to forgo the following survey, avoidance, and minimization requirements by assuming that suitable habitat is occupied and compensating for the loss of this habitat as described in Conservation Measure 3.8.

Preconstruction Survey

Prior to any ground disturbance related to covered activities, a USFWS-approved biologist will conduct a preconstruction survey in areas identified in the planning surveys as having suitable shrimp habitat. The surveys will establish the presence or absence of covered shrimp and/or habitat features and evaluate use by listed shrimp in accordance with modified USFWS survey guidelines (U.S. Fish and Wildlife Service 1996b). Project proponents are required to conduct USFWS protocol surveys in one year (rather than two) to determine presence or absence of listed shrimp species. If covered shrimp are absent from the site, there are no further requirements related to covered shrimp. If covered shrimp are present, the following avoidance and minimization and construction monitoring measures are required.

Avoidance and Minimization Requirements

To the maximum extent practicable, impacts on occupied habitat of covered shrimp will be avoided by implementing the following measures based on existing mitigation standards (U.S. Fish and Wildlife Service 1996a).

- If suitable habitat for covered shrimp will be retained on site, establish a buffer (described below) from the outer edge of all hydric vegetation associated with seasonal wetlands occupied by covered shrimp. Alternatively, at the request of the project proponent, representatives of the Implementing Entity and USFWS may conduct site visits to inspect the particular characteristics of specific project sites and may approve reductions of the buffer. Buffer reductions may be approved for all or portions of the site whenever reduced setbacks will maintain the hydrology of the seasonal wetland and achieve the same or greater habitat values as would be achieved by the original buffer.
- Activities inconsistent with the maintenance of seasonal wetlands within the buffers and disturbance of the onsite watershed will be prohibited. Inconsistent activities include altering existing topography; placing new structures within the buffers; dumping, burning, and/or burying garbage or any other wastes or fill materials; building new roads or trails; removing or disturbing existing native vegetation; installing storm drains; and using pesticides or other toxic chemicals.
- Filling of seasonal wetlands, if unavoidable, will be delayed until pools are dry and samples from the top 4 inches of wetland soils are collected. Soil collection will be sufficient to include a representative sample of plant and

animal life present in the wetland by incorporating seeds, cysts, eggs, spores, and similar inocula. The amount of soil collected will be determined by the size of the wetland filled and the variation in physical and biological conditions within the wetland. The number and size of samples will be sufficient to capture this variation. For very small wetlands it may be most cost effective to simply collect all topsoil. These samples will be provided to the Implementing Entity so that the soil can be translocated to suitable habitat within the inventory area unoccupied by covered shrimp or used to inoculate newly created seasonal wetlands on preserve lands.

- Seasonal wetlands occupied by covered shrimp that are filled will be offset by preserving or acquiring seasonal wetlands occupied by the covered shrimp species and restoring habitat suitable for the covered shrimp species in accordance with Conservation Measure 3.8. Such mitigation will supercede requirements for mitigation of impacts on wetland habitat when covered species are present.

Construction Monitoring

If suitable habitat for covered shrimp will be retained on site, project proponents will establish a buffer from the outer edge of all hydric vegetation associated with seasonal wetlands occupied (or assumed to be occupied) by covered shrimp. This buffer zone will be determined in the field by the biologists as the immediate watershed feeding the seasonal wetland or a minimum of 50 feet, whichever is greater. Buffers will be marked by brightly colored fencing or flagging throughout the construction process. Activities will be prohibited within this buffer in accordance with the minimization measure above.

Construction personnel will be trained to avoid affecting shrimp. A qualified biologist approved by USFWS will inform all construction personnel about the life history of covered shrimp, the importance of avoiding their habitat, and the terms and conditions of the HCP/NCCP related to avoiding and minimizing impacts on covered shrimp.

Covered Plants

Conservation Measure 3.10. Plant Salvage when Impacts are Unavoidable

Measure

Perennial Covered Plants

Where impacts on covered plant species cannot be avoided and plants will be removed by approved covered activities, the Implementing Entity has the option of salvaging the covered plants. Salvage methods for perennial species will be tested for whole individuals, cuttings, and seeds. Salvage measures will include the evaluation of techniques for transplanting as well as germinating seed in garden or greenhouse and then transplanting to suitable habitat sites in the field.

Techniques will be tested for each species, and appropriate methods will be identified through research and adaptive management. Where plants are transplanted or seeds distributed to the field they will be located in preserves in suitable habitat to establish new populations. Field trials will be conducted to evaluate the efficacy of different methods and determine the best methods to establish new populations. New populations will be located such that they constitute separate populations and do not become part of an existing population of the species, as measured by the potential for genetic exchange among individuals through pollen or propagule (e.g., seed, fruit) dispersal. Transplanting within the preserves will only minimally disturb existing native vegetation and soils. Supplemental watering may be provided as necessary to increase the chances of successful establishment, but must be removed following initial population establishment. See also *All Covered Plants* below.

Annual Covered Plants

For annual covered plants, mature seeds will be collected from all individuals for which impacts cannot be avoided (or if the population is large, a representative sample of individuals). If storage is necessary, seed storage studies will be conducted to determine the best storage techniques for each species. If needed, studies will be conducted on seed germinated and plants grown to maturity in garden or greenhouse to propagate larger numbers of seed. Seed propagation methods will ensure that genetic variation is not substantially affected by propagation (i.e., selection for plants best adapted to cultivated conditions). Field studies will be conducted through the Adaptive Management Program to determine the efficacy and best approach to dispersal of seed into suitable habitat. Where seeds are distributed to the field, they will be located in preserves in suitable habitat to establish new populations. If seed collection methods fail (e.g., due to excessive seed predation by insects), alternative propagation techniques will be necessary. See also *All Covered Plants* below.

All Covered Plants

All salvage operations will be conducted by the Implementing Entity. To ensure enough time to plan salvage operations, project proponents will notify the Implementing Entity of their schedule for removing the covered plant population.

The Implementing Entity may conduct investigations into the efficacy of salvaging seeds from the soil seed bank for both perennial and annual species. The soil seed bank may add to the genetic variability of the population. Covered species may be separated from the soil though garden/greenhouse germination or other appropriate means. Topsoil taken from impact sites will not be distributed into preserves because of the risk of spreading new nonnative and invasive plants to preserves.

The Implementing Entity will transplant new populations such that they constitute separate populations and do not become part of an existing population of the species, as measured by the potential for genetic exchange among individuals through pollen or propagule (e.g., seed, fruit) dispersal. Transplanting or seeding “receptor” sites (i.e., habitat suitable for establishing a new population) should be carefully selected on the basis of physical, biological,

and logistical considerations (Fiedler and Laven 1996); some examples of these are listed below.

- Historic range of the species.
- Soil type.
- Soil moisture.
- Topographic position, including slope and aspect.
- Site hydrology.
- Mycorrhizal associates (this may be important for Mount Diablo manzanita).
- Presence or absence of typical associated plant species.
- Presence or absence of herbivores or plant competitors.
- Site accessibility for establishment, monitoring, and protection from trampling by cattle or trail users.

Rationale

For most rare plant species, transplanting efforts have a high failure rate in California (Howald 1996). Transplanting or seeding to establish new populations is a last resort where the loss of covered plant populations is unavoidable. For all species, transplanting and seeding serve as experimental techniques that constitute an additional mitigation measure beyond bringing existing populations of the species under protection within new preserves (Conservation Measure 1.1).

Transplanting and seeding should be used when studies and test trials have shown that the effort has a reasonable chance for success and that the new population can provide a substantial benefit to the species as a whole.

Chapter 6
Tables

Table 6-1. Summary of Survey Requirements and Best Management Practices for Key Covered Wildlife Species

Land-Cover Type	Specific Habitat Elements	Species	Requirements			
			Planning Survey[1]	Preconstruction Survey	Best Management Practices	Construction Monitoring
Grasslands, Oak Savanna, Agriculture	None	San Joaquin kit fox	▪ Identify and map potential habitat within modeled range in the inventory area	▪ Establish presence/absence ▪ Determine status and map all dens (>5 in. diameter)	▪ Monitor dens ▪ Destroy unoccupied dens ▪ Discourage use of occupied (non-natal) dens	▪ Establish exclusion zones (>50 ft) for potential and atypical dens ▪ Establish exclusion zones (>100 ft) for known dens ▪ Notify USFWS of any occupied natal dens
		Western burrowing owl	▪ Identify and map potential habitat	▪ Establish presence/absence (pellets, whitewash, prey remains) ▪ Determine status and map all burrows ▪ Document use of habitat (e.g., breeding, foraging)	▪ Avoid occupied nests during breeding season (Feb–Sep) ▪ Avoid occupied burrows during nonbreeding season (Sep–Feb) ▪ Install one-way doors in occupied burrow (if avoidance not possible) ▪ Monitor burrows with doors installed	▪ Establish buffer zones (250 ft) around nests ▪ Establish buffer zones (160 ft) around burrows
Aquatic (ponds, wetlands, streams and marshes)	▪ Aquatic habitat accessible from San Joaquin River (including sloughs, irrigation and drainage canals, ponds, low-gradient streams)	Giant garter snake	▪ Identify and map potential habitat	▪ Delineate aquatic habitat up to 200 ft from water's edge on each side ▪ Document any occurrences	▪ Limit construction to Oct–May ▪ Dewater habitat April 15–Sep 30 prior to construction ▪ Minimize clearing for construction	▪ Delineate 200-ft buffer around potential habitat near construction ▪ Provide field report on monitoring efforts ▪ Stop construction activities if snake is encountered; allow snake to passively relocate ▪ Remove temporary fill or debris from construction site ▪ Construction personnel must participate in training

Table 6-1. Continued

Land-Cover Type	Specific Habitat Elements	Species	Requirements			
			Planning Survey[1]	Preconstruction Survey	Best Management Practices	Construction Monitoring
	▪ Ponds and wetlands in grassland, oak savanna, oak woodland ▪ Vernal pools ▪ Reservoirs ▪ Small lakes	California tiger salamander	▪ Identify and map potential breeding habitat ▪ Document habitat quality and features ▪ Provide IE with photo-documentation and report	▪ Provide written notification to FWS and DFG regarding timing of construction and likelihood of occurrence on site	▪ Allow agency staff to translocate species, if requested	▪ None
	▪ Slow-moving streams, ponds, or marshes	California red-legged frog	▪ Identify and map potential breeding habitat ▪ Document habitat quality and features ▪ Provide IE with photo-documentation and report	▪ Provide written notification to FWS and DFG regarding timing of construction and likelihood of occurrence on site	▪ Allow agency staff to translocate species, if requested	▪ None
Seasonal Wetlands	▪ Vernal pools, ▪ Sandstone rock outcrops, or ▪ Sandstone depressions	Covered shrimp	▪ Identify and map potential breeding habitat	▪ Establish presence/absence ▪ Document and evaluate use of all habitat features (e.g. vernal pools, rock outcrops)	▪ Establish a buffer near construction activities ▪ Prohibit incompatible activities ▪ Any filling of vernal pools (requires separate permit) must take place after pools are dry and sampling completed ▪ Collect and provide soils for storage by IE	▪ Establish buffer around outer edge of all hydric vegetation associated with habitat ▪ Buffer is 50 feet or the limit of the immediate watershed supporting the seasonal wetland, whichever is larger ▪ Construction personnel must participate in training

Table 6-1. Continued

Land-Cover Type	Specific Habitat Elements	Species	Requirements			
			Planning Survey[1]	Preconstruction Survey	Best Management Practices	Construction Monitoring
Any	▪ Rock formations with caves, ▪ Mines, ▪ Buildings	Townsend's big-eared bat	▪ Map and document potential breeding/roosting habitat	▪ Establish presence/absence ▪ Determine if potential sites were recently occupied (guano)	▪ Seal hibernacula before November ▪ Seal nursery sites before April ▪ Delay construction near occupied sites until the hibernation or nursery seasons are over	▪ None
	▪ Potential nest sites (trees within species range usually below 200 ft. in elevation)	Swainson's hawk	▪ Inspect large trees for presence/absence of nest sites	▪ Determine whether potential nests are occupied	▪ No construction within 1,000 feet of occupied nests within breeding season (March 15–Sep 15) ▪ If necessary, remove active nest tree after nesting season to prevent occupancy in second year	▪ Establish 1,000-foot buffer around active nest and monitoring compliance
	▪ Potential nest sites (secluded cliffs with overhanging ledges; large trees)	Golden eagle	▪ Document and map potential nests	▪ Establish presence/absence of nesting eagles	▪ No construction within ½ mile near active nests (most activity late January through August)	▪ Establish ½ mile buffer around active nest and monitor compliance

[1] Changes to project design that result from planning survey information will help avoid impacts to covered species

Table 6-2. Stream Setback Requirements for Streams within the Urban Development Area

Stream Reach Type and Location[1]	Buffer Objective/ Function (from Figure 5-11)	Example Sites in Inventory Area	Required Setback (from top of bank measured in aerial perspective[2])	Limitations On Exceptions To Setback Requirements That May Be Granted By Local Agencies			Comments
				Maximum Allowable Linear Impact to Streams[3] (per project)	Activities Eligible For Streams Impact Exception	Maximum Allowable Area of Impact Within Setback[4] (per project)	
1st and 2nd order[5] ephemeral reaches in urban and agricultural areas	N/A	Multiple unnamed tributaries to intermittent and perennial reaches	Avoidance and minimization measures for drainages must be documented but no setback is required	No limitations[3]	Any activities	No limitations[4]	These reaches are located in dense urban and intensive agricultural areas, and provide low habitat function for covered species. Avoidance and implementation of Conservation Measure 1.10 will minimize impacts to water quality and hydrologic functions.
Concrete-lined channels	Enhance water quality; retain restoration potential	Reaches of Kirker Creek	20 ft	No limitations[3]	Any activities	No limitations[4]	These reaches are located in dense urban areas and provide low habitat function for covered species. A minimal buffer width will reduce sediment and nutrient inputs from surface flows, retain some potential for stream restoration, and provide for recreational opportunities.
1st and 2nd order[5] ephemeral reaches in natural areas	Erosion and nutrient control;	Multiple unnamed tributaries to intermittent and perennial reaches	25 ft	No limitations[3]	Any activities	No limitations[4]	Although ephemeral streams play a limited role in providing habitat to covered species, these systems represent the first point of entry for sediment and other contaminants into downstream reaches. Thus, unlike the stream types below, the primary objective of the setback for ephemeral streams is to filter out sediment and contaminants before they degrade downstream habitat.

Stream Reach Type and Location[1]	Buffer Objective/ Function (from Figure 5-11)	Example Sites in Inventory Area	Required Setback (from top of bank measured in aerial perspective[2])	Limitations On Exceptions To Setback Requirements That May Be Granted By Local Agencies			Comments
				Maximum Allowable Linear Impact to Streams[3] (per project)	Activities Eligible For Streams Impact Exception	Maximum Allowable Area of Impact Within Setback[4] (per project)	
Perennial, intermittent, or 3rd or higher order[5] ephemeral streams in urban areas except Marsh Creek mainstem	Enhance water quality; retain restoration potential	Lower Willow Creek, Lower Kirker Creek	50 ft	300 feet [3]	Necessary bridges and outfalls	Up to 15% of setback area[4]	These reaches are located mostly in dense urban areas and provide low habitat function for covered species. However, potential may exist for restoration of riparian vegetation and minimal floodplain areas. In addition, a minimal buffer width will reduce sediment and nutrient inputs from surface flows and provide for recreational opportunities.
Perennial, intermittent, or 3rd or higher order[5] ephemeral streams in agricultural or natural areas and Marsh Creek mainstem	Enhance water quality; retain restoration potential	See examples below[6]	75 ft	300 feet [3]	Necessary bridges and outfalls	Up to 15% of setback area[4]	These reaches retain the greatest habitat value and potential for restoration within the Urban Development Area. The buffer will filter sediment and other contaminants, maintain habitat for covered species, allow for restoration of riparian vegetation and some small floodplain areas, as well as providing recreation opportunities.

Notes:

[1] Location parameters (e.g., “agricultural areas”, “natural areas”, etc.) describe the setting of the stream at the time of completing this HCP/NCCP and refer to the fee zones and urban landcover shown in Figure 9-1.

[2] Where native woody riparian vegetation is present, minimum setbacks must extend to the outer dripline of the riparian vegetation or the specified number of feet measured from top of bank, whichever is greatest. Riparian vegetation is defined broadly to include oaks and other woody species that function as riparian corridors. Setbacks must also meet minimum setback requirements of the applicable local land use agency. Contra Costa County has an ordinance regulating impacts near unimproved earthen channels. This Ordinance requires a “structure setback line” that varies between approximately 30 feet and 50 feet from top of bank depending on the height of top of bank above the channel invert (County Code Title 9, Division 914-14.012).

[3] Mitigation is required for all impacts to streams, as described in Chapter 5. Restoration requirements are summarized in Tables 5-16, 5-17, and 9-5. Preservation requirements are summarized in Tables 5-5a and 5-5b and may be accomplished through payment of the development fee described in Section 9.3.1 or through provision of land in lieu of fees.

[4] Restrictions will be measured as a percentage of the setback area excluding the area the of the stream channel. Impacts within setbacks must be mitigated through: a) payment of the development fee described in Section 9.3.1 over the entire property including the setback and the stream channel; and b) through payment of the riparian impact fee (see Table 9-5) for every acre of impact within the setback or through direct performance of riparian restoration at a 0.5 to 1 ratio on-site or off-site.

[5] Stream order refers to the numeric identification of the links within a stream network. This document follows the stream ordering system of Strahler (1964). In this system, a first order stream is a stream with an identifiable bed and bank, without any tributary streams. A second order stream is formed by the confluence of two first order streams. A third order stream is formed by the confluence of two second order streams, and so on. Addition of a lesser order stream does not change the stream order of the trunk stream.

[6] Perennial streams in agricultural or natural areas within the Inventory Area consist of the following:

- Mount Diablo Creek, Russelman Creek, Peacock Creek upstream of the Oakhurst Country Club property, and tributaries to Mount Diablo Creek within Mount Diablo State Park;
- Kellogg Creek in the Foothills/Upper Valley and Delta geomorphic zones;
- Brushy Creek in the Delta and Lower Valley/Plain geomorphic zones;
- Indian, Rock, Sand Mound, Dutch, Piper, and Taylor Sloughs, and False River (does not include reaches in concrete channels); and
- Sand Creek and Oil Canyon Creek in the Montane geomorphic zone.

Table 6-3. Recommended Setbacks to Preserve Riparian and Stream Function (from studies throughout the United States)

	Function	Citation	Recommended Setback
Physical Properties	**Sediment and Nutrient Reduction**	Corley et. al. 1999	>33 ft
		Nichols et. al. 1998	>60 ft
		Woodward and Rock 1995	>50 ft
		Desbonnet et. al. 1994	80 ft
		Peterson et. al. 1992	>33 ft
		Castelle et. al. 1992	>50 ft
		Schellinger and Clausen 1992	75 ft
		Welsch 1991	>85 ft
		Dillaha et. al. 1989	>30 ft
		Gilliam and Skaggs 1988	290 ft- 50% sediment deposition
		Budd et. al. 1987	50 ft
		Jacobs and Gilliam 1985	50 ft
		Lynch et. al. 1985	98 ft
		Erman et. al. 1983	98 ft
		Lowrance 1984	60-120 ft
		Moring 1982	98 ft
		Young et. al. 1980	80 ft
		Erman et. al. 1977	98 ft
		Karr and Scholosser 1977	75% removal 98-125 ft
		Broderson 1973	50-200 ft (one tree height)
		Wilson 1967	49 ft (silt), and 400 ft (clay)
	Removal of Fecal Coliform	Johnson and Ryba 1992*	75-300 ft
	Moderation of Stream Temperature/Microclimate	Lynch and Corbett 1990	100 ft
		Jones et. al. 1988	100-140 ft
		Lynch et. al. 1985	98 ft
		Steinblums et. al. 1984	75-125 ft for 60-80% shade
		Hewlet and Fortson 1982	50-100 ft
	Channel Complexity	Marcus 2002	4X bankfull width
		Brosofske et. al. 1997	>145 ft
		Chapel et. al. 1992	135-220 ft
		Lynch et. al. 1985	65-100 ft

	Function	Citation	Recommended Setback
Biological Properties	**Salmonid Habitat**	Ligon et. al. 1999	>150 ft
		USFS/BLM 1994	300 ft
		Welsch 1991	>85ft
	Reptile/Amphibian Habitat	Burbink et. al. 1998	>325 ft
		Semlitsch 1998	540 ft
		Buhlmann 1998	440 ft
		Rudolph and Dickson 1990	98 ft
	Bird Habitat/Diversity	Miller et al 2003	Width of historic floodplain
		RHJV 2000	250 ft
		Whitaker and Montevechi 1999	>160 ft
		Hagar 1999	>130 ft
		Kilgo et. al. 1998	>1600 ft
		Richardson and Miller 1997	>160
		Mitchell 1996	>325 ft
		Hodges and Krementz 1996	>325 ft
		Spackman and Hughes 1995	450 ft for 90% of species diversity
	Mammal Habitat/Diversity	Hilty in press (Conservation Biology)	>1000 ft
		Dickson 1989	> 160 ft
	Plant Diversity	Spackman and Hughes 1995	30-100 ft for 90% of species
	General Riparian/Ecosystem Function	Levey et. al. 2002	>80 ft
		NH FSSWT 2000	100 ft, 300 ft, 600 ft by stream order
		Spence et. al. 1996	98-145 ft
		Johnson and Ryba 1992*	> 98 ft
		Chapel et. al. 1992	160-650 ft
		Welsch 1991	>85ft
	*article does not present new data, but instead is a review of existing data		

Table 6-4. Regulatory Guidance on Stream Setbacks

Local Ordinances in Northern California	Stream Setback
Sonoma County	upland/urban = 50 ft Russian River = 200 ft flatland/valleys = 100 ft
Marin County	coastal/rural = 100 ft urban = 50 ft
Humbolt County	100 ft perennial streams 50 ft intermittent streams
Santa Cruz County	50 ft no development zone on perennial streams 30 ft no development zone on intermittent streams
Contra Costa County	Development near Natural Creeks and Streams new urban development = 50 ft buildings = 30–50 ft (depending on site specific calculations) intensification of cattle grazing = 100 ft (as part of discretionary use permit)
Santa Clara County (proposed)	150 ft on all streams draining watersheds ≥ 1mi^2 (320 acres), unclear on smaller drainages
Solano County HCP (proposed)	Lead agency is proposing a minimum 100 ft setback from top of bank or edge of existing riparian vegetation, whichever is greater on all 3rd order or higher streams
City of Palo Alto	100 ft buffer zone for any development other than single family residential
City of Santa Cruz	all watercourses = 100 ft
Selected Setback Ordinances in Effect elsewhere in the U.S.	
Clackamas County, Oregon	Principal River 100–150 ft from MHW Large Streams - 100 ft from MHW Medium Stream - 70 ft from MHW Small Stream - 50 ft from MHW
Cobb County, Georgia	50–200 ft depending on the size of the watershed
Lane County, Oregon	Large Streams w/ T&E species = 150 ft Other streams with T&E species = 125 ft Fish-bearing streams w/o T&E = 50–100 ft

Local Ordinances in Northern California	Stream Setback
Lexana County, Kansas	Sensitive Streams: Stream order 1 = 150 ft Stream order 2 = 250 ft Stream order 3 = 300 ft Restorable Streams: Stream order 1 = 125 ft Stream order 2 = 200 ft Stream order 3 = 250 ft
Kings County, Washington	Impacted Streams: Stream order 1 = 100 ft Stream order 2 = 150 ft Stream order 3 = 200 ft 115 ft - if property is inside urban growth area
Summit County, Ohio	Watershed >300 sq.mi. =300 ft Watershed >20 sq. mi. = 100 ft Watershed <.5 sq. mi.=30–75 ft
Suwanne River, Florida	75–250 ft depending on soil type
Generic Setbacks	
EPA Ideal	100 ft minimum + slope variable 15–17%= +10 ft 18–20%= +30 ft 21–23%= +50 ft 24–25%= +60 ft
USFS, Northeastern Area Recommendations (Welsh 1991)	95 ft min (zone 1=15 ft; zone 2 min = 60; zone 3 min = 20 ft)
Storm Water Center	100 ft to 150 ft min (zone 1 = 25 ft min, zone 2 = 50 ft to 100 ft, zone 3 = 25 ft min)
Kondolf et. al. 1996	2 zones: inner zone is fixed, but based on veg. community type and energy; outer zone variable, but based on proximity to stream, hillside steepness, soil erodibility
NRCS	General purpose buffer – min. 15 ft from top of bank or normal water line To reduce excess amounts of sediment, organic matter, nutrients, pesticides – 2 zones: min 100 ft or 30% of the geomorphic flood plain whichever is less, but not less than 35 ft
Oregon Forest Practices Act - Commercial Timber Harvesting on Private Forest Land	100 ft from fish bearing streams

Table 6-5. No-Take Species (Extremely Rare Plants and Fully Protected Species)

Common Name *Scientific Name*	Status[1] State	 Federal	Rationale
Plants			
Large-flowered fiddleneck *Amsinckia grandiflora*	SE	FE	No natural populations occur in the inventory area; if one were discovered, it would be highly significant and should be preserved.
Alkali milkvetch *Astragalus tener* ssp. *tener*	1B	–	Thought to be extirpated from Contra Costa County; suitable habitat may be present in the inventory area; if any populations are found, they would have to be preserved.
Mount Diablo buckwheat *Eriogonum truncatum*	1A	–	Presumed extinct (USFWS 2002) but rediscovered in May 2005 in Mount Diablo State Park; if any populations were discovered in the inventory area, they would have to preserved.
Diamond-petaled poppy *Eschscholzia rhombipetala*	1B	–	Known from only two populations in the world; not seen in the inventory area since 1889. Any populations found in the inventory area would be highly significant.
Contra Costa goldfields *Lasthenia conjugens*	1B	FE	All known populations in inventory area have been extirpated; if new populations were discovered, they would have to be preserved. Critical habitat designated near Byron Airport (USFWS 2003).
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	1A	–	Presumed extinct; historic occurrences in the inventory area; if discovered, population would have to be preserved.
Birds			
White-tailed Kite *Elanus leucurus*	FP	–	No direct take of individuals is allowed because species is designated as fully protected under the Fish and Game Code.
Peregrine Falcon *Falco peregrinus*	FP	–	No direct take of individuals is allowed because species is designated as fully protected under the Fish and Game Code.
Golden Eagle *Aquila chrysaetos*	FP	BGPA	No direct take of individuals is allowed because species is designated as fully protected under the Fish and Game Code.
Mammals			
Ringtail *Bassariscus astutus*	FP		No direct take of individuals is allowed because species is designated as fully protected under the Fish and Game Code.

[1]**Status:**

Federal

FE Federally Listed as Endangered
FT Federally Listed as Threatened
FSC Federal Species of Concern
BGPA Bald Eagle and Golden Eagle Protection Act

State

SE State Listed as Endangered
ST State Listed as Threatened
CSC California Special Concern Species
SR State Rare (plants)
FP Fully Protected

California Native Plant Society

1A Presumed Extinct
1B Rare or Endangered in California and Elsewhere

Table 6-6. Conditions on Rural Road Projects Covered by the HCP/NCCP

	Natural Lands Projects									Ag. Area Projects									Small Projects		
Road Conservation Measure	Balfour Road Widening*	Buchannan Bypass	Kirker Pass Widening	Marsh Creek Rd Realignment	San Marco Road Extension	Vasco-Byron Hwy Connector (North of Byron Hot Springs)	Vasco-Byron Hwy Connector (South of Byron Hot Springs)	Vasco Road Widening	Other Road Safety Improvements Subject to Design	Bethel Island/Cypress Road Widening	Byron Hwy Northern Extension	Byron Highway Widening	EBART	Highway 239 (Proposed)	Marsh Creek Road/Walnut Blvd. Widening	SR4 Widening to Disco Bay	Sand Creek Rd./Sycamore Ave. Extension	Other Road Safety Improvements Subject to Design	Bridge Repair, Retrofit, Replace	Road Safety Improvements	Bicycle Trails
Siting Requirements																					
Site in least sensitive locations	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	N/A	N/A	R
Site equipment storage away from sensitive areas	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Conduct project surveys well in advance of design	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Planning survey requirements apply to r-o-way	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Widlife Design Requirements																					
Design requirements superceded by latest research	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Collect data on wildlife movement for at least 1 yr prior to design	O	R	O	R	R	R	R	R	O	N/A	N/A	R	N/A	R	N/A	N/A	N/A	O	N/A	N/A	N/A
Use bridges, viaducts, or causeways	N/A	O	N/A	P	O	P	R	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Construct road undercrossings at freq. Intervals	O	P	O	P	P	P	R	R	O	N/A	N/A	O	N/A	P	N/A	N/A	N/A	O	N/A	N/A	N/A
Install crossing facilities at known travel routes	O	P	O	P	P	P	R	R	O	N/A	N/A	O	N/A	P	N/A	N/A	N/A	O	N/A	N/A	N/A
Large wildlife crossings every mile or less	O	P	O	P	P	P	R	R	O	N/A	N/A	O	N/A	P	N/A	N/A	N/A	O	N/A	N/A	N/A
Small wildlife crossings every 1,000 feet or less	O	P	O	P	P	P	R	R	O	N/A	N/A	O	N/A	P	N/A	N/A	N/A	O	N/A	N/A	N/A
Minimum sizing for culverts	O	P	O	P	P	P	R	R	O	N/A	N/A	O	N/A	P	N/A	N/A	N/A	O	N/A	N/A	N/A
Use grating over tunnels/culverts for light penetration	O	P	O	P	P	P	R	R	O	N/A	N/A	O	N/A	P	N/A	N/A	N/A	O	N/A	N/A	N/A
Fencing designs to maximize crossing use	O	P	O	P	P	P	R	R	O	N/A	N/A	O	N/A	P	N/A	N/A	N/A	O	N/A	N/A	N/A
Discourage trails within 500 feet	O	P	O	P	P	P	R	R	O	N/A	N/A	O	N/A	P	N/A	N/A	N/A	O	N/A	N/A	N/A
Road median designs for wildlife	O	P	O	P	P	P	R	R	R	N/A	N/A	R	N/A	R	O	O	N/A	R	N/A	O	N/A
Construction Actions																					
Best management practices	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Install monitoring boxes (cameras)	O	P	O	P	P	P	R	R	O	N/A	N/A	P	N/A	P	N/A	N/A	N/A	O	N/A	N/A	N/A
Post-Construction Actions																					
Control roadside vegetation adj to preserves and OS	R	R	R	R	R	R	R	R	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	R	N/A	N/A	N/A
Revegetate cut/fill slopes with natives	R	R	R	R	R	R	R	R	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	R	R	R	R
Monitor structures for wildlife use	O	P	O	P	P	P	R	R	O	N/A	N/A	P	N/A	P	N/A	N/A	N/A	O	N/A	N/A	N/A

Key

R = Required

P = Possible (required unless data demonstrate measure would not benefit wildlife and CDFG and USFWS agree to omit)

O = Optional (measure can be implemented at agency's discretion; if implemented, it will reduce mitigation fee; fee reduction determined case-by-case by Implementing Entity)

N/A = Not applicable or not needed

*Requirements apply only if Balfour Road is built under the Initial Urban Development Area