

HCPA East Contra Costa County Habitat Conservation Plan Association

HCPA Coordination Group Meeting

Thursday, March 17, 2005

1 p.m. to 3 p.m.

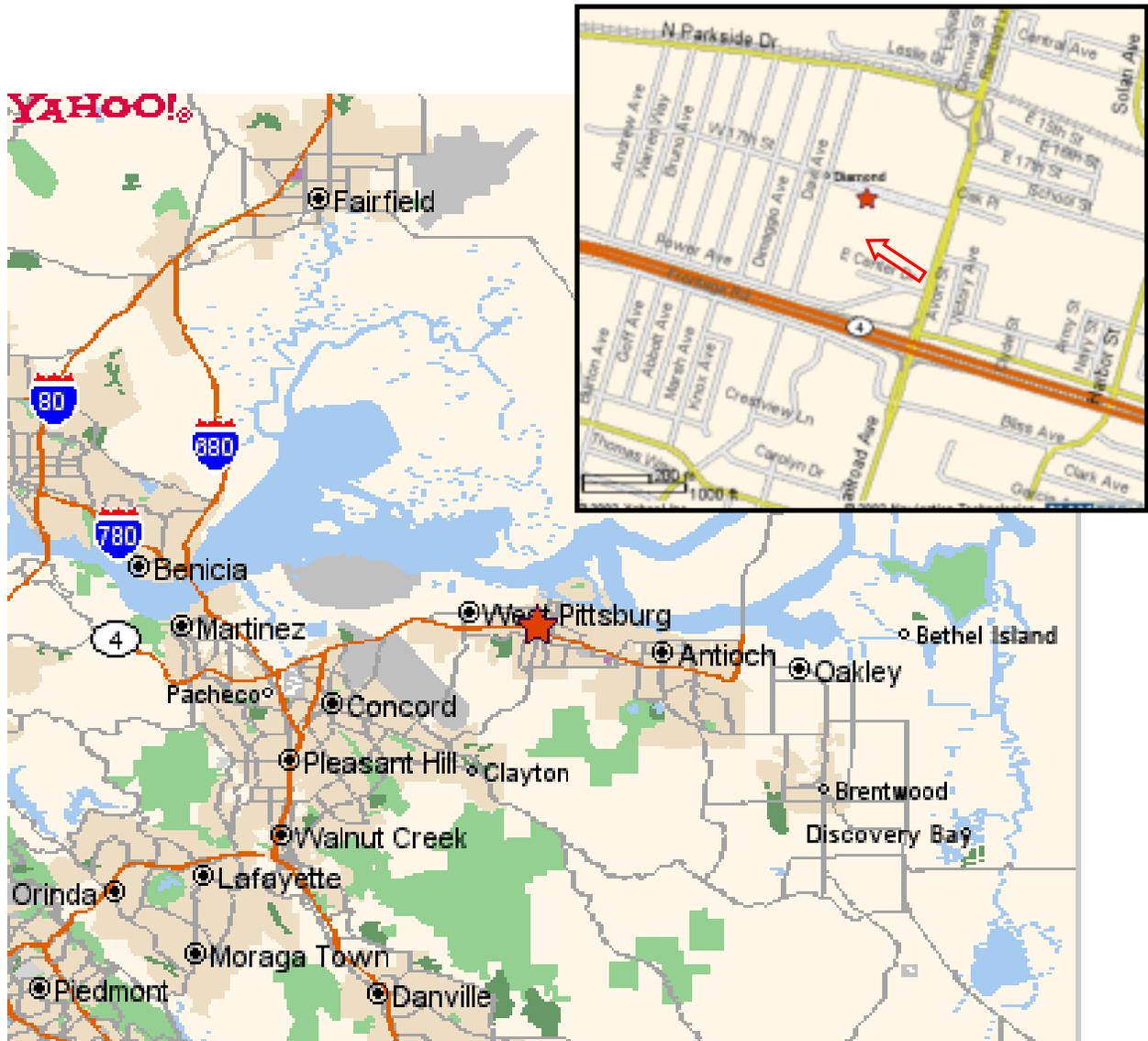
City of Pittsburg Council Chambers
65 Civic Drive in Pittsburg, 3rd Floor
(see map on reverse)

Agenda

- 1:00 Introductions. Review contents of meeting packet. Review and approve Draft Meeting Record of the January 20, 2005 Coordination Group meeting.
- 1:10 Updates:
- General update on status of planning effort, including wetlands (packet includes 2-23-05 memo to EGC with a general update)
 - Anticipated timeline for completion of Public Draft HCP
- 1:30 Discussion on latest version of revised biological goals and objectives (attached)
- 2:00 Discussion on wetlands permitting, including:
- General update on agency involvement and on our proposed approach to coordinating wetlands permitting with the HCP/NCCP;
 - Key elements of wetlands permitting (see attached table which also references tables and sections from the HCP (also attached))
 - Past and new comments from Coordination Group
- 2:50 Confirm upcoming meeting dates. Upcoming Coordination Group meetings are scheduled as follows for the City of Pittsburg Council Chambers (usually 3rd Thursdays):
Thursday, April 21, 1 p.m. to 3 p.m.
Thursday May 19, 1 p.m. to 3 p.m.
HCPA Executive Governing Committee: May 19, 2005, 5:30 pm
- 2:55 Public comment.
- 3:00 Adjourn.

Times are approximate. If you have questions about this agenda or desire additional meeting materials, you may contact Abby Fateman of the Contra Costa County Community Development Department at 925-335-1272. The HCPA will provide reasonable accommodation for persons with disabilities planning to participate in this meeting who contact staff at least 72 hours before the meeting.

Map and Directions to Pittsburg City Hall 65 Civic Drive



Directions from I-680, Central County

- 1) Take Hwy 4 East toward Antioch/Stockton
- 2) Follow Hwy East over the hill (Willow Pass)
- 3) Exit Railroad Ave. (the 2nd exit after the hill)
- 4) At the end of the exit ramp, turn left on Railroad Ave.
- 5) Turn left at the second intersection, East Center Drive (signs for various city offices will also point you this way)
- 6) Immediately bear right into the large parking lot next to City Hall
- 7) Meeting is on the 3rd floor

Directions from Antioch and points east

- 1) Take Hwy 4 West toward Martinez/Richmond
- 2) Exit Railroad Ave.
- 3) At the end of the exit ramp, turn right on Railroad Ave.
- 4) Turn left at the next intersection, East Center Drive (signs for various city offices will also point you this way)
- 5) Immediately bear right into the large parking lot next to City Hall
- 6) Meeting is on the 3rd floor

**EAST CONTRA COSTA COUNTY
HABITAT CONSERVATION PLAN ASSOCIATION (HCPA)
EXECUTIVE GOVERNING COMMITTEE**

DATE: September 29, 2004
TO: Executive Governing Committee (EGC)
FROM: Member Agency Staff
SUBJECT: Updates, status reports, and release of Draft HCP/NCCP

RECOMMENDATION

- 1) ACCEPT status report on the project and AUTHORIZE staff to release the Draft HCP/NCCP and related documents for public review, should this be possible before the next EGC meeting.

FISCAL IMPACTS

None.

DISCUSSION

a) General update: HCPA committees, staff, and consultants are working intensively to prepare for the next major HCPA milestone, the release of the formal Draft HCP / NCCP, the Draft EIR / EIS, the Draft Implementation Agreement and other related documents. Mid April is now the target for completing these documents. Staff and consultants have recompiled and updated all elements of the HCP into one organized package for concurrent review by all departments of the wildlife agencies (including attorneys and environmental compliance specialists) to create a publishable Draft.

Staff will provide a powerpoint presentation to update the EGC on the planning effort.

- **Work of consultants and products:** Jones and Stokes will provide a powerpoint presentation
- **Wetlands:** The HCPA has consistently sought to include wetlands permitting in the conservation plan, a difficult goal that has not yet been achieved by any other HCP that we are aware of (though all the Northern California HCPs are seeking the same thing). The history of our efforts has been more fully recorded in past reports and is not worth dredging up here. Suffice it to say that we now feel that all wetlands agencies, including the Army Corps (who have been supportive and engaged the longest) and the Regional Water Quality Control Boards are interested in our effort and are willing to work with us to develop regional permitting programs. If you care to know more detail, provided below is a status report recently provided by email to wetland agencies:

Coordinating wetlands permitting and the HCP: a status summary and proposed workplan for the next months (originally presented by email to wetlands agencies; repeated here for EGC review)

We are making good progress on the East Contra Costa regional conservation plan and it is time to define key provisions related to wetlands permitting and conservation. In a nutshell, here's where we are:

a) The HCP/NCCP is coming together nicely and we hope to have an NOA in the Federal Register and a formal public draft HCP as early as mid April.

b) The 404 Regional Simplified Permit Program (SPP) has been through a couple of iterations and an Aquatic resources Inventory has been developed. Both documents were crafted in close consultation with the USACE and USEPA. The Draft SPP and Inventory have been presented to our stakeholders and some feedback has been received. Both items were couched as documents prepared in consultation with USACE and USEPA but still fundamentally as draft proposals formulated by local government agencies. We propose to include both the Inventory and a Draft RPP proposal as appendices in the HCP/NCCP. To review, the SPP is essentially a modified Nationwide Permit Program. We understand it would supplant the Nationwide Program in our HCP area and contain locally tailored avoidance, minimization and mitigation measures that parallel the HCP/NCCP. We understand the Corps would seek to perform its own NEPA, relying on the HCP EIS but not exclusively.

c) Regarding 401 Cert and WDRs, significant outreach has occurred with the Regional Boards. Region 2 (SF) has expressed interest in helping to shape a 401/WDR program that is coordinated with the HCP. Region 2 may be able to take a lead role in working out the details, though additional discussion is needed with both Boards on that and on the role of the SWRCB. I think the 401/WDR permit program could look a lot like the 404 SPP. We have started to discuss a permit program outline with the SF Regional Board. We understand from our meetings that we may need to offer some assurances that resources in one Region won't be completely sacrificed for the benefit of resources in another Region, but also that this doesn't mean there must be a brick wall through the inventory area either. The SF Regional Board would like to rely on the EIR prepared by the local agencies for CEQA.

d) 1602, Streambed Alteration. Fish and Game, as key participant since the very beginning, is working with us to outline a streambed alteration agreement program that, like the 404 SPP and 401/WDR program, would require the applicant to get permit coverage directly from CDFG, but would rely on the provisions of the HCP/NCCP for avoidance, minimization, and mitigation. CEQA would be under the HCP EIR.

Here's what I see as the key remaining tasks, at least in the next few months:

e) We need to define the key provisions and limitations of wetlands permitting and conservation. For instance, what should the caps be per project and cumulatively on wetlands fill? What should the mitigation ratio be? What stream set backs will be required? Proposed answers to many of these questions have been formulated in an HCP context and will be provisions of the Draft HCP.

We would like to seek the input of all the affected agencies--wildlife and wetlands--on these key provisions now so that this input can be captured in the Draft HCP.

f) We need to start crafting an agreement between the wetlands agencies and the local agencies regarding implementation of the mitigation aspects of the regional wetlands permit programs. Developers would receive permits directly from the wetlands agencies and the wetlands agencies would ensure that avoidance and minimization conforms to the wetland program rules. But mitigation would occur through the local agencies and we expect the wetlands agencies will want to memorialize and assure the timely and effective performance of mitigation through an MOU of some sort with the local agencies. We propose a joint MOU that includes the wetlands agencies and the local JPA that will implement land acquisition, restoration, etc.

- **EIR / EIS:** A separate team within Jones and Stokes is working to complete a Draft EIR / EIS. The HCPA will be the lead agency under CEQA. The USFWS will be the lead agency under NEPA. Review of the preliminary draft EIS is taking longer than expected. The next EGC meeting could also serve as a CEQA hearing.
- **Implementation Agreement:** Resources Law Group is taking the lead in drafting an Implementation Agreement and has created several iterations for review by staff. A Draft Implementation Agreement will be part of the package of draft documents staff hopes to release in April.
- **Implementing Ordinance:** Resources Law Group is taking the lead in drafting a template Implementing Ordinance. A Draft template Implementing Ordinance will be part of the package of draft documents staff hopes to release in April. Land use planning agencies receiving permits under the HCP/NCCP will ultimately be required to adopt Implementing Ordinances to impose the HCP/NCCP fees and other measures.
- **Budget update:** see agenda item #6
- **Schedule update:** As summarized above, HCPA committees, staff, and consultants are working intensively to prepare for the next major HCPA milestone, the release of the formal Draft HCP / NCCP, the Draft EIR / EIS, the Draft Implementation Agreement and other related documents. Mid April is now the target for completing these documents.

b) Update on the Public Outreach and Involvement Program:

- **Web site:** <http://www.cocohcp.org>, is continuously updated to reflect meeting records, future scheduled meetings and agendas for all HCPA committees. The documents section of the website continues to include all major draft documents released to date, including the Working Draft HCP/NCCP. Maps that are part of then Working Draft HCP/NCCP are also available online.
- **HCPA Coordination Group:** The CG has met four times since the last EGC meeting in June and the CG Funding Subcommittee has also met three times. The CG agendas, and meeting records are available on the HCPA website.
- **Additional meetings attended and outreach performed:** Since the last EGC meeting, presentations have been made to the Brentwood City Council (January 25), to the 6 county “Northern California Conservation Planning Partners” (we are a member of this group) Annual Conference (November 16), to the Continuing Legal Education Annual Endangered Species Conference (December 3), to the Dutch Slough restoration Committee (December 9), and to Bay Area Conservation Biology Symposium at Stanford (January

22). Numerous individual meetings have also been held with individual development, conservation, and landowner interests to discuss the HCP.

- **Plans for other public meetings and workshops:** Staff continues to be open to making presentations to public groups. A new round of update reports to the HCPA land use planning agencies should begin in a few months once the Draft HCP is released.

Staff has arranged a briefing on the East Contra Costa County HCP/NCCP with Ryan Brodrick (Director of the California Department of Fish and Game) and Steve Thompson (Regional Manager, California-Nevada Field Operations Office, US Fish and Wildlife Service) for February 25 at 10 am in Sacramento. Delegates from the EGC are most welcome.

The partnership of six regional conservation planning efforts in Northern California with whom we have been cooperating for the past several years to pursue funding requests from Congress will hold another conference this year similar to the one held last year. This year the conference will be held November in Vacaville. EGC members will receive an invitation.

c) State and Federal Resource Agencies' perspectives: Agency representatives may be present and may wish to comment on the direction of the planning effort.

d) Consider authorizing staff to work with the Coordination Group to resolve any outstanding issues and to prepare and release a Draft HCP/NCCP that incorporates policy direction provided by the EGC under this item and provided at the September 29, 2004 meeting: Staff seeks this direction in case the HCP is ready before the EGC meets again, to keep the project moving as quickly and efficiently as possible. Staff believes that the policy guidance previously provided by the EGC has been incorporated in the draft documents.

A copy of the background materials for agenda item #6 from the September 29, 2004 packet is enclosed (bound separately). That item provided an overview of funding and key outstanding issues identified by stakeholders. Following this page please find those funding tables that have been updated. At the February 23 meeting, staff will review progress toward addressing the key outstanding issues identified by stakeholders.

Table 5.1. Biological Goals and Objectives and the Conservation Measures That Support Them

Biological Goals and Objectives	Conservation Measures that Support Objectives
Grassland	
<p>San Joaquin kit fox</p> <p>Townsend’s big-eared bat</p> <p>Western burrowing owl</p> <p>Swainson’s hawk [Streams and Riparian woodland/scrub]*</p> <p>Tricolored blackbird [Wetlands]</p> <p>Golden eagle</p> <p>Silvery legless lizard</p> <p>Alameda whipsnake [Chaparral/scrub]</p> <p>*Habitats shown in brackets are the habitats with which the species are associated; the specific BGOs pertaining to these species are addressed in the discussion of the bracketed habitats. For example, although Swainson’s hawk uses grassland habitat, its primary association (in this case, nesting habitat) is with streams and riparian woodland/scrub, and the BGOs specific to Swainson’s hawk are addressed in that section of the table.</p>	<p>Western pond turtle [Wetlands]</p> <p>California tiger salamander [Wetlands]</p> <p>California red-legged frog [Wetlands]</p> <p>Big tarplant</p> <p>San Joaquin spearscale</p> <p>Brittlescale</p> <p>Recurved larkspur</p> <p>Round-leaved filaree</p>
<p>Goal 1: Preserve sufficient habitat in the inventory area to maintain viable populations of grassland-dependent covered species</p> <p>Objective 1.1. Preserve 13,000 acres of annual grassland and 900 acres of alkali grassland</p> <p>Objective 1.2. Protect native grassland alliances within the Preserve System</p>	
<p>Goal 2: Enhance grassland to promote native biological diversity and habitat heterogeneity</p> <p>Objective 2.1. Increase the relative cover of native grasses and forbs in native grassland vegetation alliances and other grassland types</p> <p>Objective 2.2. Increase structural diversity by creating and maintaining a mosaic of grassland types and conditions</p> <p>Objective 2.3. Reduce the biomass, cover, and extent of exotic plants (i.e., non-native invasive plants) in the Preserve System</p>	
<p>Goal 3: Increase availability of burrows within grassland for San Joaquin kit fox, California tiger salamander, California red-legged frog, and western burrowing owl</p> <p>Objective 3.1. Increase the number and distribution of California ground squirrel burrows</p>	
	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p>
	<p>Conservation Measure 1.2. Prepare and Implement an Exotic Plant Control Program for the Preserve System</p> <p>Conservation Measure 2.4. Grassland Management</p>
	<p>Conservation Measure 2.5. Natural Burrow Availability and Prey Base for Covered Species in Grasslands</p>

Biological Goals and Objectives	Conservation Measures that Support Objectives
<p>Goal 4: Preserve the most important movement route and core habitat for San Joaquin kit fox</p> <p>Objective 4.1. Preserve 3,200 acres in Horse, Lone Tree, and Deer Valleys (Subzones 2e, 2f, 2g, and 2h) to protect the two most important movement routes for San Joaquin kit fox between Black Diamond Mines Regional Preserve and Cowell Ranch State Park</p> <p>Objective 4.2. Preserve an important movement route for San Joaquin kit fox between Alameda County and Contra Costa County by protecting habitat in Zone 5 between the County line, the Byron Airport Habitat Mitigation Lands, and the Los Vaqueros Watershed</p> <p>Objective 4.1. Preserve 4,300 acres of annual grassland and 750 acres of alkali grassland in Subzones 5a and 5d as suitable core habitat</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p>
<p>Goal 5: Maintain or increase population size and distribution of Townsend’s western big-eared bat in the Preserve System</p> <p>Objective 5.1. Preserve hibernacula or maternity roosts of Townsend’s western big-eared bat</p> <p>Objective 5.2. Enhance roosting habitat by protecting any abandoned mine, cave, or building in the Preserve System and, if feasible, creating artificial hibernacula</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p> <p>Conservation Measure 1.5. Prepare and Implement a Recreation Plan</p> <p>Conservation Measure 3.1. Protect and Enhance Roosting Habitat for Townsend’s Western Big-Eared Bat.</p>
<p>Goal 6: Maintain or increase population size and distribution of golden eagles in the inventory area</p> <p>Objective 6.1. Acquire land in the Preserve System that includes occupied nests and suitable nest sites</p> <p>Objective 6.2. When feasible, retire wind turbine leases within the Preserve System</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p> <p>Conservation Measure 3.3. Protect Golden Eagle Nest Sites within Preserve System</p>
<p>Goal 7: Increase population and distribution of western burrowing owl</p> <p>Objective 7.1. Install artificial burrows and perches, where appropriate [Janice and Brenda will refine]</p>	<p>Conservation Measure 3.5. Establish Artificial Perches</p>

Biological Goals and Objectives	Conservation Measures that Support Objectives
<p>Goal 8: Protect in the Preserve System 11 of the 19 known unprotected occurrences of grassland-dependent covered plants</p> <p>Objective 8.1. Protect populations of covered plants that are at least as large and as healthy (as defined by physical condition, age structure, reproductive success, diversity and availability of suitable habitat, long-term observation of population) as populations lost to covered activities [may move to “meta-objective”]</p> <p>Objective 8.2 Protect two of the five known occurrences of brittlescale outside public lands</p> <p>Objective 8.3. Protect five of the six known occurrences of big tarplant outside public lands</p> <p>Objective 8.4. Protect two of the three known occurrences of recurved larkspur outside public lands</p> <p>Objective 8.5. Protect two of the five known occurrences of round-leaved filaree outside public lands</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p>
<p>Goal 9: Enhance populations of grassland-dependent covered plants</p> <p>Objective 9.1. Where feasible and biologically desirable, increase population size and distribution of grassland-dependent covered plants</p>	<p>Conservation Measure 3.9. Conduct Experimental Management to Enhance Covered Plant Populations</p>
<p>Oak Woodland</p> <p>San Joaquin kit fox [Grassland]</p> <p>Golden eagle [Grassland]</p> <p>Slivery legless lizard [Grassland]</p> <p>California red-legged frog [Wetlands]</p> <p>California tiger salamander [Wetlands]</p>	<p>Western pond turtle [Wetlands]</p> <p>Mt. Diabale fairy lantern [Chaparral/scrub]</p> <p>Diablo helianthella [Chaparral/scrub]</p> <p>Brewer’s dwarf flax [Chaparral/scrub]</p> <p>Showy madia</p>
<p>Goal 10: Preserve oak woodland and oak savanna in the inventory area.</p> <p>Objective 1.1. Protect 900 acres of oak woodland and oak savanna</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p>
<p>Goal 11: Maintain the current canopy coverage of oaks and other overstory trees within oak woodland and oak savanna land-cover types</p> <p>Objective 11.1. Ensure tree recruitment and age structure are adequate to replace lost trees and maintain canopy coverage</p> <p>Objective 11.2.. Reduce competition between tree seedlings and other plants to enhance survival rates of tree seedlings and saplings</p>	<p>Conservation Measure 2.6. Oak Woodland and Oak Savanna Management</p>
<p>Goal 12: Enhance oak woodland and oak savanna to promote biological diversity and habitat heterogeneity</p> <p>Objective 12.1. Increase the proportion of native species in oak woodland and oak savanna understories</p> <p>Objective 12.2. Leave in place snags, dead trees, and downed wood</p>	<p>Conservation Measure 2.6. Oak Woodland and Oak Savanna Management</p>

Biological Goals and Objectives	Conservation Measures that Support Objectives
<p>Goal 13: Restore oak savanna to compensate for its loss from covered activities</p> <p>Objective 13.1. Replace oak savanna vegetation alliances (in kind) that are lost to covered activities at a ratio of 1:1</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p> <p>Conservation Measure 2.7. Compensate for loss of Oak Savanna</p>
<p>Goal 14: Protect populations of showy madia within oak woodland</p> <p>Objective 14.1. Identify and maintain populations of showy madia in the inventory area</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p> <p>Conservation Measure 3.9. Conduct Experimental Management to Enhance Covered Plant Populations</p>
<p>Chaparral/Scrub</p> <p>Alameda whipsnake</p> <p>Mount Diablo manzanita</p> <p>Mount Diablo fairy lantern</p>	<p>Diablo helianthella</p> <p>Brewer’s dwarf flax</p>
<p>Goal 15: Preserve chaparral/scrub in the inventory area</p> <p>Objective 15.1. Protect 550 acres of chaparral/scrub that supports a diversity of native plant alliances including chaparral, California sage scrub, and black sage scrub</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p>
<p>Goal 16: Enhance chaparral to promote native biological diversity and habitat heterogeneity</p> <p>Objective 16.1. Maintain or mimic the natural fire regime</p> <p>Objective 16.2. Maintain a mosaic of stand ages and species composition across the landscape</p> <p>Objective 16.3. Promote canopy gaps within chaparral/scrub patches</p>	<p>Conservation Measure 2.8. Chaparral/Scrub Management</p>
<p>Goal 17: Contribute substantially to the recovery of Alameda whipsnake by protecting and enhancing chaparral/scrub.</p> <p>Objective 17.1. Preserve 70% of currently unprotected core and perimeter habitat in Subzones 2a, 2b, 2c, 3a, and Zone 4</p> <p>Objective 17.2. Preserve movement habitat between patches of core habitat, including the linkage in Zone 2 and Subzone 3a between Black Diamond Mines Regional Preserve and Mount Diablo State Park</p> <p>Objective 17.3. Maintain diverse canopy-coverage stages</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p> <p>Conservation Measure 2.8. Chaparral/Scrub Management</p>

Biological Goals and Objectives	Conservation Measures that Support Objectives
<p>Goal 18: Protect in the Preserve System all known unprotected occurrences of chaparral-dependent covered plants</p> <p>Objective 18.1 Protect populations of covered plants that are at least as large and as healthy (as defined by physical condition, age structure, reproductive success, diversity and availability of suitable habitat, long-term observation of population) as populations lost to covered activities [may move to “meta-objective”]</p> <p>Objective 18.2. Protect the two known occurrences of Mt. Diablo manzanita outside public lands</p> <p>Objective 18.3. Protect the two known occurrences of Diablo helianthella outside public lands</p> <p>Objective 18.4. Protect the three known occurrences of Brewer’s dwarf flax outside public lands</p> <p>Objective 18.5 Protect the one known occurrence of Mount Diablo fairy lantern outside public lands</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p>
<p>Streams and Riparian Woodland/Scrub</p> <p>Swainson’s hawk</p> <p>Foothill yellow-legged frog</p>	<p>Western pond turtle [Wetlands]</p> <p>California red-legged frog [Wetlands]</p>
<p>Goal 19: Preserve streams and riparian woodland /scrub in the inventory area</p> <p>Objective 1.1. Protect a minimum of 5 miles of stream</p> <p>Objective 1.2. Acquire riparian/scrub at a ratio of 2:1 (estimated to be 70 acres for maximum urban development area) and protect as part of the Preserve System</p>	<p>Conservation Measure 1.1. Acquire Lands for Preserve System</p>
<p>Goal 20: Enhance riparian woodland/scrub to promote native biological diversity and habitat heterogeneity</p> <p>Objective 20.1. Maintain or increase the cover, width, and connectivity of existing riparian vegetation consistent with current stream and habitat function</p> <p>Objective 20.2. Reduce the biomass, cover, and extent of exotic (i.e., non-native invasive) plants in the Preserve System</p>	<p>Conservation Measure 1.2. Prepare and Implement an Exotic Plant Control Program for the Preserve System</p> <p>Conservation Measure 2.9. Streams and Riparian Woodland/Scrub Management</p> <p>Conservation Measure 2.10. Compensate for Loss of Streams and Riparian Woodland/Scrub</p>

Biological Goals and Objectives	Conservation Measures that Support Objectives
Goal 21: Maintain and enhance instream aquatic habitat for covered species and native fish	
Objective 21.1. Promote the natural disturbance regime (e.g., flooding, sediment deposition and scour)	Conservation Measure 2.9. Streams and Riparian Woodland/Scrub Management
Objective 21.2. Reduce water temperature and temperature variation	Conservation Measure 2.10. Compensate for Loss of Streams and Riparian Woodland/Scrub
Objective 21.3. Increase inputs of organic matter	
Objective 21.4. Where appropriate, reduce sediment input and downstream sediment transport and deposition	
Objective 21.5. Maintain and, where appropriate, enhance instream structural diversity	
Objective 21.6. Improve stream flow and connectivity for native aquatic wildlife	
Objective 21.7. Control or reduce non-native animals including bullfrogs and fish	
Goal 22: Restore streams and riparian woodland/scrub	
Objective 22.1. Restore at least 20 acres of riparian woodland/scrub in addition to that required as compensation for covered activities	Conservation Measure 2.9. Streams and Riparian Woodland/Scrub Management
Objective 22.2. Replace riparian woodland/scrub at a ratio of 1:1 in the Preserve System to compensate for its loss from covered activities (estimated to be 30 acres with maximum urban development area)	Conservation Measure 2.10. Compensate for Loss of Streams and Riparian Woodland/Scrub
Objective 22.3. Restore ecological processes and hydrologic function as listed in Conservation Measure 2.9	
Goal 23: Maintain or increase population size and distribution of Swainson’s hawk in the inventory area	
Objective 23.1. Acquire land in the Preserve System that includes occupied nests and suitable nest sites	Conservation Measure 1.1 Acquire Lands for Preserve System
Objective 23.2. Acquire 250 acres of cropland or pasture along Kellogg Creek, Marsh Creek, or adjacent to Dutch Slough that is suitable for riparian restoration within 1 mile of the Zone 6 boundary	
Goal 24: Protect, maintain, and increase populations of foothill yellow-legged frog	
Objective 24.1. Acquire land in Zone 4 along the upper reaches of Marsh Creek where high-quality breeding and dispersal habitat for foothill yellow-legged frog exists	Conservation Measure 1.1 Acquire Lands for Preserve System

Biological Goals and Objectives	Conservation Measures that Support Objectives
<p>Wetlands</p> <ul style="list-style-type: none"> Tricolored blackbird California red-legged frog California tiger salamander Giant garter snake Western pond turtle Vernal pool fairy shrimp 	<ul style="list-style-type: none"> Vernal pool tadpole shrimp Longhorn fairy shrimp Midvalley fairy shrimp Brittlescale [Grassland] Adobe navarretia

Goal 25: Preserve wetlands and ponds in the inventory area

Objective 25.1. Acquire perennial wetlands at a ratio of 1:1 of wetted acres (estimated to be 75 wetted acres with the maximum urban development area) and protect as part of the Preserve System

Objective 25.2. Acquire seasonal wetlands at a ratio of 3:1 of wetted acres (estimated to be 177 acres of seasonal wetland complex with the maximum urban development area) and protect as part of the Preserve System

Objective 25.3. Acquire alkali wetlands at a ratio of 3:1 of wetted acres (estimated to be 96 acres of alkali wetland complex with the maximum urban development area) and protect as part of the Preserve System in Zones 2, 5, and 6

Objective 25.4. Acquire ponds at a ratio of 2:1 of wetted acres (estimated to be 16 wetted acres with the maximum urban development area) and protect as part of the Preserve System

Objective 25.5. Acquire at least six of the 13 ponds in Subzone 2c to provide suitable breeding habitat for tricolored blackbird, California tiger salamander, California red-legged frog, or western pond turtle

Objective 25.6. Acquire slough/channel at a ratio of 0.5:1 of wetted acres (estimated to be 36 wetted acres with the maximum urban development area) and protect as part of the Preserve System

Objective 25.7 Acquire aquatic (open water) at a ratio of 1:1 of wetted acres (estimated to be 17 wetted acres with the maximum urban development area) and protect as part of the Preserve System

Objective 25.8: Preserve and maintain contiguous wetland-upland complexes

Objective 25.9. Preserve aquatic land cover types with sufficient upland buffer zone to protect aquatic habitat and function

Conservation Measure 1.1. Acquire Lands for Preserve System

Conservation Measure 1.3. Prepare and Implement Agricultural Management Plans for Cultivated Agricultural Lands

Conservation Measure 2.2. Wetland and Pond Management

Biological Goals and Objectives	Conservation Measures that Support Objectives
<p>Goal 26: Maintain and enhance hydrogeomorphic and ecological function of wetlands and ponds to promote covered species, native biological diversity, and habitat heterogeneity</p> <p>Objective 26.1: Maintain or increase native emergent vegetation, where appropriate</p> <p>Objective 26.2: Reduce sediment deposition and transport where appropriate</p> <p>Objective 26.3: Maintain or increase wetland and pond capacity and water duration as appropriate.</p> <p>Objective 26.4: Maintain or increase flows to and connectivity among wetlands and wetland complexes as appropriate</p> <p>Objective 26.5: Eliminate or reduce non-native animals</p> <p>Objective 26.6: Eliminate or reduce the cover of exotic plants</p> <p>Objective 26.7: Maintain or enhance upland habitat adjacent to wetlands and ponds to support the life-history requirements of wetland-dependent covered species</p>	<p>Conservation Measure 1.2. Prepare and Implement an Exotic Plant Control Program for the Preserve System</p> <p>Conservation Measure 1.3. Prepare and Implement Agricultural Management Plans for Cultivated Agricultural Lands</p> <p>Conservation Measure 2.2. Wetland and Pond Management</p>
<p>Goal 27: Restore wetlands and create ponds to compensate for loss from covered activities</p> <p>Objective 27.1: Restore perennial wetlands in-kind at a ratio of 1:1 of wetted acres (estimated to be 75 wetted acres with the maximum urban development area)</p> <p>Objective 27.2: Restore alkali wetlands in-kind at a ratio of 2:1 of wetted acres (estimated to be 64 acres of alkali wetland complex with the maximum urban development area)</p> <p>Objective 27.3: Restore seasonal wetlands in-kind at a ratio of 2:1 of wetted acres (estimated to be 118 acres of seasonal wetland complex with the maximum urban development area)</p> <p>Objective 27.4: Create ponds in-kind at a ratio of 1:1 (estimated to be 8 acres with the maximum urban development area) to support California tiger salamander, California red-legged, or western pond turtle</p> <p>Objective 27.6: Compensate for loss of slough/channel by either restoring slough/channel at a ratio of 1:1 where feasible or restoring riparian woodland/scrub in Zone 6 at a ratio of 0.5:1</p> <p>Objective 27.7: Compensate for loss of aquatic (open water) by creating ponds at a ratio of 0.5:1 (estimated to be 9 acres of ponds with the maximum urban development area) to support California tiger salamander, California red-legged, or western pond turtle</p> <p>Objective 27.8: Compensate for loss of aquatic (open water) by creating ponds at a ratio of 0.5:1 (estimated to be 9 acres of ponds with the maximum urban development area) to support California tiger salamander, California red-legged, or western pond turtle</p>	<p>Conservation Measure 2.3. Wetland Restoration and Pond Creation</p>

Biological Goals and Objectives	Conservation Measures that Support Objectives
Goal 28: Restore wetlands and create ponds to contribute to recovery of covered species	
Objective 28.1: Restore 10 wetted acres of perennial wetlands	Conservation Measure 2.3. Wetland Restoration and Pond Creation
Objective 28.2: Restore 5 wetted acres of alkali wetlands	
Objective 28.3: Restore 20 wetted acres of seasonal wetlands	
Objective 28.4: Create 8 acres of ponds to support California tiger salamander, California red-legged, or western pond turtle	
Goal 29: Enhance habitat for tricolored blackbird in the Preserve System	
Objective 29.1: Restore perennial wetlands so that at least 25% will provide breeding habitat	Conservation Measure 2.2. Wetland and Pond Management
Objective 29.2: Restore perennial wetlands to provide breeding habitat at least 1 mile from black-crowned night heron colonies and within flight distance of foraging habitat	Conservation Measure 2.3. Wetland Restoration and Pond Creation
	Conservation Measure 3.2. Minimize Predation on Tricolored Blackbird Colonies
Goal 30: Compensate for temporary and permanent loss of giant garter snake habitat	
Objective 30.1: Replace suitable upland and aquatic habitat at a ratio of 1:1 to 3:1 according to USFWS guidelines [Reconsider objective and Conservation Measure 3.6—will this result in excessive and mitigation requirements??]	Conservation Measure 3.6. Compensate for Impacts on Giant Garter Snake Habitat
Objective 30.2: Restoration on Dutch Slough will emphasize suitable habitat for giant garter snake [needs work]	
Goal 31: Maintain or increase the population and distribution of western pond turtle	
Objective 31.1: Increase number and distribution of basking sites and underwater refugia in ponds	Conservation Measure 3.7. Enhance Habitat for Western Pond Turtle
Goal 32: Compensate for loss of occupied covered shrimp habitat	
Objective 31.2: Preserve occupied habitat within the Preserve System at a ratio of 3:1 or dedicate an equivalent number of mitigation bank credits	Conservation Measure 3.8. Compensate for Loss of Occupied Covered Shrimp Habitat
Objective 31.2: Restore suitable habitat within the Preserve System at a ratio of 2:1 or dedicate an equivalent number of mitigation bank credits	
Goal 33: Protect populations of adobe navarretia within wetlands	
Objective 33.1: Identify and maintain populations of adobe navarretia in the inventory area	Conservation Measure 1.1. Acquire Lands for Preserve System

East Contra Costa County HCP/NCCP

Key Elements of Wetlands Permitting and Relationship to HCP/NCCP

(includes proposals from locals for discussion purposes)

Key Element	404 RPP	401 Cert.		1602	Notes
Administrative					
Maximum time to review completed applications	45 days	?		?	
Process for kicking indiv. projects out of regional permit program	at USACE discretion	?		--	
Outcome if no response after maximum time elapsed	Permit approved	?		?	
HCP/NCCP compliance documentation	-wetland fee receipt	-wetland fee receipt		-wetland fee receipt	(1)
	-checklist of AMMs	-checklist of AMMs		-checklist of AMMs	
	-planning survey report	-planning survey report		-planning survey report	
Where details of conservation requirements are found	HCP/NCCP	HCP/NCCP		HCP/NCCP	
How local Implementing Entity's responsibilities are memorialized	4-party MOU	4-party MOU		4-party MOU	(2)
Avoidance/Minimization					
Maximum impact per project					
Perennial or intermittent streams (linear feet)					
Ephemeral streams (linear feet)					
Riparian (acres)					
Perennial wetlands (acres)					
Seasonal wetlands (acres)					
Alkali wetlands (acres)					
Ponds (acres)					
Slough/channel (acres)					
Maximum total impact (cumulative over life of permit; these numbers are estimated over 30 year term of HCP)		SFRWQCB	CVRWQCB		
Perennial or intermittent streams (linear feet)	4,225	1,500	3,000	4,225	(0.8 miles)
Ephemeral streams (linear feet)	26,400	21,120	7,900	--	(5.0 miles)
Riparian (acres)	35	21	15	35	
Perennial wetlands (acres)	75	12	69	75	(3)
Seasonal wetlands (acres)	59	13	51	59	(3)
Alkali wetlands (acres)	32	0	32	32	
Ponds (acres)	8	6	2	8	
Slough/channel (acres)	73	0	73	73	
Other Requirements					
Stream setback requirements for urban development	Table 6-2 CM 1.7	Table 6-2 CM 1.7		Table 6-2	(4)
Maintain pre-project hydrology	--	CM 1.10		--	C.3 requirements

Key Element	404 RPP	401 Cert.	1602	Notes
BMPs for flood control projects	CM 1.13	CM 1.13	CM 1.13	
General wetland avoidance and minimization measures	CM 2.12	CM 2.12	CM 2.12	
Mitigation/Conservation				
<i>Wetland Preservation and Restoration</i>				
Required wetland preservation ratios	Table 5-5	Table 5-5	Table 5-5	
	CM 1.1	CM 1.1	CM 1.1	
Required restoration ratios	Table 5-16	Table 5-16	Table 5-16	
	CM 2.1, 2.3, 2.10	CM 2.1, 2.3, 2.10	CM 2.1, 2.3, 2.10	
Required restoration setback from urban development	Table 5-6 CM 1.1	Table 5-6 CM 1.1	Table 5-6 CM 1.1	
Required wetland fee	Table 9-5	Table 9-5	Table 9-5	
Requirement for preservation and restoration to stay ahead of impacts	CM 1.1	CM 1.1	CM 1.1	
	CM 2.1	CM 2.1	CM 2.1	
<i>Watershed Preservation and Enhancement</i>				
Protection of terrestrial land cover types in inventory area (acres)	Table 5-7	Table 5-7	Table 5-7	
Assurances about geographic distribution of preservation and enhancement: conservation strategy + ? (watershed specific minimum goals? or minimum goals by Regional Board jurisdiction?)				

Notes:

- (1) Developer fee for wetlands paid but check not cashed until wetland permits approved (?)
- (2) An MOU between the Corps (2 districts?), the RWQCBs (2 Boards), Fish and Game and local Implementing Entity is proposed.
- (3) Assumes 25% of undetermined wetlands are seasonal wetlands and 75% are perennial wetlands
- (4) "CM" is short for "Conservation Measure", the name given to conservation actions in the HCP/NCCP

Elements of the East Contra Costa County
HCP/NCCP
Related to Wetlands Permits

Agency Review Draft HCP/NCCP
January 2005

Table 5-5. Required Preservation Ratios and Estimated Acquisition Requirements for Aquatic Land-Cover Types under Both Urban Development Area Scenarios

Aquatic Land Cover Type	Estimated Impact ¹ (acres)	Required Preservation Ratio	Estimated Preservation Requirement ¹ (acres)	Minimum Available in Acquisition Analysis Zones ² (acres)
Riparian woodland/scrub	35	2:1	70	205
Wetlands and Ponds				
Perennial wetlands ³	75 ³	1:1	75	232 ³
Seasonal wetlands ³	59 ³	3:1	177	173 ⁴
Alkali wetland	32	3:1	96	168
Ponds	8	2:1	16	80
Slough/channel	73	0.5:1	36.5	137
Aquatic (open water)	17	1:1	17	123
Total Aquatic Land Cover Types (acres)	299		697	1,118
Streams (miles) ⁵	4.6	2:1 or 1:1 ⁵	5.2 ⁵	258

Notes:

¹ Impact estimates are based on the maximum urban development area (Table 4-3). Actual acquisition requirements will be based on field-delineated resources at impact sites and application of the required preservation ratios in this table. Restoration, creation, and enhancement of aquatic land cover is required in addition to preservation of aquatic land cover as compensation for impacts. See Conservation Measures 2.1.1 and 2.2.2 for these requirements.

² Many land cover types were underestimated in the mapping conducted for this HCP/NCCP, so these figures represent minimum acreages of what is available for preservation. See Chapter 3 for a discussion of the mapping limitations.

³ Undetermined wetlands could be seasonal wetlands or perennial wetlands (e.g., freshwater marsh). Seasonal wetlands will be mitigated at a preservation ratio of 3:1; perennial wetlands will be mitigated at a preservation ratio of 1:1. This table assumes 75% of undetermined wetlands are perennial wetlands and 25% are seasonal wetlands. Often, seasonal wetlands mapped were wetland complexes of small pools; impacts and preservation ratios apply only to wetted acres of seasonal wetlands.

⁴ The actual amount of seasonal wetlands available for preservation in the inventory area is unknown because of a lack of field surveys. The allowable impact to seasonal wetlands by covered activities will be capped at the amount required to preserve seasonal wetlands at the required 3:1 ratio. For example, if only 30 acres are preserved, allowable impacts will be capped at 10 acres.

⁵ Stream preservation will be required at a 2:1 ratio for perennial streams, and a 1:1 ratio for ephemeral or intermittent streams. Maximum allowable impacts are 0.6 miles for perennial and intermittent streams and 4.0 miles for ephemeral streams.

Table 5-6. Minimum Distance from Dense Urban Development Required for Aquatic Land-Cover Types to Count Toward Land Acquisition or Restoration/Creation Requirements

Land-Cover Type	Minimum Distance Required for Credit	Rationale and Sources
Permanent wetland	750 feet	Perennial wetlands may support a variety of covered species including tricolored blackbird, California red-legged frog, and western pond turtle. Tricolored blackbirds may be sensitive to disturbance and predation from urban pets, so a relatively large buffer is required. 750-foot is the approximate distance below which available upland habitat for pond-breeding covered species begins to diminish substantially (Reese 1996 [Western pond turtle]; Trenham 2001[California tiger salamander]; Semlitsch and Bodie 2003 [U.S. amphibians]).
Seasonal wetland	100 feet if wetland is up-gradient from development; 500 feet if wetland is down-gradient of development	Seasonal wetlands may support a variety of covered species including alkali plants and covered invertebrates. Buffer requirements for these habitats and species are unknown, but habitat function may decline if wetlands are located within 100 feet of dense urban development. Hydrologic effects of development can be severe if seasonal wetland is located down-gradient.
Alkali wetland	50 feet or the wetland watershed boundary, whichever is less 250 feet if wetland is down-gradient of development	Alkali wetlands in the inventory area support unique vegetation communities but few covered species (only recurved larkspur, San Joaquin spearscale, and brittlescale at wetland margins). Alkali wetland function for plants can be maintained in relatively close proximity to urban development as long as access controls specified in the conservation strategy are maintained.
Pond	750 feet from pond edge	This is the approximate distance below which available upland habitat for pond-breeding covered species begins to diminish substantially (Reese 1996 [Western pond turtle]; Trenham 2001[California tiger salamander]; Semlitsch and Bodie 2003 [U.S. amphibians]).
Stream	150 feet from top of bank	This setback is recommended by many authors to maintain stream physical properties (e.g., sediment and nutrient reduction, moderation of stream temperature, channel complexity), salmonid habitat, plant diversity, and other functions (see Table 5-17 for citations).
Riparian woodland/scrub	150 feet from vegetation dripline	The minimum stream buffer required in Conservation Measure 1.7 (Chapter 6) is 75 feet. The land acquisition credit limit accounts for the loss of riparian habitat function within this buffer and the estimated loss of some value for riparian birds and amphibians beyond it (see Table 5-17).

Table 5-7. Land Acquisition Requirements for Terrestrial Land-Cover Types under the Initial Urban Development Area Scenario (acres)

	Total in Inventory Area	Inside Parks and Open Space ¹ (%)	Outside Parks and Open Space	Estimated and Allowable Impact ² (% of outside)	Remain Outside Parks and Open Space	HCP/NCCP Preservation Requirement for Compensation and Recovery ³ (% Remaining Outside Parks & Open Space)	Minimum Preserved ⁴ (% of Total after Impacts)
Annual grassland	59,133	24,353 (41%)	34,781	2,377 (7%)	32,404	13,000 (40%)	37,353 (66%)
Alkali grassland	1,997	379 (19%)	1,618	123 (8%)	1,495	900 (60%)	1,279 (68%)
Oak savanna	5,894	2,694 (46%)	3,200	54 (2%)	3,146	500 (16%)	3,194 (55%)
Oak woodland	24,198	12,284 (51%)	11,914	61 (1%)	11,853	400 (3%)	12,684 (53%)
Chaparral/scrub	3,016	2,225 (74%)	791	5 (1%)	786	550 (70%)	2,775 (92%)
Cropland and pasture	25,866	1,149 (4%)	24,717	4,310 (17%)	20,407	250 (1%)	1,399 (6%)
Total	120,105	43,084 (36%)	77,021	6,930 (9%)	70,091	15,600 (22%)	58,684 (52%)

¹ See Table 2-2 for definition of parks and open space.

² Assumes the initial urban development area. The percentage is the proportion of the land cover type outside public lands and open space.

³ These acreage requirements represent the minimum required under the HCP/NCCP to compensate for impacts of covered activities and contribute to the recovery of covered species. Actual acquisition of these land cover types may be greater than the minimum requirements due to parcel boundaries including non-target land cover types.

⁴ Min. preserved = HCP/NCCP requirement + existing parks and open space. More of each land cover type is expected to be preserved due to need to acquire parcels rather than specific areas of each land cover type. The percentage is the proportion of the land cover type preserved in existing public lands and HCP/NCCP Preserves after full HCP/NCCP implementation (i.e., after impacts have occurred).

Table 5-16. Restoration and Creation Requirements for Land-Cover Types under Initial Urban Development Area Scenario

Land cover type	Required Compensation Ratio		Estimated Impact (acres)	Estimated Compensation (acres)	Restoration or Creation Required to Contribute to Recovery (acres)	Estimated Total Restoration or Creation (acres)
	Restoration	Creation				
Oak savanna	1:1	–	54	54	0	54
Riparian woodland/scrub	1:1	–	30	30	20	50
Wetlands and Ponds						
Perennial wetland	1:1	–	74 ¹	74	10	84
Alkali wetland ²	2:1	–	29	58	5	63
Seasonal wetland ²	2:1	–	46 ¹	92	20	112
Ponds	–	1:1	7	7	8	15
Slough/channel	0.5:1 riparian ³	–	73	37 (riparian)	0	37 (riparian)
Aquatic (open water)	–	0.5:1 ponds ³	17	9 (ponds)	0	9 (ponds)
Total			330	361	63	424
Perennial or intermittent streams (miles)	1:1 ⁴	1:1 ⁴	0.6	0.6	0	0.6

Notes:

- ¹ Undetermined wetlands are either seasonal wetlands or perennial wetlands. Mitigation of seasonal wetlands will be accomplished through restoration at 2:1. Mitigation of perennial wetlands will be accomplished through in-kind creation at 1:1. This table assumes 75% of the undetermined wetlands are perennial wetlands and 25% are seasonal wetlands.
- ² Seasonal and alkali wetland acreage was quantified as the minimum polygon encompassing clusters of seasonal pools or drainages (i.e., wetland complexes). Impacts and restoration requirements will be tracked by jurisdictional wetland boundary, so estimates in this table overstate the expected impacts to these land cover types.
- ³ Loss of slough/channel will be compensated by either restoring slough/channel at a 1:1 ratio or restoring riparian woodland/scrub at a 0.5:1 ratio (see text). These calculations assume all slough/channel impacts will be compensated through riparian woodland/scrub restoration because of the limited opportunities for slough/channel creation. Loss of open water will be compensated by creating ponds (see text).
- ⁴ Streams will be restored where feasible. Where stream restoration is not feasible, out-of-kind creation of seasonal wetlands or permanent wetlands will be required to replace some of the functions of the lost stream. See Conservation Measure 2.10 for more details.

Table 6-2. Stream Setback Minimum Requirements and Recommendations for Streams within the Urban Limit Line

Stream Reach Type	Buffer Objective/Function (from figure 5-11)	Example Sites in Inventory Area	Minimum Setback/ Recommended Setback ¹ (from top of bank)	Comments
Concrete-lined channels	Enhance water quality; retain restoration potential	Reaches of Kirker Creek	20 ft*/50 ft	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.
Perennial or intermittent streams in urban areas except Marsh Creek and tributaries	Enhance water quality; retain restoration potential	Lower Willow Creek, Lower Kirker Creek	50 ft*/100 ft	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 or intermittent streams in agricultural or natural areas except Marsh Creek and its tributaries	Enhance water quality; retain restoration potential	Kellogg Creek, Brushy Creek	75 ft* /150 ft	These reaches retain the greatest habitat value and potential for restoration within the Urban Limit Line. The buffer will filter sediment and other contaminants, allow for restoration of riparian vegetation and some small floodplain areas, as well as providing recreation opportunities.
Ephemeral reaches	Erosion and nutrient control;	Multiple unnamed tributaries to intermittent and perennial reaches	25 ft*/50 ft	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 three stream types above, the primary objective of the setback for ephemeral streams is to filter out sediment and contaminants before they degrade downstream habitat.
Marsh Creek and its tributaries [We may add more specific streams or reaches]	Enhance water quality; retain restoration potential		75 ft*/150 ft	Marsh Creek provides the some of the highest stream and riparian habitat values in the inventory area and the greatest potential for restoring habitat for a variety of species. Wider buffers on Marsh Creek and its tributaries will retain restoration potential, maintain habitat for

Stream Reach Type	Buffer Objective/Function (from figure 5-11)	Example Sites in Inventory Area	Minimum Setback/ Recommended Setback ¹ (from top of bank)	Comments
				covered species, and improve water quality.

* 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 Contra Costa County stream ordinance [**Will add details of County ordinance here**]

Notes:

¹ Minimum setbacks could be reduced based on site-specific conditions such as barriers to human access and topography. Setback compliance will be determined by the local jurisdiction; exceptions from minimums in this table will be granted based on site conditions.

Table 9-5. Wetland Fee and Acreage Determination Methods

Land Cover Type	Fee per unit of Impact ¹	Required Mitigation Ratio	Method for Determining Fee Boundary
Riparian woodland/scrub	\$57,000/acre	1:1	Limit of tree or shrub canopy (drip line)
Perennial wetlands	\$78,000/acre	1:1	Jurisdictional wetland boundary of state or federal government ² , whichever is greater
Seasonal wetland	\$169,000/acre	2:1	Same as above
Alkali wetland	\$160,000/acre	2:1	Same as above
Ponds	\$85,000/acre	1:1	Jurisdictional waters boundary of state or federal government ² , whichever is greater
Aquatic (open water)	\$43,000/acre	0.5:1	Wetted area during normal rainfall year or jurisdictional waters boundary, whichever is greater
Slough/channel	\$49,000/acre	0.5:1	Area of impact within banks
Streams	\$69/linear foot	1:1	Linear distance of stream centerline

¹ See Appendix G for calculation of fee by wetland type. Wetland fee takes mitigation ratio into account.

² Using methods for determining state and federal jurisdictional waters and wetlands at the time of HCP/NCCP approval or the current approved methodology, whichever results in a larger boundary.

Chapter 5

Conservation Strategy [Elements relevant to Wetlands]

Habitat Enhancement, Restoration, and Creation

The primary means of mitigating impacts on and conserving covered species and natural communities is preservation of high-quality habitat in accordance with the preserve design criteria outlined above. In order to meet regulatory requirements and to contribute to the recovery of covered species, habitat enhancement, restoration, and creation are also important components of the conservation strategy. Some vegetation communities or land-cover types that are lost to covered activities will be replaced with the same or similar communities or land-cover types within the HCP/NCCP preserves. Habitat enhancement, restoration, and creation ensure that there will be no net loss of certain resources (e.g., wetlands, breeding habitat for specific covered species). In other cases, restoration and enhancement are used to supplement preservation to adequately mitigate the loss of vegetation communities or land-cover types. Many habitat restoration requirements exceed those typically required for individual projects in order to contribute to the recovery or prevention of listing of covered species that these habitats support. Depending on the resource, creation, restoration, or enhancement is required as part of the conservation strategy. Habitat enhancement, restoration, and creation will occur in addition to, not as a substitute for, land preservation. Each of these terms is defined below.

Habitat Enhancement

Habitat enhancement is the improvement of an existing degraded vegetation community. Enhancement involves improving one or more ecological factors, such as native species richness, species diversity, overall vegetative cover, and wildlife habitat function. Habitat enhancement activities typically occur on substrates that are largely intact. An example of enhancement would be planting blue oak seedlings in an existing stand of blue oaks to increase blue oak cover and density and improve the age-class structure of the blue oak population. Improving wildlife habitat function might include removing barriers or hazards to movement such as roads or fences.

The measures of enhancement will differ according to each natural community and site. For example, some communities in the inventory area have inherently low productivity, low species richness, or low vegetation cover (e.g., alkali sink scrub). Enhancement of these communities may be measured by percent cover of native plants or the lack of soil compaction. The appropriateness of habitat enhancement will be considered on a site-by-site basis and in the context of the entire Preserve System. Habitat enhancement will be undertaken within the preserves to enhance the populations of all covered species and maintain or enhance ecological processes.

Habitat Restoration

Habitat restoration is the establishment of a vegetation community in an area that historically supported it, but no longer does because of the loss of one or more required ecological factors. Restoration may involve altering the substrate to improve a site's ability to support the historic vegetation community. For example, riparian woodlands could be restored to stream reaches that historically supported them. Habitat restoration is allowed in those vegetation communities or land-cover types for which techniques are generally successful and where restoration would substantially enhance habitat for covered species and native biological diversity. Habitat restoration is allowed only in the HCP/NCCP preserves, except in cases where sufficient sites are not available. In these cases, restoration will be allowed on public lands adjacent to an HCP/NCCP preserve (see Conservation Measure 2.1 for more details).

It should be noted that habitat restoration may not restore all functions of natural communities. Recent studies of wetland restoration projects indicate that many of them fail to meet success criteria or lack important functions of natural reference sites (National Research Council 2001). The conservation strategy takes this uncertainty into account by relying primarily on habitat preservation for mitigation and by requiring habitat restoration in amounts exceeding typical mitigation ratios. Also, uncertainty is taken into account by the adaptive management strategy (see Chapter 7, *Monitoring and Adaptive Management Program*).

Habitat Creation

Habitat creation is the establishment of a vegetation community in an area that did not previously support it. For example, ponds can be created as breeding habitat for California red-legged frog by grading and installing check dams in areas along streams that did not previously support ponds. This type of habitat creation must be balanced by the need to maintain and enhance stream functions. Habitat creation should occur in damaged or disturbed areas whenever possible to minimize the loss of existing habitats by the creation of new ones.

In-kind/like-function habitat creation is the establishment of the same vegetation community as the vegetation community affected by the covered activity, and

that would establish the same type of ecological functions over time. For example, creating an artificial vernal pool with species similar to those found in a vernal pool filled by covered activities would be in-kind/like-function creation.

Out-of-kind/like-function creation of habitat is the establishment of a different vegetation community with some of the same ecological functions as the affected vegetation community. For example, it may not be feasible to create streams to replace the functions of those streams removed to make way for development. In this instance, ponds or seasonal wetlands may be created as out-of-kind mitigation for impacts on streams. Ponds and seasonal wetlands can provide equal or greater function than streams as habitat for some wildlife species and less function for other species.

Conservation Measure 1.1. Acquire Lands for Preserve System [in part]

The Implementing Entity will establish the Preserve System through acquisition of land in fee title, conservation easement, mitigation banking, or land dedication. Lands will be acquired from willing sellers in keeping with the patterns and procedures described below. Land will be acquired that supports functioning vegetation communities and covered species habitat and that may contain sites suitable for restoration or creation of vegetation communities and habitat.

Field-Verified Conditions

Land-cover data, species distribution data, and species habitat models were developed for this HCP/NCCP at a regional scale and general level of resolution. These data and models were used in this HCP/NCCP to estimate impacts of covered activities and to develop a sound conservation strategy for the inventory area at a regional scale. These data and models are not intended for site-specific planning because of their low resolution and the lack of field verification. Project proponents must verify in the field all land-cover types and suitable habitat for covered wildlife species as described in Chapter 6.

- All requirements in this conservation strategy for land-cover preservation, species habitat preservation, and covered plant species preservation will be verified in the field through planning surveys. The Implementing Entity will conduct planning surveys for land-cover type and covered species habitat on all lands considered for acquisition to measure in the field whether the proposed acquisition site meets HCP/NCCP requirements. The details of these land acquisition planning surveys are described in Chapter 8.

Land Acquisition Requirements for Wetlands, Ponds, Streams, and Riparian Woodland/Scrub

All wetlands, ponds, and streams will be delineated in the field prior to impacts and land acquisition (see Chapter 6). To mitigate impacts on these aquatic land-cover types, the Implementing Entity will acquire these land-cover types in kind within preserves according to the ratios in Table 5-5.

Wetlands and streams exhibit a high degree of biological, physical, and hydrologic diversity in the inventory area. Consequently, it is important to preserve, enhance, restore, or create the full diversity of these land-cover types as they occur in the area. Wetland delineations conducted prior to wetland impacts will be used, in part, to classify wetland types lost to ensure that the same types are being acquired within HCP/NCCP preserves. In addition, vegetation in wetlands and streams will be classified at the association or alliance level (rather than as a single land-cover type) in order to help ensure that a diversity of communities is preserved. It is also important to preserve adequate uplands and buffer zones around wetlands, ponds, and streams to maintain their hydrologic function and provide adequate upland habitat for aquatic covered species (see also Conservation Measures 2.2, 2.9, 2.10, and 2.12).

Mitigation will also include creation, restoration, or enhancement of aquatic land-cover types as described in Conservation Measures 2.2 and 2.3 (Wetland Restoration Program). In order to conserve and recover covered aquatic and riparian species in the Plan area, the Implementing Entity will create or restore key aquatic land-cover types within preserves above and beyond the mitigation requirements. These requirements are also described in Conservation Measures 2.2, 2.3, 2.9, 2.10, and 2.12.

Impacts on all aquatic land-cover types will be limited to the amount of the same land-cover type available for acquisition in accordance with the preservation ratios in Table 5-5. Preservation ratios were determined on the bases of the following factors.

- The rarity and irreplaceability¹ of the land-cover type within the inventory area (rarer and more irreplaceable land-cover types have higher ratios).
- The biological value of the land-cover type (e.g., overall biological diversity, function as habitat for covered species, ecosystem function).
- Standard mitigation ratios used by state and federal regulatory agencies (these ratios were used as starting points rather than guides for this Plan).

Avoidance and minimization of impacts on aquatic land-cover types (see Conservation Measure 2.12) at proposed project sites may reduce the amount of preservation area required if preserved aquatic land-cover types meet minimum distance requirements from dense urban development (see *Buffer Zones* below). Once preservation sites with the appropriate aquatic land-cover type are no

¹ A habitat or land-cover type is irreplaceable if it cannot be restored or created elsewhere due to unique soil requirements (which cannot be recreated), topography, or other small-scale conditions.

longer available in the inventory area, impacts on that land-cover type will no longer be covered under this HCP/NCCP unless an alternative mitigation strategy can be developed. Based on a detailed regional wetlands inventory (see Appendix K), each aquatic land-cover type occurs in sufficient quantity in the Acquisition Analysis Zones to meet expected preservation needs except for seasonal wetlands. If key sites are not available from willing sellers, alternative mitigation approaches will be evaluated by the Implementing Entity on a case-by-case basis. For example, in lieu of preservation, mitigation options could include restoring aquatic land-cover types at a greater ratio than that required by the HCP/NCCP. For seasonal wetlands, allowable impacts will be capped at one-third of the amount of seasonal wetlands preserved by the Implementing Entity (to meet the 3:1 preservation ratio requirement).

The HCP/NCCP land-cover inventory identified 448 acres of riparian woodland/scrub in the inventory area, with 97 acres (22%) in existing public lands. According to the land-cover mapping, 205 acres of riparian woodland/scrub is available for acquisition within the Zones. The remaining 243 acres occurs along streams in existing and proposed future urban areas. Credit for land acquisition of riparian woodland/scrub will be given within the Zones or within the ULL along Marsh Creek. An exception is provided for lower Marsh Creek because of its particular value for a number of covered and native species; this exception is part of the conservation strategy described below. For example, lower Marsh Creek provides some of the best opportunities for restoration of riparian woodland/scrub in the inventory area (Natural Heritage Institute 2002; Natural Heritage Institute and Delta Science Center 2002). Expanding existing stands of riparian woodland/scrub along lower Marsh Creek will benefit Swainson's hawk by increasing available nesting sites within 1 mile of suitable foraging habitat (i.e., cropland and pasture) (Estep pers. comm.). Expanding riparian woodland habitat along lower Marsh Creek would also enhance native fisheries (see Appendix C).

Preservation of streams will be accomplished according to whether a stream is perennial, intermittent, or ephemeral; these terms are defined in USACE regulations and in the Glossary (Appendix I). Impacts on perennial or intermittent streams are expected from routine road maintenance, bridge replacement, or new road crossings. These impacts will be mitigated at a preservation ratio of 2:1 to ensure that these high-value streams are extensively preserved by the Plan.

Impacts on ephemeral creeks are expected to occur primarily within the Willow Creek watershed (Appendix K) where urban expansion of Pittsburg will extend into the upper watershed areas. Because it is not practicable for development to avoid the many ephemeral creeks in this area, they are likely to be filled. Impacts on ephemeral streams will be mitigated at a preservation ratio of 1:1 because ephemeral creeks provide lower biological and hydrologic value than perennial or intermittent streams. Typically, ephemeral creeks do not provide unique habitat for any covered species.

Mitigation for impacts on streams will include in-kind compensatory habitat restoration (e.g., creating meanders in existing channelized streams, removing concrete lining) and out-of-kind restoration of wetland and pond habitats. Restoration compensation for impacts on perennial streams may be accomplished through enhancement of riparian woodland/scrub. Restoration compensation for impacts on intermittent streams may be accomplished through enhancement of perennial or intermittent streams. Restoration compensation for impacts on ephemeral creeks (ephemeral creeks were not mapped in the HCP/NCCP inventory) can be accomplished through wetland restoration. In addition to compensatory restoration, the Implementing Entity will conduct stream, wetland, and pond restoration to help recover California red-legged frog and foothill yellow-legged frog in the Plan area. See Conservation Measures 2.2 and 2.3 for more details.

Note that project proponents that receive take authorization under this HCP/NCCP and that wish to fill waters of the United States must obtain separate permits and certification from USACE and RWQCB, respectively, to comply with CWA Sections 404 and 401.

Buffer Zones

New development in participating jurisdictions adjacent to HCP/NCCP preserves is required to set back certain land uses from the preserve boundary to provide a buffer zone between the preserve and intensive urban development (see Conservation Measure 1.8 in Chapter 6). Buffer zones are designed 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.

When the Implementing Entity acquires land adjacent to existing dense urban development that has no buffer zone, or an inadequate buffer zone, one must be created on the preserve to reduce fuel loads and minimize fire hazards to adjacent development from preserve management activities. To account for this loss of habitat function, any area adjacent to development disked for fuel management (e.g., 30–50 foot width) will not be credited towards land acquisition requirements. The remainder of any buffer zone may be credited towards terrestrial land cover or species habitat preservation requirements because they will provide habitat for some species and serve an important function. However, aquatic land-cover types and aquatic covered species breeding habitat without sufficient buffer zones will not be credited toward meeting preservation requirements because their proximity to intensive urban development can greatly reduce their habitat value for covered species. See Table 5-6 for minimum setback distances required for aquatic land-cover types to be counted towards Plan goals for land acquisition and habitat restoration.

Jump-Start Guidelines and Stay-Ahead Requirements

The timing and sequence of land acquisition relative to impacts of covered activities is critical to the success of the HCP/NCCP. Land acquisition or purchase of easements must stay ahead of any impacts on vegetation communities and covered species habitat resulting from covered activities. This

sequence ensures that impacts of development do not occur before adequate mitigation is identified for them, secured, and functioning. (However, some habitat restoration may require a longer time to produce functional habitat). To meet this *Stay-Ahead* provision at the beginning of HCP/NCCP implementation, some land should be acquired prior to any permits being issued under the HCP/NCCP to *jump start* the Preserve System. However, given the difficulty of acquiring land prior to collecting fees under the Plan, the Jump-Start provision is a guideline.

The NCCPA requires that implementation of mitigation and conservation measures be “roughly proportional in time and extent to the impact on habitat or covered species authorized under the plan” (California Fish and Game Code Section 2820[b][9]). To meet the requirements of this section, CDFG requires that NCCPs make progress towards the final conservation goals (i.e., the ultimate size and configuration of the Preserve System) in proportion to the impacts of covered activities. The Stay-Ahead provision in this Plan addresses this requirement.

Jump-Start Guidelines. The Implementing Entity should acquire at least 500 acres of land before issuance of ESA and NCCPA permits according to the land cover and habitat requirements listed in Table 5-15. Jump-start guidelines recommend approximately 2% of the expected preservation requirement and represent an aggressive but realistic goal for land acquisition prior to permit issuance. If these resources are not acquired in amounts sufficient to offset impacts (see Chapter 6), then coverage for these impacts cannot be extended by local jurisdictions.

Stay-Ahead Requirement. During the first year after permit issuance, the Implementing Entity will be establishing its structure, collecting initial HCP/NCCP fees, and actively pursuing land acquisition deals with willing landowners (see Chapter 8 for more details on implementation). To allow the Implementing Entity to accumulate enough funds to purchase land from willing sellers, the Stay-Ahead provision will only apply after 1 year of Plan implementation.

After 1 year of implementation, the Implementing Entity must abide by at least one of the following two Stay-Ahead requirements during the first 10 years of the permit term (i.e., from the beginning of Year 2 to the end of Year 10). The Implementing Entity will strive to achieve both requirements but compliance will only be measured against one of the two options for the first 10 years. After Year 10, the Implementing Entity is required to meet only the first Stay-Ahead provision. Two options are available to provide the Implementing Entity with more flexibility for land acquisition in the early stages of Plan implementation and to provide an incentive for land acquisition in key areas of the inventory area.

1. The amount of each land-cover type acquired by the Implementing Entity as a proportion of the total requirement for each land-cover type must be equal to or greater than the proportion of the impact on that land-cover type

expected under the maximum urban development area scenario by all covered activities. For example, if 25% of the expected impacts on oak woodland have occurred, then at least 25% of the required land acquisition for oak woodland must also have occurred. The exceptions to this rule are annual grassland, ruderal habitat, and cultivated agriculture (cropland, irrigated pasture, vineyard, orchard), which will be aggregated for the purposes of measuring compliance with the Stay-Ahead requirement. That is, the sum of the impacts on these landcover types will be measured for Stay-Ahead purposes against the sum of their acquisition requirements.

OR

2. The amount of annual grassland acquired by the Implementing Entity in Zone 2 as a proportion of the total requirement for annual grassland acquisition in Zone 2 (see Table 5-14) must be equal to or greater than the proportion of the impacts on annual grassland and all cultivated agriculture land-cover types (cropland, irrigated pasture, vineyard, orchard), expected under the maximum urban development area scenario by all covered activities. For example, if 40% of the expected impacts on annual grassland and cultivated agriculture land-cover types have occurred, then at least 40% of the required acquisitions of annual grassland in Zone 2 must also have occurred. This option provides an incentive for the Implementing Entity to acquire land in Zone 2 early in Plan implementation because land in this zone is likely to be more expensive and at higher risk than land in other zones.

The Plan allows a 10% deviation from the strict requirements above without penalty to account for the likely pattern of infrequent land acquisition in large parcels. This allowable deviation will apply to either method employed by the Implementing Entity to calculate compliance with Stay-Ahead requirements.

Land acquired in full or in part by state or federal agencies to contribute to species recovery under this Plan will also contribute to compliance with the Stay-Ahead requirement. Because a portion of the Plan's conservation actions depend on contributions committed by the state and federal governments, the Implementing Entity's compliance with Stay-Ahead requirements will depend in part on the fulfillment of these commitments. The Implementing Entity must recognize, however, that funds from public agencies will be available on budget cycles that may or may not correspond to the timing of covered activities in the permit area. Therefore, the Implementing Entity must acquire land on its own and cannot rely solely on the timely availability of state or federal funds to acquire land.

The Stay-Ahead provision will be evaluated on an annual basis (beginning at the end of Year 2) to determine if the "rough proportionality" standard of NCCPA is being met. If it is not met, the Implementing Entity, CDFG, and USFWS will meet within 45 days to review the situation and determine an appropriate course of action. If, after the exercise of all available authority and utilization of all available resources, the federal and state contribution committed to the Plan cannot be provided in order to meet the Stay-Ahead provision, the Plan and the

Stay-Ahead provision will be reevaluated in light of these limitations, with possible adjustments made to the permit coverage and assurances, given the extent of the federal/state contribution.

Conservation Measure 2.1. Enhance, Restore, and Create Land-Cover Types and Species Habitat

Measure

Enhancement, restoration, or creation is required for impacts on some land-cover types to ensure no net loss of these land-cover types, to replace the functions of vegetation communities and species habitat lost to covered activities, and to contribute to the recovery of covered species. These requirements are in addition to the preservation requirements described in Conservation Measure 1.1. Table 5-18 lists the type of replacement that is required for each land-cover type. Enhancement is required for all land-cover types to improve the function of natural communities, maintain or enhance populations of covered species, and increase native biological diversity within the preserves. Enhancement will be accomplished through the conservation measures listed in Table 5-18.

Land-cover restoration or creation will be conducted for land-cover types that have been lost or seriously degraded due to past activities, and for which restoration is feasible and success has been demonstrated elsewhere: oak savanna, riparian woodland/scrub, wetlands, and streams (Table 5-18). Where restoration is infeasible, in-kind or out-of-kind/like-function creation of land-cover types is required.

Restoration and creation will be accomplished in two ways. The Implementing Entity will be required to compensate for impacts of covered activities on specific land-cover types through either restoration or creation at the ratios listed in Tables 5-16 or 5-17 for the initial urban development area or maximum urban development area, respectively. These ratios were determined on the basis of current regulatory standards for compensation and the likelihood of successful restoration. For example, oak savanna, riparian woodland/scrub, perennial wetlands, and ponds have ratios of 1:1 because replacement of these land-cover types is relatively simple, techniques are proven, and there is a high likelihood of success. Ratios for alkali wetland and seasonal wetland are 2:1 because of the greater difficulty in restoring these land-cover types and lower chance of success. Alkali wetland and seasonal wetland are also rare in the inventory area, so compensation should be undertaken at a higher ratio.

The actual acreage of compensation will be determined through planning surveys conducted at project sites to determine the actual extent of impacts (see Chapter 6, *Conditions on Covered Activities*). The Implementing Entity will also restore or create land-cover types to contribute to the recovery of covered species. Tables 5-16 and 5-17 list the acreage requirements for recovery contributions that are required in addition to compensatory habitat restoration and creation.

Restoration and creation will be coordinated with preserve design efforts. Preserve land acquisition will be conducted to incorporate areas suitable for restoration or creation of land-cover types necessary to meet HCP/NCCP requirements. Restoration and creation will be designed within preserves to meet the goals and objectives for each relevant habitat and covered species. Land-cover restoration and creation will increase habitat for specific life history requirements of covered species. Sites selected for restoration will support soils and topography suitable for restoring the target land-cover type that was historically present at the site. Restoration and creation will be designed and constructed to avoid or minimize direct or indirect impacts on existing functioning habitat for covered species.

All habitat enhancement activities will be conducted within HCP/NCCP preserves. Restoration and creation of habitat will also be conducted in HCP/NCCP preserves except in rare instances. If no suitable sites are present or actions are not biologically practicable in HCP/NCCP preserves (e.g., because they may substantially adversely affect habitat for a covered species), then restoration and creation may be conducted on lands in the inventory area permanently protected for conservation (e.g., owned by EBRPD, CDP, CCWD, or a local land trust, or on a private mitigation bank²). Such habitat restoration and creation sites must be located in areas of existing protected lands that are managed consistently with HCP/NCCP Preserve System principles. To allow restoration to occur on lands outside the HCP/NCCP Preserve System, the Implementing Entity will enter into a binding agreement with the landowner ensuring that management of the area surrounding the restoration site will continue to be consistent with the HCP/NCCP. The Implementing Entity may share management responsibilities of the site and must maintain access in order to monitor restoration development.

Habitat restoration and creation conducted on existing conservation lands will be funded and conducted by the Implementing Entity. Responsibilities for ongoing management and monitoring of these sites will be determined on a case-by-case basis but will always be funded by the Implementing Entity. Every effort will be made to find suitable restoration or creation sites in HCP/NCCP preserves.

Restoration or creation conducted as mitigation for impacts must stay ahead of impacts, just as land acquisition must stay ahead of impacts (see Conservation Measure 1.1). Restoration or creation that contributes to recovery effects can be implemented at any time. Restoration or creation conducted to mitigate impacts must be initiated so that mitigation requirements are ahead of impacts on each land-cover type by at least 5%. For example, if after 5 years, impacts on oak savanna total 20 acres, the Implementing Entity must initiate at least 22 acres of oak savanna restoration. If restoration or creation cannot keep pace with impacts, then impacts cannot be permitted under the HCP/NCCP.

² See Chapter 8, *Plan Implementation*, for more details on when private mitigation banks can be used for credit under the HCP/NCCP.

As described in the preserve assembly measure (Conservation Measure 1.1), a major focus in Zone 6 is acquisition of land along Marsh Creek, Kellogg Creek, or adjacent to Dutch Slough to provide opportunities for restoration of riparian woodland/scrub. Most of the riparian woodland/scrub restoration required by this Plan is expected to occur on these sites (see Figures 5-2 and 5-3). The Implementing Entity must also consider investing habitat restoration effort on Dutch Slough. According to preliminary assessments, there are opportunities for extensive restoration on the site for wetland and upland habitat consistent with the restoration requirements of this Plan (see Conservation Measures 2.1, 2.3, 2.7, and 2.10) including seasonal marsh and floodplain (137 acres), mixed riparian-oak woodland (82 acres), and emergent marsh (224 acres) (California Coastal Conservancy 2002). The Implementing Entity could contribute significantly to the goals of the Dutch Slough project and help meet HCP/NCCP requirements for restoration. Several covered species have been observed on or near Dutch Slough, including Swainson's hawk, western pond turtle, and silvery legless lizard; the site also provides suitable habitat for giant garter snake. Restoration at this site could enhance habitat for these covered species.

Restoration procedures and guidelines for specific vegetation communities are found in the conservation measures listed in Table 5-18. Restoration actions are covered activities because some of the restoration techniques are expected to have temporary adverse impacts on covered species and may result in take of these species. Mitigation for these impacts is included in the conservation strategy.

Conservation Measure 2.2. Wetland and Pond Enhancement and Management Program

Measure

Wetlands and ponds within HCP/NCCP preserves will be managed to increase hydrogeomorphic and ecological functions, improve habitat value, and enhance the habitats' ability to support existing and new populations of covered species (see Conservation Measures 2.9 and 2.10 for measures related to streams and riparian woodland/scrub). Conservation measures in the wetland enhancement program will be applied to all wetlands within the preserves. Conservation measures to be applied will depend on the type, location, extent, and condition of the wetlands as determined by the wetland delineation conducted in accordance with Conservation Measures set forth in Chapter 6, *Conditions on Covered Activities*. The watershed position and hydrologic context of a particular wetland or pond (e.g., upland spring, valley bottom floodplain, gravel-bed stream) is an important discriminator in determining the extent and scale of appropriate conservation measures. Wetlands within preserves will also be surveyed to determine whether they support covered aquatic or amphibian species or have the potential to support these species. In addition, stockponds will be assessed to determine if they maintain water in typical rainfall years for periods sufficient to support aquatic life stages of California tiger salamander and California red-legged frog.

The techniques listed below may be employed to enhance and manage wetlands; however, this is not an exhaustive list.

- Where appropriate, minimize grazing pressure to reduce trampling of vegetation, soil compaction, development of “cow contours,” and stream bank destabilization. Such impacts are historically documented through the interior valleys and hillslopes of the Coast Ranges, and have led to increased runoff, elevated sediment loads, and severe channel incision).
- Introduce grazing to some areas to reduce cover of exotic plants when such a technique is consistent with maintaining values for covered species. Grazing rotation can also reduce the erosive impacts described above.
- Install fencing around sensitive wetlands and upland buffers to permanently or temporarily exclude livestock and feral pigs.
- Where exotic fish and bullfrogs are present, stockponds and other wetlands can be drained (in concert with summer dry-season cycles) and subsoil removed or sterilized to eliminate these species and improve the wetland or pond’s long-term suitability for covered aquatic species and amphibians. This procedure will also kill native amphibians aestivating in the pond, but they will quickly recolonize the pond from adjacent uplands and nearby ponds once exotic species are removed.
- Repairs will be made to improve pond retention in stockponds that are not functioning properly or not retaining water due to leaks; additionally, stockpond capacity and water duration can be increased (e.g., by raising spillway elevations or adding a pond lining) to support salamander and frog populations.
- Remove invasive exotic species.
- Where severely incised streams are degraded (resulting in erosion and high sediment loads, floodplain disconnection, bank destabilization, or groundwater subsidence), geomorphically appropriate check dams can be placed to stabilize the channel’s longitudinal profile, reduce erosive flow velocities, arrest further channel incision, and encourage in-channel sediment storage.
- Where artificial fill, debris, or other structures have been deposited/built in channels, floodplains, or other wetland flow pathways, these materials can be removed to enhance wetland areas and improve hydrologic functioning.
- Culverts will be evaluated in terms of their operation/function and hydrologic/erosive impacts; poorly functioning culverts or culverts that block native fish passage will be repaired, retrofit, or stabilized.
- In conjunction with controlling exotic plants in permanent marshes and ponds, native emergent vegetation can be planted to improve habitat values for some covered species (e.g., provide substrate for amphibian egg attachment, cover for amphibian larvae, roost and nest sites for tricolored blackbirds where the wetlands are located near foraging habitat). Enhancement of these habitats must be balanced with the need to minimize mosquito production (see below).

Many of these techniques are described in detail in the program designed for similar enhancement measures in the Los Vaqueros Watershed (Jones & Stokes Associates 1993b).

The wetland enhancement program will be developed and implemented in coordination with the Contra Costa Mosquito and Vector Control District (CCMVCD) to ensure that enhanced wetlands do not substantially increase mosquito populations in the preserves and threaten human health. CCMVCD staff will have reasonable access to all wetland sites of concern to monitor mosquito populations and control these populations if warranted. Before applying control techniques within the HCP/NCCP Preserve System, CCMVCD, the Implementing Entity, CDFG, and USFWS will agree to acceptable treatments (i.e., techniques, application rates, timing of application). Control techniques currently used by CCMVCD include biological control (adding fish such as Sacramento perch, mosquitofish [*Gambusia* sp.], or others); water management; vegetation management; and chemical application (Malamud-Roam pers. comm.). The period of concern for mosquito production (primarily *Culex torsalis*) in the inventory area is mid-July through late September or October, depending on the start of the rainy season. Seasonal wetlands that dry prior to this period (e.g., vernal pools, small ponds) are not a concern for mosquito production.

Once wetlands restored or created under Conservation Measure 2.3 reach their success criteria, they will be brought under the wetland enhancement and management program. Wetland enhancement activities may have temporary adverse effects on vegetation communities or covered species. These effects are included in the estimates of vegetation community impact and take of covered species described in Chapter 4.

Rationale

Wetland delineations will be required in all impact areas in order to quantify the impacts on jurisdictional wetlands. Similarly, wetland delineations are required within all preserves in order to demonstrate that the compensation requirements of the HCP/NCCP, as well as those of the Regional General Permit that will be developed from it, are being met.

Wetland enhancement measures must be designed for specific wetland types (hydrogeomorphic context) and, in some cases, for specific sites. As described below, the success of various techniques depends on the wetland type and the site conditions under which they are applied. Wetlands that are highly degraded may require more intensive management. Wetlands already in good condition (e.g., that support populations of covered species) may require little or no enhancement measures.

Fencing wetlands on Los Vaqueros Watershed lands has been shown to be a rapid, successful, and cost-effective method of enhancing some wetlands. After fencing, vegetation cover and wetland species diversity can increase substantially in stockpounds and other permanent or near-permanent freshwater wetlands that have been degraded by cattle grazing (Contra Costa Water District 2002). In this

HCP/NCCP, fencing locations and specifications will depend on several factors, including site-specific conditions and the biological objectives that are being addressed. For example, fencing wetlands may not be appropriate in some locations, because promoting dense riparian vegetation may adversely affect some aquatic species, such as California tiger salamander (Bobzien pers. comm.).

In studies at Los Vaqueros, livestock exclosures were found to benefit seasonal alkali wetlands in the short term. After 1 year, the relative cover, species richness, and species diversity of native target plants was greater in exclosures than immediately outside them (Jones & Stokes 1992b). The positive trend, however, was not statistically significant, suggesting that improvements in this vegetation community will be gradual and that further research is necessary.

Factors that may have contributed to the decline of seasonal wetlands in the Kellogg Creek watershed include hydrologic changes that led to channel incision, changes in channel runoff, hydrologic disconnection of channel and floodplain, lowering of groundwater, and reduction of soil moisture in riparian areas (Jones & Stokes Associates 1992b).

A variety of methods/approaches are available to arrest channel incision. Grazing management and fencing can be used to curtail negative hydrologic effects. Stream bed and bank stabilization is aided by biorestation techniques including live vegetation, brush-matting, vegetated soil lifts, root wad structures, and other techniques that can be used in combination with grade control structures. Installation of appropriately sized and placed check dams to manage channel grade, reduction of channel slope and flow velocities, and fostering of in-channel deposition. Such check dams have been shown to be effective at arresting stream channel erosion in seasonal alkali wetlands in the Los Vaqueros Watershed within 6 months of dam installation (Jones & Stokes Associates 1992b). Over time, such small dams may also increase the recharge of the local aquifer, raising the water table and increasing soil moisture levels near the surface. This effect could, in turn, increase the cover and extent of seasonal wetland vegetation along stream channels.

Conservation Measure 2.3. Wetland Restoration and Pond Creation Program

In addition to the avoidance and minimization measures discussed in Chapter 6 and the enhancement approaches of Conservation Measure 2.2, the Implementing Entity will restore wetlands and create ponds in HCP/NCCP preserves according to the requirements in Tables 5-16 and 5-17. Compensation for impacts on wetlands or ponds will be accomplished through restoration of wetland land-cover types at ratios of either 1:1 or 2:1, as well as through creation of ponds at a ratio of 1:1 (Tables 5-16 and 5-17). The Implementing Entity will also restore or create wetland and pond land-cover types to contribute to the recovery of California red-legged frog, California tiger salamander, western pond turtle, tricolored blackbird, and covered vernal pool invertebrates. The overall goals of the wetland restoration and pond creation program are listed below.

- Provide a net increase of wetland and pond area, functions, and values in the inventory area. See Appendix K for a detailed discussion of the function and values of aquatic resources in the inventory area by watershed and subwatershed.
- Compensate for the temporal loss of wetland and pond functions with preservation of in-kind wetlands (Conservation Measure 1.1) while wetland restoration or creation projects are implemented and restored wetlands are developing their full functions. Note that applicants for coverage under the HCP/NCCP who fill federal or state jurisdictional waters will require separate permits from USACE, RWQCB, or CDFG for authorization to fill those waters. These agencies may require additional mitigation for these permits, although it is the intent of the HCP/NCCP to incorporate any foreseeable requirements of these agencies to avoid the need for additional mitigation.
- Ensure no net loss of stream channel functions and values that are likely considered jurisdictional waters by USACE, RWQCB, or CDFG and regulated under Sections 404 and 401 of the CWA or Section 1602 of the California Fish and Game Code.
- Implement in-kind restoration of wetlands and ponds in preserves where technically and financially feasible and where restoration would avoid significant effects on existing biological resources.
- Where in-kind restoration is not technically or financially feasible as determined by the Implementing Entity in consultation with the U.S. Army Corps of Engineers, wetland restoration will be achieved out-of-kind using a system of wetland functional units to ensure that functions of restored wetlands are greater than the functions of wetlands lost (Jones & Stokes Associates 1993b, 1994).
- Potential restoration sites will be identified and selected on the basis of their governing physical processes and hydrologic, geomorphic, and soil conditions to ensure that successful restoration can occur and be self-sustaining. Such an approach increases the likelihood of successful restoration and reduces long-term management and maintenance costs.
- Restoration sites will also be selected based on their ability to support covered species, support implementation of species-specific conservation measures, and meet species-specific biological goals and objectives. For example, sites designed to support tricolored blackbird should be located a sufficient distance from black-crowned night-heron rookeries to minimize predation on tricolored blackbird (see Conservation Measure 3.2). Sites designed to support breeding habitat for covered amphibians must have adequate upland habitat for aestivation nearby. Restoration sites for aquatic land cover types must meet minimum distances from dense urban development (Table 5-6) to receive credit under this Plan.
- All wetlands and ponds restored or created will be designed to support covered aquatic or amphibian species when physical and biological conditions allow.

- When feasible, reduce mosquito production by designing wetlands to minimize suitable habitat for *Culex torsalis* and other human disease vectors. Provide reasonable access for CCMVCD staff to monitor and control mosquitos at wetland sites when warranted and consistent with an agreement between the Implementing Entity and CCMVCD.
- Wetlands and ponds restored or created will support wildlife habitat of equal or greater function than the habitat lost to covered activities.

Restoration/creation principles and rationales for each aquatic land-cover type are described below.

Alkali wetlands. The Implementing Entity will restore alkali wetlands at a ratio of 2:1 (estimated to be 64 acres of compensation for alkali wetland complexes³ with the maximum urban development area) and restore an additional 5 acres of alkali wetland, including alkali meadows and alkali marshes, to contribute to species recovery (Table 5-17) (Jones & Stokes Associates 1989). Restoration will occur on suitable alkaline soils that have been degraded by disturbances such as overgrazing or cultivation and that previously supported wetlands. Historic photos and other historic records will be used to determine the former extent and type of alkali wetlands present on potential sites. A key requirement for alkali wetlands is the seasonal delivery of surface flows or shallow subsurface flows that support the wetland environment. Structural flow impediments and channel incision have historically altered flow delivery to such wetlands. Restoration programs have been designed for a large alkaline wetland complex in Alameda County and the city of Livermore (H. T. Harvey & Associates 2000; Jones & Stokes 2001) that is similar to those found in the inventory area; these designs, although untested, may be used as models.

Seasonal wetlands. The Implementing Entity will restore seasonal wetlands at a ratio of 2:1 (estimated to be 118 acres⁴ of compensation with the maximum urban development area) and restore an additional 20 acres of seasonal wetlands to contribute to species recovery (Table 5-17). Whenever possible, seasonal wetland restoration will be designed to support one or more covered invertebrates in habitats such as vernal pools. Northern claypan vernal pools are a unique type of seasonal wetland that occurs in unique hydrologic, soil, and geologic conditions that need to be carefully considered for any restoration effort. Restoration of vernal pools must occur within suitable areas that have been severely degraded. Restored vernal pools will be evaluated to determine if covered plants and vernal pool invertebrates are present at frequencies similar to natural vernal pool complexes.

³ Actual acreage of alkali wetland compensation required is expected to be much less than 64 acres because alkali wetland impacts and required compensation will be tracked based on jurisdictional boundaries in the field. This land cover type was mapped at a regional scale using wetland complexes rather than site-specific (and smaller) jurisdictional wetland boundaries.

⁴ Actual acreage of seasonal wetland compensation is expected to be much less than 118 acres because seasonal wetland impacts and compensation will be tracked based on jurisdictional boundaries in the field. This land cover type was mapped at a regional scale using wetland complexes rather than site-specific (and smaller) jurisdictional wetland boundaries.

Ponds. The Implementing Entity will create ponds in preserves at a ratio of 1:1 (estimated to be 8 acres of compensation with the maximum urban development area) and create an additional 8 acres of ponds to contribute to species recovery (Table 5-17). At least 75% of ponds will be created to support breeding habitat for California red-legged frog and/or California tiger salamander, and western pond turtle (ponds that support California red-legged frog may not support California tiger salamander and vice versa) and will be sited away from busy roads to reduce the likelihood of mortality during periods when frogs, turtles, and salamanders move between ponds and uplands. Pond depth will be sufficient to provide suitable breeding habitat for red-legged frogs and/or tiger salamanders and to preclude dense growth of emergent aquatic vegetation. Pond size will vary depending on the availability of water and site and watershed conditions. Also, ponds will be created so that they can be artificially drained if necessary.

In most cases, ponds can be created by installing small check dams along streams. However, this could cause the destruction of valued stream habitat. Identification of potential pond sites should include an appraisal of the existing stream habitat. Existing well-functioning stream habitat should not be used for pond creation, if the construction would lessen the functioning of the stream. Any proposal to discharge fill into waters of the United States would require a CWA Section 404 permit; a streambed alteration agreement with CDFG would also be required. If pond creation is permitted, then the approved sediment management measures must be followed to maintain the pond in the long term. Upstream in-channel measures and small forebays can be used to reduce sediment delivery to the created ponds.

Ponds will be designed so that they either do not retain water long enough to support establishment of bullfrog, nonnative fish, or other predators of California red-legged frog and California tiger salamander, or can be artificially drained to deter such establishment. At the same time, they will be designed to remain ponded for sufficient duration to support successful breeding of California red-legged frog and/or California tiger salamander. Native emergent and aquatic vegetation will be planted in ponds to provide suitable breeding habitat for these covered species.

Perennial wetlands. The Implementing Entity will restore perennial wetlands in preserves at a ratio of 1:1 to replace all functions and values lost to covered activities (estimated to be 75 acres of compensation under the maximum urban development area) and restore an additional 10 acres of perennial wetlands to contribute to species recovery (Table 5-17). Restoration will occur on suitable soils and in areas where perennial wetlands historically occurred and have since been drained or severely degraded. Restoration may include recreating the historic topography of the site and planting native freshwater emergent and aquatic plants. At least 25% of restored perennial wetlands will support breeding habitat for tricolored blackbird and will be sited within flight distance of foraging habitat. Credit will be given toward perennial wetland restoration for perennial wetlands established as a result of the creation of ponds described above (i.e., creation of ponds with emergent wetland vegetation).

Sloughs/Channels. Impacts on sloughs and channels in Zone 6 will be compensated by restoration of slough/channel at a ratio of 1:1, where feasible, or restoration of riparian woodland/scrub in Zone 6 at a ratio of 0.5:1. There are limited opportunities for in-kind compensation of impacts to slough/channel in the HCP/NCCP Preserve System. Restoration of slough/channel to benefit giant garter snake will be considered within the Dutch Slough restoration project (Subzone 6a). If the Implementing Entity acquires land adjacent to Dutch Slough (see Conservation Measure 1.1), slough/channel restoration to benefit giant garter snake could also occur there.

If no opportunities exist for in-kind compensation, it is estimated that the Implementing Entity will restore an additional 37 acres of riparian woodland/scrub with the maximum urban development area in existing streams and channels that historically supported riparian woodland/scrub vegetation (in addition to riparian vegetation restored to compensate for losses of riparian habitat) (Table 5-17). Lost sloughs or channels may be difficult to recreate because of the constraints of existing agricultural operations in Zone 6 and the difficulty of creating the topographic and hydrologic conditions to support them. By replacing lost sloughs and channels with riparian woodland/scrub, there will be a net increase in high-quality habitat for covered species and biological diversity. Any sloughs or channels supporting giant garter snake will be addressed in accordance with Conservation Measure 3.6.

Open Water. Impacts on open water will be compensated by the creation of additional ponds to support breeding habitat for California red-legged frog, California tiger salamander, western pond turtle, and tricolored blackbird. Restoration or creation of large bodies of open water is not required because this land-cover type provides limited values to wildlife. Under the maximum urban development area, it is estimated that the Implementing Entity will create 9 acres of additional ponds.

Wetland restoration or pond creation will be accomplished using the techniques outlined in this measures and that are described in detail in the conceptual wetland restoration program being implemented for the Los Vaqueros Reservoir project (Jones & Stokes Associates 1993b, 1994; Contra Costa Water District 2001a, 2001b). All wetland types found in the inventory area are also found in the Los Vaqueros Watershed and are included in that mitigation program.

Conservation Measure 2.9. Stream and Riparian Woodland/Scrub Enhancement Program

Measure

All degraded streams and riparian woodland/scrub within the preserves will be improved to increase overall ecological functions and values (i.e., species richness and diversity, vegetative cover, wildlife habitat function) and to enhance

the ability of these habitats to support existing and new populations of covered species.

The Implementing Entity will map riparian corridors within the preserves to identify stream segments suitable for enhancement measures. Potential enhancement sites will be evaluated and measures identified in coordination with the other local agencies or organizations active in riparian restoration in the inventory area (e.g., Contra Costa County Resource Conservation District, Contra Costa County Watershed Forum). Detailed measures will be developed for individual sites or stream reaches based on specific geomorphic, hydraulic, and hydrologic conditions; extent and quality of existing habitats (e.g., percent native vegetation and presence/absence of exotic wildlife such as bullfrogs or cowbirds); existing wildlife use; and the potential for adverse effects (e.g., disturbance and/or removal of existing wetland habitat). These measures will include descriptions of plant material requirements (e.g., collected and propagated from local sources); planting and construction methods; and adaptive management and monitoring requirements including indicators and success criteria.

Techniques that could be used to enhance streams and riparian woodland/scrub include but are not limited to those listed below.

- Installing livestock exclusion fencing along designated stream segments and providing alternative water supplies for livestock.
- Hand or mechanical removal of invasive nonnative plant species (e.g., *Arundo donax*).
- Installing biotechnical bank stabilization structures to arrest bank erosion and provide opportunities for planting native riparian woodland/scrub vegetation.
- Planting appropriate native riparian woodland/scrub vegetation in gaps in existing riparian corridors using locally collected material, as determined by the Implementing Entity land managers (planting in gaps larger than one tree canopy length is considered riparian restoration; see Conservation Measure 2.10).
- Planting riparian woodland/scrub vegetation along stream banks to expand existing riparian vegetation.
- Installing willow cuttings along the edge of the low-flow channel to increase overhead cover where it is lacking.
- Using nursery-grown plant material that is free of invasive exotic pests such as Argentine ants.
- Planting riparian woodland/scrub understory species in existing riparian corridors in areas where the understory has been denuded.
- Removing non-vegetative debris such as trash, garbage, or dumped fill material (e.g., concrete, asphalt) from the stream channel to facilitate stream flow.

- Removing and/or modifying barriers (e.g., culverts, low-flow crossings, diversion structures) to up- and downstream fish migration as long as nonnative species (e.g., bullfrogs, exotic fish) do not benefit.
- Where appropriate, installing instream woody material, boulders, or rock structures (e.g., cross or V weirs) to create pools and/or narrow the low-flow channel.
- Where possible, reestablishing the natural disturbance regime (e.g., flooding, sediment deposition and scour) to facilitate natural regeneration of riparian woodland/scrub and promote habitat diversity (Mount 1995).

Riparian enhancement measures will be integrated into the preserve management plans (see Conservation Measure 1.2).

Rationale

Covered species that will benefit from the riparian enhancement program include California red-legged frog, California tiger salamander, foothill yellow-legged frog, and Swainson's hawk. The program will also benefit other wildlife, including raptors, migratory and resident songbirds, and native insects (Warner and Hendrix 1984; National Research Council 2002).

Riparian areas can be impacted by uncontrolled livestock access. Invasive exotics can outcompete native plant species and decrease overall species diversity. Therefore exclosures and riparian plantings are two measures that will contribute to stream and riparian enhancement. Planting riparian woodland and scrub vegetation where it will have a high likelihood of success within existing riparian corridors will increase the width, length, connectivity, and overall species diversity of existing habitat patches.

Installing bank stabilization structures in areas of actively eroding stream banks reduces sediment input and downstream sediment transport/deposition, and reduces adverse effects on instream habitat and water quality. In limited cases, installing instream structures will create pools and overhead cover, increase inputs of organic material, and enhance aquatic habitat for covered species. Removing barriers and/or constructing passage structures will facilitate up- and downstream migration of fish and enhance habitat for covered aquatic species as long as exotic invasive species such as bullfrogs and exotic fish are controlled.

Conservation Measure 2.10. Stream and Riparian Woodland/Scrub Restoration Program

The Implementing Entity will restore riparian woodland and scrub habitats within preserves according to the ratios listed in Tables 5-16 and 5-17 for the initial and maximum urban development areas, respectively. Impacts on riparian woodland/scrub will be compensated through the restoration riparian woodland/scrub habitat types at a ratio of 1:1. The Implementing Entity will also restore 20 acres of riparian woodland/scrub to enhance overall native biological diversity and to contribute to the recovery of covered species. All or most

impacts on slough/channel are expected to be mitigated through restoration of up to 37 acres of additional riparian woodland/scrub (see Conservation Measure 2.3).

Potential impacts on streams will be avoided and/or minimized through implementation of Conservation Measures 1.7 and 2.12 (Chapter 6). Where impacts on streams are unavoidable, mitigation will focus on restoration of streams within preserves. Where mitigation within preserves is infeasible, stream restoration within existing protected areas is allowed. Impacts on streams without riparian woodland/scrub cover can be compensated through either restoration of riparian woodland/scrub vegetation on existing streams or restoration of seasonal or permanent wetlands on an acre-for-acre basis to replace some stream functions (see Conservation Measure 2.3). Impacts on streams with riparian woodland/scrub vegetation will be compensated at a ratio of 1:1 through a combination of stream restoration and restoration of riparian woodland/scrub vegetation. Stream restoration will be accomplished in kind where possible (i.e., impacts on perennial streams will be mitigated through restoration of perennial streams). Restoration principles and rationales for the stream types that occur in the inventory area are described below.

Perennial Streams. Restoration will occur along perennial streams that have been degraded by past land use activities and that historically supported riparian woodland/scrub vegetation. Restoration of perennial streams will likely focus on the implementation of intensive measures such as excavating stream banks and floodplain surfaces because of the ecological benefits to covered species associated with permanent water. Combined with restoration of riparian woodland/scrub, implementation of these activities will provide shade and cover, reduce water temperatures, increase channel complexity, and enhance instream aquatic habitat for fish and other aquatic organisms.

Intermittent Streams. Compensation for the loss of intermittent streams can be accomplished through restoration of intermittent or perennial streams. Restoration will occur along intermittent streams that have been degraded by past land use activities and that historically supported riparian woodland/scrub vegetation. Restoration of intermittent streams will likely involve measures similar to those implemented for perennial streams (e.g., stream bank and floodplain excavation, planting).

Ephemeral Streams. Restoration along ephemeral streams will primarily focus on planting upper terrace riparian species (e.g., oaks, California bay, California buckeye) that can tolerate drier site conditions. However, because there is some evidence that California red-legged frog may be adversely affected by California bay (Bobzien pers. comm.), this riparian species will be used sparingly. If the restoration of ephemeral streams is not feasible because of site conditions or other considerations, the Implementing Entity will be required to restore riparian woodland/scrub or seasonal or permanent wetland habitats on an acre-for-acre basis to replace lost stream functions.

Potential restoration sites in the inventory area (e.g., Robins and Cain 2002; Walking et al. 2002) will be evaluated and measures identified in coordination with the other local agencies or organizations active in riparian restoration in the inventory area (e.g., Contra Costa County Resource Conservation District, Contra Costa County Watershed Forum). As described in Conservation Measure 2.1, the Implementing Entity will likely be conducting most riparian restoration along Marsh Creek, Kellogg Creek, and in and adjacent to Dutch Slough (Figure 5-2 and 5-3). Restoration sites will be selected on the basis of factors including but not limited to those listed below.

- The potential success of restoration activities, based on site-specific conditions (e.g., hydrology, soils).
- The ability of the site to support covered species after restoration.
- The proximity of the site to the area in which streams or riparian woodland/scrub were lost to covered activities.
- The proximity of the site to other intact riparian corridors that support, or are likely to support, covered species.
- The ability of the restored stream and/or riparian woodland/scrub to contribute to regional conservation goals of habitat connectivity.

Detailed restoration plans, including plans and specifications, will be developed for individual sites or stream reaches based on specific geomorphic, hydraulic, and hydrologic conditions; extent and quality of existing habitats; existing wildlife use; and the potential for adverse effects (e.g., disturbance and/or removal of existing habitat or wetlands). Restoration plans will include the following key components.

- Defining restoration goals and objectives, performance indicators, and success criteria.
- Collecting and analyzing baseline data (e.g., soil type and suitability for riparian planting, low-flow conditions, past land use history/alterations).
- Identifying suitable/feasible restoration measures.
- Developing conceptual restoration designs.
- Developing detailed restoration designs (plans and specifications) that identify and describe construction methods, planting areas and methods, planting species (including collection and propagation methods), and maintenance requirements.
- Preparing an adaptive management and monitoring plan that includes descriptions of responsible parties; monitoring methods and schedule; indicators (e.g., vegetative cover); success criteria (e.g., 20% cover by year 5); and adaptive management measures (e.g., replanting with different species).

Conservation measures that could be implemented to restore streams and riparian woodland/scrub include but are not limited to those listed below (U.S. Department of Agriculture 1999).

- Replacing existing hardscape bank protection structures (e.g., riprap, concrete, sakrete) with biotechnical bank stabilization structures, consistent with flood protection purposes.
- Excavating and grading existing stream banks and/or floodplain surfaces to create suitable planting sites for riparian woodland/scrub vegetation, provide opportunities for the deposition of fine-grain materials and native seed stock, and enhance existing flood capacity (if needed to offset the loss of flood capacity from plantings).
- Planting riparian woodland/scrub vegetation in some stream reaches of newly excavated channel banks and floodplain surfaces to increase overhead cover and shaded bank/stream surface, thereby reducing water temperatures to improve aquatic habitat for covered amphibians.
- Planting appropriate native riparian woodland/scrub vegetation within large gaps in riparian corridors (planting in gaps smaller than a typical tree canopy diameter⁵ is considered riparian enhancement; see Conservation Measure 2.9) to increase the width, length, connectivity, and overall species diversity of existing habitat patches.
- Shifting or realigning straightened stream channels to restore meanders (e.g., usually on agricultural lands) and increase instream habitat complexity and quality for covered aquatic species.
- Installing woody material, boulders, and/or instream structures to create pools, reduce the width of the low-flow channel, increase inputs of organic material, and improve habitat for covered aquatic species.

⁵ A typical tree canopy diameter should be used to determine this distance, which will vary depending on the type of habitat and site conditions. Well-developed cottonwood trees may have canopy diameters of up to 30 feet.

Conditions on Covered Activities [Conservation Measures that apply to Wetlands]

Conservation Measure 1.7. Establish Stream Setbacks

Measure

A minimum 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. Where native woody riparian vegetation is present, setbacks will extend at minimum to the outer dripline of this vegetation. Minimum and recommended stream/riparian setbacks will be established for all perennial, intermittent, and ephemeral streams for all covered activities within the ULL. Minimum and recommended stream/riparian 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). For the purpose of stream setbacks, streams will be assigned to one of five categories.

- Concrete channel.
- Perennial or intermittent streams in urban areas.
- Perennial or intermittent streams in agricultural or natural areas.
- Ephemeral streams.
- Marsh Creek and its tributaries.

No setbacks are required on irrigation ditches or underground stream reaches. These categories are designed to correlate with existing habitat quality for species covered by the HCP/NCCP. Stream setbacks are designed to protect existing habitat quality and allow for at least minimal restoration. Digital and hardcopy maps categorizing stream reaches according to this system will be made available to local jurisdictions by the HCPA.

Local jurisdictions will ensure that project proponents seeking coverage under the HCP/NCCP adhere to minimum setback requirements and adopt recommended setbacks, if feasible. Rare exceptions to the minimum requirements will be considered case by case on the basis of factors such as unusual topography or reasonable economic use of a highly constrained site. Technical assistance will be provided by the Implementing Entity, if needed.

Impervious cover within the setbacks is limited to 10% of the setback area to allow for limited development of paved recreational trails, unavoidable road crossings or access roads, and other necessary development. 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. Project proponents are also encouraged to site trails outside the minimum setback to reduce disturbance to wildlife that use adjacent streams and riparian habitats. Exceptions to this requirement will be considered on a case-by-case basis to allow for small, constrained sites or stream setbacks greater than the minimum required (a greater percentage of impervious surface may be allowed for larger stream setbacks).

The minimum stream setbacks proposed by this measure are designed to maintain existing habitat value for covered species, which is generally low within the ULL. 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 program, which is outside the scope of the HCP/NCCP. To achieve creek protection beyond the goals of the HCP/NCCP, local jurisdictions are encouraged to develop other measures.

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

Where practicable, the stream setbacks should exceed the minimum requirements to provide a variable width stream corridor as determined by local jurisdictions; such an enhanced corridor would increase habitat values, water quality protection, and opportunities for recreation. For example, 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 (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.

[Will add info on County stream setback policy in GP (75' setback from creek centerline) and County Ordinance]

Conservation Measure 1.10. Maintain and Improve Hydrologic Conditions and Minimize Erosion

Measure

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). This measure applies to all new development within the permit area covered by the HCP/NCCP. The overall goal of this measure is to ensure that new development permitted under the HCP/NCCP has no or minimal adverse effects on downstream fisheries to avoid take of fish listed under ESA or CESA.

Although the CCCCWP's NPDES permit currently covers only areas under the jurisdiction of the San Francisco RWQCB, this conservation measure extends the provisions to all of East Contra Costa County (i.e., portions within the Central Valley RWQCB)¹. The C.3 Provision contains performance standards to reduce construction and postconstruction impacts of 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.

¹ The Provision C.3 Amendments may be approved by the Central Valley RWQCB before HCP/NCCP permit approval.

- 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, 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 1.13. 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 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 vegetative cover will be reestablished with native species using weed-free materials.
- Repairs to flood control channels will incorporate bioengineering techniques when feasible.
- 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) where feasible.

Rationale

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 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 2.12. Wetland, Pond, and Stream Avoidance and Minimization

Measure

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

- All wetlands, ponds, and streams will be avoided to the maximum extent practicable on site.
- Applicants that preserve streams on site must follow the stream buffer guidelines 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. Credit for preservation of aquatic habitat will be given only if these features meet minimum distances from dense

urban development (see Table 5-6). Buffers for streams and riparian vegetation will follow the minimum requirements in Conservation Measure 1.7.

- 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 legal 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 vehicles will be refueled within 100 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., hay bales, 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. Erosion control measures will be placed between the outer edge of the buffer and the project site.
- Hay bales used for erosion control will be certified as weed free.
- 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 ordinary high water mark of these streams.
- 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.

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 for projects that receive CWA Section 404 permits. 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 generally make it easier to protect, enhance, and restore wetlands.