SECTION 5: SUB-BASIN SCALE PLANNING CONSIDERATIONS

The Planning Considerations identified in this section are intended to be used at the sub-basin scale. The Planning Considerations are separated into two sub-groups: **(1)** those that apply to sub-basins within the San Juan Creek Watershed; and **(2)** those that apply to sub-basins in the San Mateo Creek Watershed. Each sub-basin description includes:

- A summary of the Planning Considerations – Existing Conditions and Biological Resources for each sub-basin. Planning considerations relating to soils and hydrology should be related to the more extensive review set forth in the Watershed Planning Principles.

- A summary of Planning Recommendations for each sub-basin. The Planning Recommendations are broken down into three general categories: protection, management and restoration. Appropriate goals, performance standards and reporting requirements associated with management and restoration recommendations will be developed in the context of specific management and restoration plans that will be prepared in the future. Not all sub-basins have management and/or restoration recommendations.

- Maps illustrating important biological resources, including listed species and other selected planning species.

- Maps identifying areas recommended for both upland and creek restoration, revegetation, and/or enhancement.

With regard to Sub-Basin Scale Planning Considerations and Planning Recommendations for individual "planning species," it is extremely important to review the "Species Accounts" in Section 4 prior to reviewing the sub-basin planning considerations and recommendations. The Species Accounts in Section 4 provide an overview of each planning species and provide a full set of recommendations for each species on an area wide basis. These recommendations are carried forward into the planning considerations and planning recommendations for each sub-basin set forth in this Section 5. Accordingly, the sub-basin planning considerations and planning recommendations for each species derive from the overall Species Accounts and are presented, along with other sub-basin planning considerations and recommendations, to provide a complete picture of all of the planning species considerations and recommendations for a particular sub-basin. Since the April 2003 version of the Guidelines was released new plant species information has been incorporated into the May 2004 version, most importantly for the thread-leaved brodiaea and the many-stemmed dudleya. The reader is referred to the Species Accounts in Section 4 for more detail on these important updates. Additions and revisions are

incorporated into this Section 5 based on the new information. As noted in Sections 1 and 4, the revisions to the Species Accounts in this document have not been commented upon by the resource agencies.

Species recommendations are presented for planning purposes to assist in selecting and evaluating Habitat Reserve design alternatives and the preliminary and draft Conservation Strategy. Specific mitigation requirements for individual species, including performance standards, will be prepared in conjunction with subsequent determinations regarding those species that will be proposed for regulatory coverage upon final approval of the Southern Subregion NCCP/HCP.

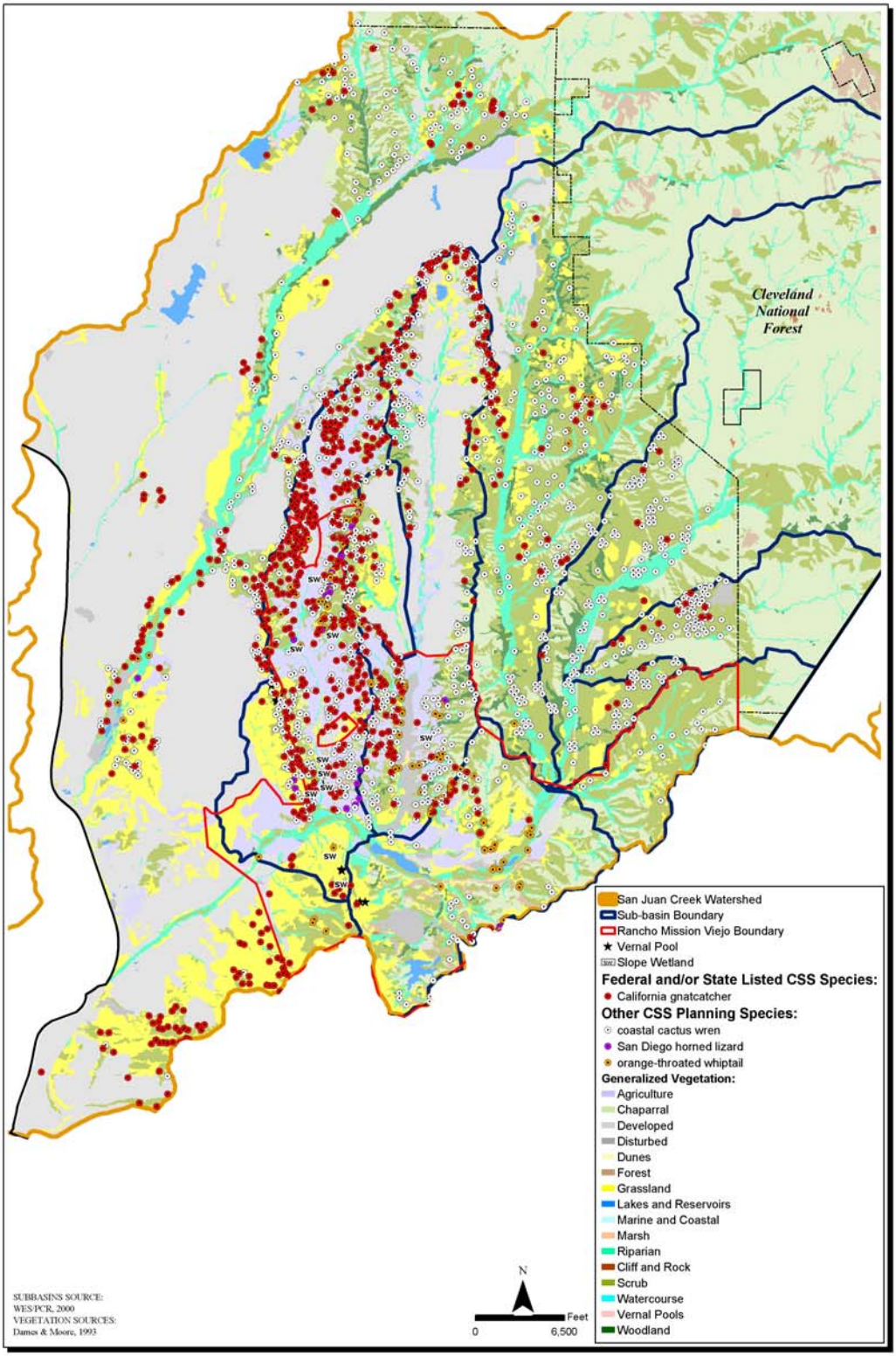
Finally, it should be noted that management and restoration recommendations will continue to be amplified as further information is obtained (e.g., a recent report on invasive plants species and other draft reports are under review) and as draft management plans are completed (e.g., a Grazing Management Plan will identify both transitional and long-term grazing areas and practices and a Fire Management Plan will address fuel modification standards, fire suppression practices and strategies and prescribed burns for habitat restoration and long-term management).

5.1 San Juan Creek Watershed

Figures 5-1 through *5-5* provide planning species maps for coastal sage scrub, riparian/aquatic habitat, historic raptor nest sites, grassland, and plants, respectively, for the San Juan Creek Watershed.

5.1.1 Chiquita Canyon Sub-basin

The Chiquita Canyon sub-basin is divided into three geographic areas: upper Chiquita Canyon, defined as the portion of the sub-basin north of Oso Parkway, middle Chiquita, defined as the portion of the sub-basin south of Oso Parkway to the "Narrows" and lower Chiquita Canyon defined as the portion of the sub-basin from the "Narrows" to the sub-basin boundary south of San Juan Creek and Ortega Highway. Upper Chiquita Canyon is protected by a conservation easement. Middle and lower Chiquita Canyon would be subject to the sub-basin planning considerations and recommendations described below. To distinguish the two ridges bordering Chiquita Canyon, this document refers to the east ridge as Chiquadora Ridge and the west ridge as Chiquita Ridge. The eastern portion of Chiquadora Ridge is in the Gobernadora sub-basin.



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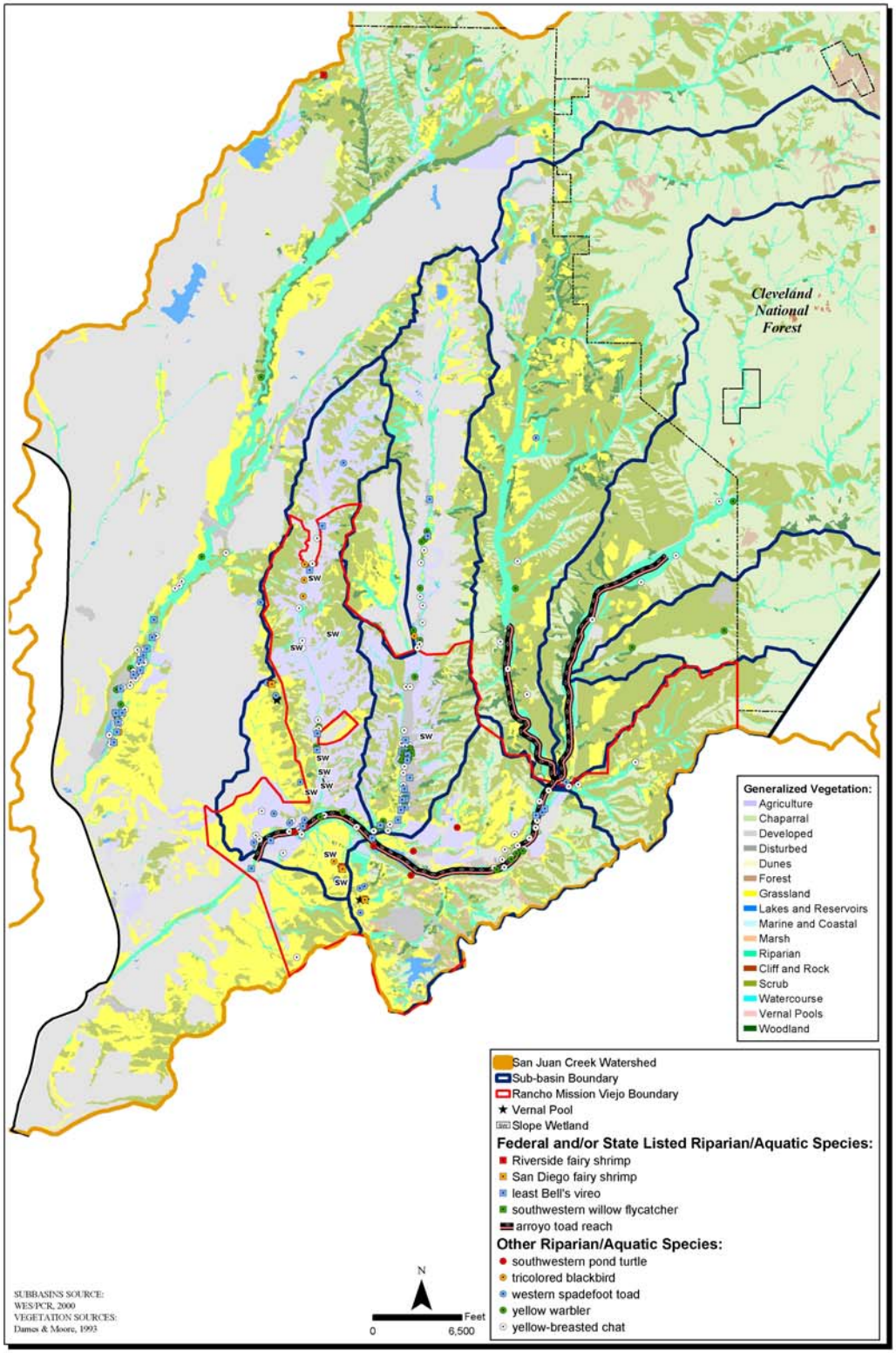
San Juan Creek Watershed - Coastal Sage Scrub Wildlife Species

FIGURE 5-1



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San Juan Creek Watershed - Riparian/Aquatic Wildlife Species

FIGURE 5-2

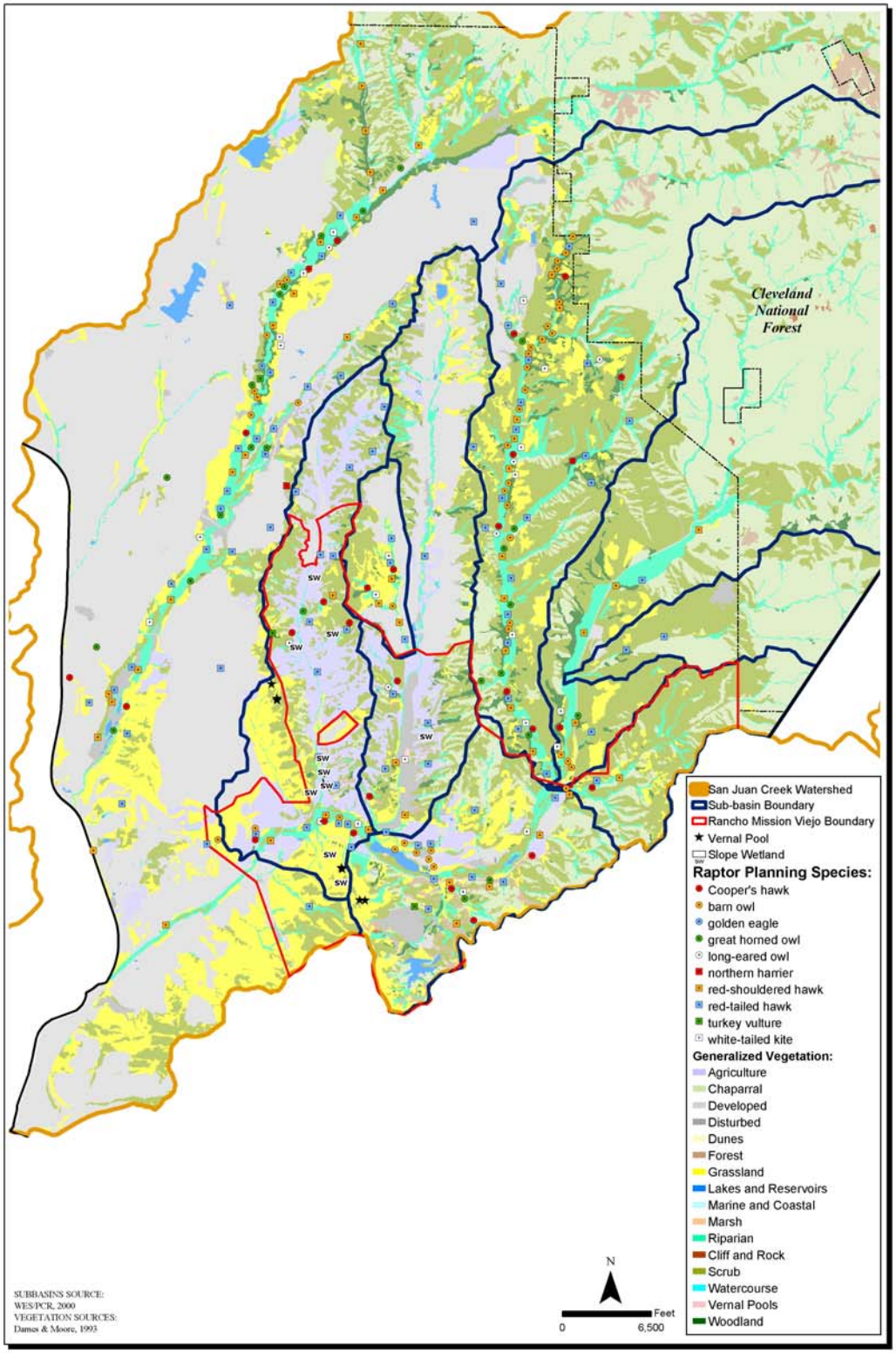

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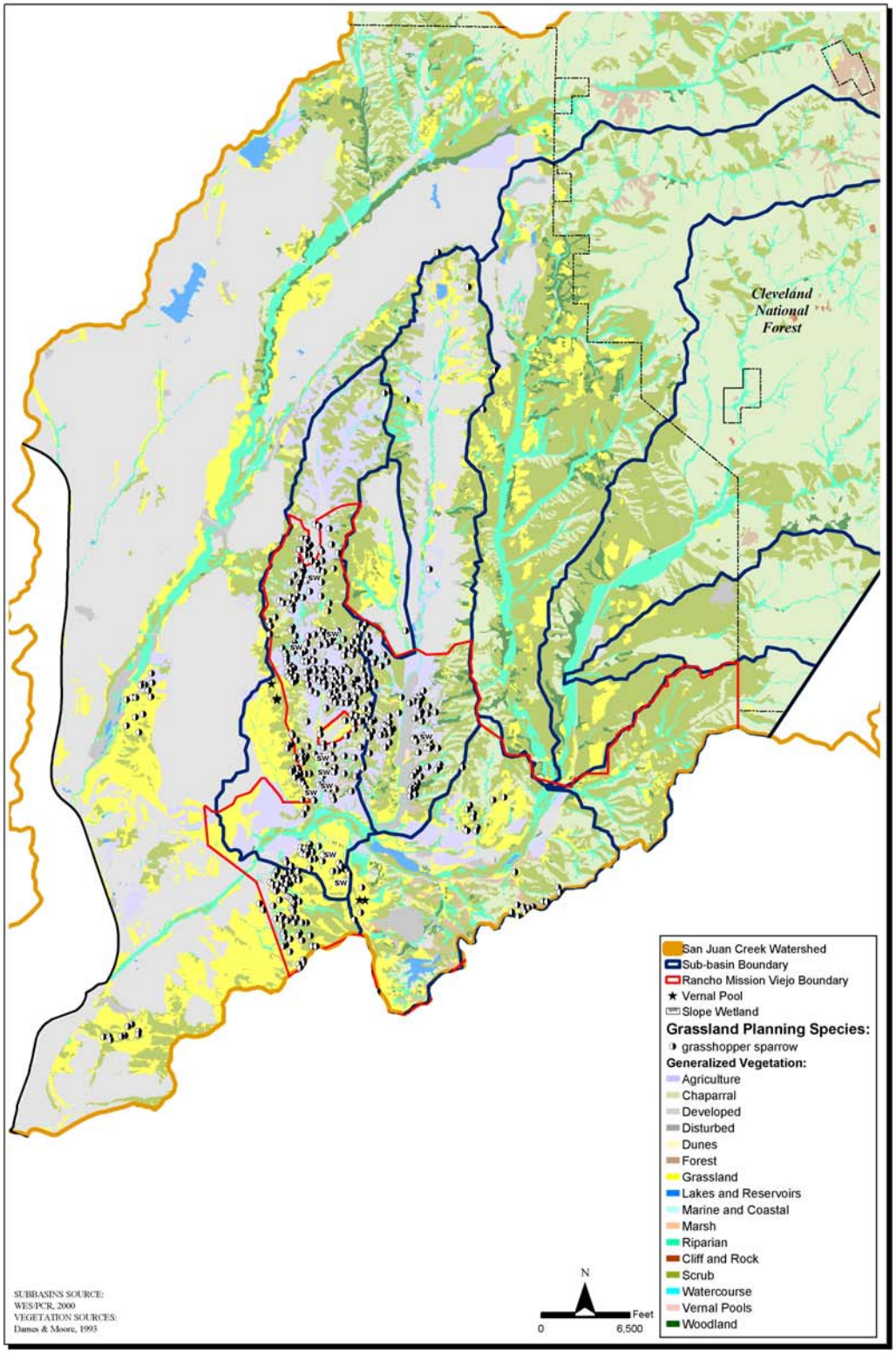
FIGURE 5-3

San Juan Creek Watershed - Historic Raptor Nest Sites



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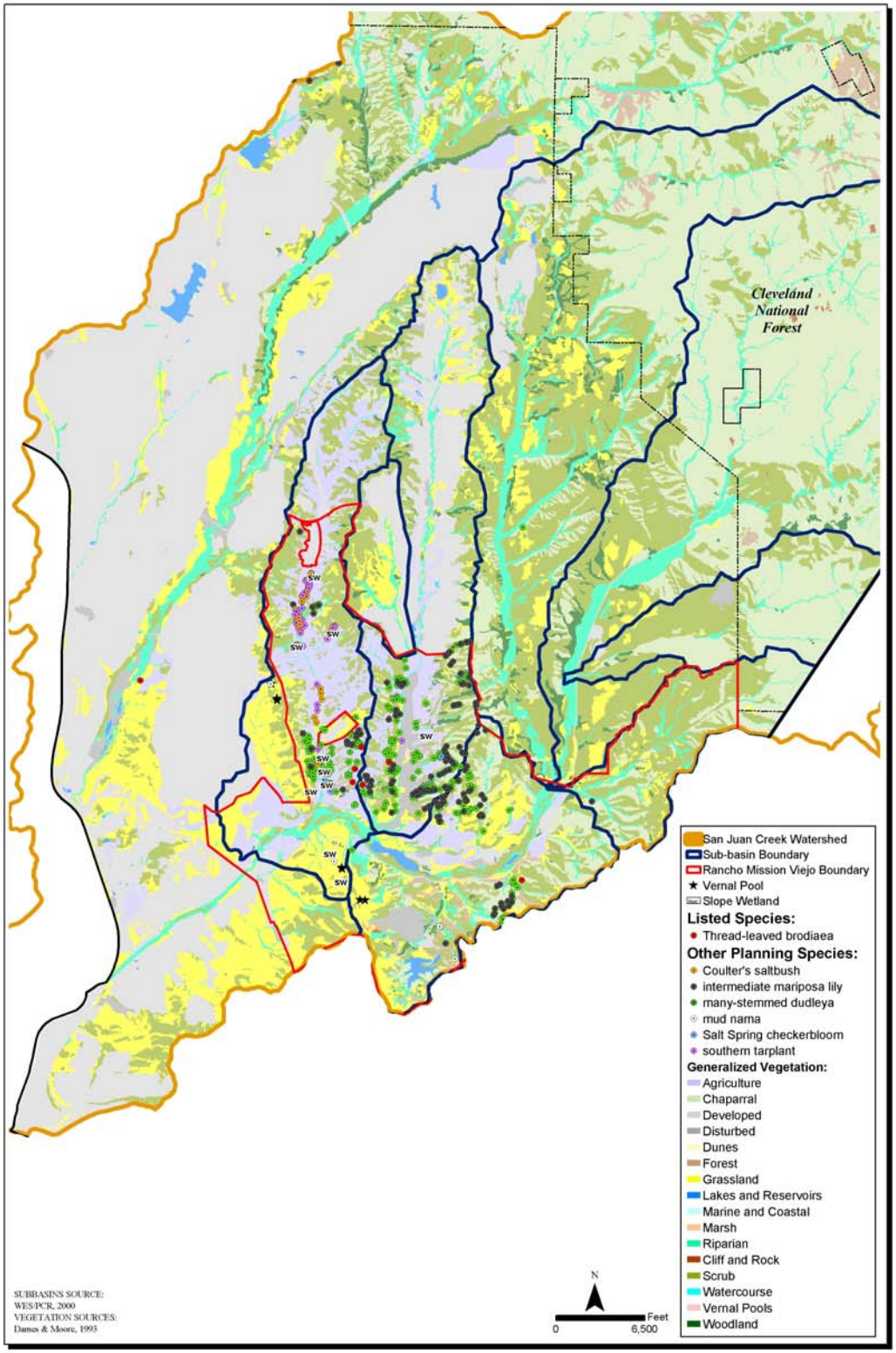
San Juan Creek Watershed - Grassland Wildlife Species

FIGURE 5-4



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San Juan Creek Watershed - Plant Planning Species

FIGURE 5-5

a. Planning Considerations - Existing Conditions and Biological Resources

Note that substantially revised Planning Considerations from the 2003 Version of the Guidelines are shown in boldface.

- Soils in the main canyon and eastern side canyons primarily are sandy. Soils on the western side are primarily silty sand. Ridges on the east side of the valley are characterized by rock outcroppings and areas of clay hardpans that are eroded remnants of claypans.

- Elevations in the sub-basin range from approximately 200 feet above mean sea level at the confluence with San Juan Creek to 1,200 feet in the north end of the sub-basin.

- The sub-basin is approximately 5.7 miles from the Pacific Coast.

Upland habitats mostly are comprised of coastal sage scrub, agriculture, patches of native and annual grassland and patches of chaparral.

- The Chiquita Canyon area north of San Juan Creek, including Chiquadora Ridge and Wagon Wheel Canyon adjacent to the Chiquita sub-basin, supports a *major population* of the California gnatcatcher, both within the Southern Subregion, and within the range of the gnatcatcher in southern California. This area, which extends from the "horseshoe" in northern Coto de Caza south to San Juan Creek, includes 404 mapped locations of the gnatcatcher and accounts for 55 percent of the mapped gnatcatcher locations in the subregion. This is the *major population* in the subregion. A substantial portion of this population is a *key location.*

- The portion of the sub-basin south of San Juan Creek supports 5-6 California gnatcatcher locations in habitat linkage K. This small concentration of gnatcatcher locations, which overlaps with the Trampas Canyon subunit, as described below, is an *important population* in a *key location* because it provides north-south connection for the species.

- The mainstem creek supports herbaceous riparian, southern willow scrub, arroyo willow riparian forest, and coast live oak riparian forest habitats that support the least Bell's vireo and several other sensitive riparian and aquatic species, including yellow-breasted chat, yellow warbler, southwestern pond turtle (near the confluence with San Juan Creek), western spadefoot toad, and two-striped garter snake.

- The portion of San Juan Creek within the Chiquita sub-basin supports the western most extent of the San Juan Creek *major population* of arroyo toad (Bloom [1998] mapped potential habitat to an area about 3,000 feet downstream of Antonio Parkway bridge, but toads have not been observed farther west than about the confluence with Chiquita Creek.) This extension of the San Juan Creek *major population* is not considered a *key location* for at least three reasons: **(1)** the viability of the upstream *key locations* in Upper San Juan Creek and Bell Canyon are not reliant on this small downstream population; **(2)** recent breeding has been limited to an area just downstream of Trampas Canyon supported by an artificial runoff source; and **(3)** the proliferation of arundo in this reach of San Juan Creek is contributing to ongoing degradation of toad habitat.

- In addition to the perennial Chiquita Creek, several slope wetlands are present in lower Chiquita Canyon and the portion of the sub-basin south of San Juan Creek. These wetland features have varying conditions and support saltspring checkerbloom in the two southern most slope wetland locations.

- The riparian and woodland habitats in the mainstem creek and side canyons provide nest sites for several raptor species, including Cooper's hawk, white-tailed kite, red-shouldered hawk, great horned owl and barn owl.

- The sub-basin provides breeding and/or foraging habitat for a variety of the other sensitive wildlife species, including coastal cactus wren, ferruginous hawk, prairie falcon, merlin, northern harrier, wintering burrowing owls, loggerhead shrike, grasshopper sparrow, rufous-crowned sparrow, California horned lark, tricolored blackbird (nomadic colonies), orange-throated whiptail, coastal western whiptail, San Diego horned lizard, northern red-diamond rattlesnake, mule deer and mountain lion.

- A tricolored blackbird breeding colony has been observed on slopes south of San Juan Creek behind an RMV residence in the recent past (300+ pairs in 2001; P. Bloom, pers. comm. 2002).

- Vernal pools along Radio Tower Road south of Ortega Highway appear to be associated with localized bedrock landslides from the San Onofre and Monterey formations and support both the federally-listed Riverside fairy shrimp (vernal pool 2) and San Diego fairy shrimp (vernal pools 1 and 2), and the western spadefoot toad.

- Vernal pools (4 and 6) on Chiquita Ridge support San Diego fairy shrimp. The largest pool (4) also supports Riverside fairy shrimp and mud nama. A third vernal pool (5) was created as mitigation for Antonio Parkway and currently does not support either species of fairy shrimp.

- The state/federally-listed thread-leaved brodiaea is found in five locations on Chiquadora Ridge southeast of the wastewater treatment plant, including the eastern portion of the Chiquita sub-basin and the western portion of the Gobernadora sub-basin. The easternmost population on Chiquadora Ridge has about 2,000 flowering stalks. Together these five locations comprise a *major population*, substantial portions of which are a *key location*.

- The sub-basin, including Chiquadora Ridge, supports four general areas of many-stemmed dudleya (CNPS List 1B):

  - Chiquadora Ridge supports 47 locations numbering about 8,623 individuals and comprises a *major population* in a *key location*.

  - Approximately 18 locations on Chiquita Ridge comprise a total of about 1,349 individuals and are an *important population* in a *key location*. This *important population* includes four locations totaling 100 to 420 individuals each.

  - **Lower Chiquita Canyon east of the creek and south of treatment plant supports 41 locations totaling about 6,686 individuals. This is a *major population* in a *key location*. This population was originally considered an *important population* and potential *key location,* but 2003 survey data showed a four-fold increase in the population size and this location is now considered a *major population* and *key location*.**

  - The ridgeline east of the "Narrows" in middle Chiquita supports four locations of dudleya, with one numbering about 370 individuals and the other three numbering from 46 to 75 individuals. Because these locations are small and isolated from other locations, these individuals are not considered an *important population*.

- The sub-basin, including Chiquadora Ridge, supports four general areas of intermediate mariposa lily (CNPS List 1B) **Note: this section has not been revised to reflect 2003 survey data because of unresolved taxonomic issues with this species in the planning area**:

  - Lower Chiquita Ridge west of the creek supports three locations of intermediate mariposa lily numbering about 21, 47, and 625 individuals. Although these locations do not support large populations, together they may be considered to be an *important population* in a *key location* because Chiquita Ridge is a key landscape feature and habitat linkage in the subregion.

- Lower Chiquita Canyon east of the creek and south of the treatment plant supports about 18 locations, with most uncounted, but one relatively large population of 660 individuals. These scattered locations, along with the location numbering 660 individuals, may be considered an *important population.* Whether this population is also in a *key location* depends of the long-term status of the Chiquita Ridge and Chiquadora Ridge populations.

- Middle Chiquita Canyon supports five scattered locations north of the "Narrows" and both east and west of the creek. The largest of the five locations is west of the creek and has about 260 individuals. Another location west of the creek only supports two individuals and the three locations east of the creek support four, 12, and 70 individuals. Two locations also occur north of Oso Parkway in the Upper Chiquita Conservation Easement, with one location supporting only one individual and the other supporting ten individuals. Because of the few number of locations and the small number of individuals at each site, these locations probably are not *important populations* or in *key locations*.

- Chiquadora Ridge supports about 12 locations totaling about 1,580 individuals. These locations overlap the Chiquita and Gobernadora sub-basins and constitute a *major population* in a *key location.* The Chiquadora Ridge population is important for maintaining the landscape connection between the intermediate mariposa lily population on Chiquita Ridge and the populations in the San Mateo Watershed.

- The sub-basin supports four general locations for southern tarplant (CNPS List 1B):

  - Middle Chiquita supports about 35 mapped locations ranging up to about 30,000 individuals in the largest. Estimated discrete locations numbering 7,000, 7,500, 10,000, 20,000, and 30,000 individuals, respectively, are located west of the creek. Locations east of the creek are more disparate and smaller, with the largest numbering about 750 individuals. These 35 locations comprise a *major population* and the portion of the population west of the creek is a *key location*.

  - The Tesoro High School Mitigation site in Lower Chiquita supported approximately 1,100 individual in 2000, 6,000 individuals in 2001 and 11,000 individuals in 2002 as determined during monitoring of the population. This population was introduced to the site in Fall of 1999 as mitigation for impacts to the tarplant at the High School site. This population appears to be self-sustaining and has increased for three consecutive years and should now be considered a *major population* in a *key location*

- Further south in Lower Chiquita Canyon there is one population numbering about 400 individuals. This population is relatively small for this species, but should be considered functionally part of the Tesoro *major population*.

- A wetland seep between the Gobernadora and Chiquita sub-basins supports a few hundred individuals during optimal years. While not large enough to be considered a major population, this population may potentially be an *important population* in a *key location.*

- The sub-basin supports five general locations of Coulter's saltbush (CNPS List 1B):

  - Lower Chiquita Canyon west of the creek supports two locations numbering 200 and 400 individuals, respectively. These two locations are an *important population* and comprise a *key location* because of the rarity of the species in the region.

  - Middle Chiquita just above and below the "Narrows" supports numerous locations ranging from the 10s to 600 individuals. The location with 600 individuals is east and adjacent to the creek about midway between the "Narrows" and Tesoro High School. Locations with 150, 150 and 200 individuals are west of the creek. These locations overlap substantially with the largest southern tarplant population. This group of locations east and west of the creek is a *major population* in a *key location.*

  - Middle Chiquita just to the northwest of the treatment plant supports five locations, of which four are west of the creek. The locations west of the creek number 25, 50, 150 and 360 individuals and the location east of the creek has 100 individuals. These five locations constitute an *important population.* The locations west of the creek constitute a *key location*.

  - Two small locations are located in a major side canyon southeast of the Narrows. These locations number six and 10 individuals, respectively.

  - One small population of less than 20 individuals occurs with southern tarplant (noted above) at a wetland seep between the Gobernadora and Chiquita sub-basins.

- Salt Spring checkerbloom (CNPS List 1B) occurs in the two slope wetlands in lower Chiquita Canyon. These are *important populations* in *key locations* because at 1,200 and 300 individuals, respectively, they are by far the two largest of three locations known

from the subregion. The third location in the Gobernadora sub-basin supported only three individuals in 2003.

- The sub-basin also supports populations of Palmer's grapplinghook (CNPS List 4) and Catalina mariposa lily (CNPS List 4). The grapplinghook occurs in approximately 35 scattered locations (no population estimates) on Chiquadora Ridge southeast of the wastewater treatment plant and at a location supporting about 300 individuals east of the "Narrows." The Catalina mariposa lily is more widely distributed in the sub-basin, with clusters of individuals on Chiquadora Ridge southeast of the wastewater treatment plant, on Chiquita Ridge west of the "Narrows" and on a ridgeline east of the "Narrows."

- The sub-basin provides both north-south and east-west movement opportunities for mountain lion, mule deer, bobcat, coyote and gray fox. Coastal sage scrub habitat along Chiquita Ridge provides north-south movement opportunities for California gnatcatchers, cactus wrens, and other sensitive sage scrub species. A known important east-west movement route includes a wildlife corridor from Arroyo Trabuco situated between the Ladera Ranch and Las Flores developments. Based on existing landscape features, potential habitat linkages from Chiquita Ridge to Sulphur Canyon are located just north of the wastewater treatment plant and through the "Narrows" area south of Tesoro High School.

b. Planning Recommendations

1. Protection Recommendations

Note that one new Protection Recommendation is shown in boldface.

- Protect the major north-south connection to Central San Juan Creek by providing a habitat linkage between Chiquita Creek and the eastern edge of the Ladera Open Space and by restricting new impervious surfaces west of Chiquita Creek in order to maintain habitat integrity between the creek and Chiquita Ridge.

- Maintain east-west biological connectivity by protecting habitat linkages and wildlife corridors between Arroyo Trabuco, Chiquita Canyon, and Gobernadora Canyon. Biological connectivity should be maintained between Chiquita, Gobernadora and Arroyo Trabuco by protecting habitat linkages at minimum of three locations within the sub-basin: 1) via rim-to-rim preservation of Sulphur Canyon (approximately 2,000 to 2,500 feet wide); 2) at the "Narrows" where the canyon is only 700-800 feet wide (approximately 3,000 feet south of Tesoro High School) and connects to Sulphur Canyon; and 3) in contiguous patches of coastal sage scrub through the major canyon north and east of the wastewater treatment plant.

- Protect breeding and foraging habitat for the least Bell's vireo within Chiquita Canyon by focusing on protection of riparian habitat in Chiquita Creek.

- Protect breeding habitat and, to the extent feasible, protect foraging habitat for raptors and other species along Chiquita Creek.

- Protect riparian habitat in Chiquita Canyon by recognizing the influences of terrains and hydrology on the Chiquita Creek riparian system (see Watershed and Sub-basin Planning Principles).

- Protect the two vernal pools and their contributing hydrologic sources along Radio Tower Road that support the Riverside fairy shrimp, San Diego fairy shrimp and western spadefoot toad. The vernal pools located on Chiquita Ridge are within the existing protected Ladera Open Space.

- Protect slope wetlands and maintain their primary sub-surface water supply recharge characteristics and, where avoidance is infeasible, minimize and mitigate impacts.

- In conjunction with the large population of 2,000 thread-leaved brodiaea flowering stalks on Chiquadora Ridge in the Gobernadora sub-basin, protect two of the four small locations of thread-leaved brodiaea in Chiquita Canyon. Combined with the large population on Chiquadora Ridge, protection of these *key locations* would contribute to protection of a *major population.*

- **Protect the lower Chiquita Canyon *major population* and *key location,* totaling more than 6,686 individuals in 41 locations. The locations in this population range from 1 to 1,330 individuals, with four locations supporting at least 500 individuals.**

- Protect the Chiquita Ridge *important population* and *key location* of many-stemmed dudleya totaling about 1,349 individuals in approximately 18 discrete locations. This population includes four locations totaling 100 to 420 individuals each.

- Protect approximately six locations of intermediate mariposa lily along Chiquita Ridge together with the location south of the treatment plant that supports 660 individuals, totaling protection of about 1,600 individuals. Although these locations are scattered, together they comprise an *important population* in a *key location*

- Protect the 14 locations of intermediate mariposa lily comprising the major population on Chiquadora Ridge that overlaps the Chiquita and Gobernadora sub-basins, for a total protection of 2,000 individuals.

- Minimize impacts to the *key location* of southern tarplant west of Chiquita Creek in Middle Chiquita Canyon to the maximum extent feasible. Minimize impacts to the remainder of the *major population* in Middle Chiquita Canyon. Mitigate impacts to southern tarplant in a manner similar to the successful Tesoro mitigation project (ongoing mitigation projects in Chiquita Canyon have demonstrated over three successive years that this plant can be readily propagated from seed).

- Protect *major population* of southern tarplant in a *key location* in Lower Chiquita Canyon.

- Protect the *key locations* of Coulter's saltbush in Middle and Lower Chiquita Canyon. Minimize impacts to *important populations* within the sub-basin and mitigate unavoidable impacts in Chiquita Canyon**.**

- Protect the two *key locations* of Salt Spring checkerbloom in the slope wetlands in lower Chiquita Canyon.

- Protect the *important population* of the California gnatcatcher and coastal sage scrub in the portion of the sub-basin south of San Juan Creek to maintain resident and dispersal habitat for the gnatcatcher between Chiquita Ridge and San Juan Capistrano and San Clemente.

- Based on the application of the above connectivity protection recommendations and the Species Accounts recommendations, the goal is to protect at least 80 percent of the existing coastal sage scrub and gnatcatcher locations within the *major population* (including those sites within the Chiquita sub-basin and the Chiquadora Ridge portion of the Gobernadora sub-basin). Additional conservation of gnatcatcher habitat will be achieved by implementation of the restoration recommendations described below and in Section 4.

2. Management Recommendations

- Implement a cowbird trapping program to mitigate for impacts to existing habitat within the sub-basin and for potential impacts associated with future development. The cowbird trapping program will be evaluated on an annual basis and trap locations and trapping effort will be adjusted as part of the overall adaptive management program (*e.g*., if the number of trapped cowbirds drops to a prescribed threshold, the trapping program may be terminated or otherwise modified).

- Implement a management program for protected sensitive plant locations in the sub-basin, including control of non-native invasive species, management of grazing and minimization

of human access and disturbance as part of the adaptive management program,. The adaptive management recommendations for plants are described more fully in Section 4.

3. Restoration Recommendations

- Implement a coastal sage scrub (CSS)/valley needlegrass grassland (VGL) restoration program to enhance habitat connectivity and mitigate for impacts to existing habitat associated with future development (*Figure 5-6*). The CSS/VGL restoration program is discussed more fully in Section 6.

- Translocate salvaged thread-leaved brodiaea and many-stemmed dudleya to CSS/VGL restoration and enhancement areas where feasible and appropriate. Potential restoration and enhancement areas in the sub-basin include Chiquita Ridge and Chiquadora Ridge. Receiver areas should support clay soils suitable for brodiaea and many-stemmed dudleya, and should be placed in locations that maximize connectivity and genetic exchange.

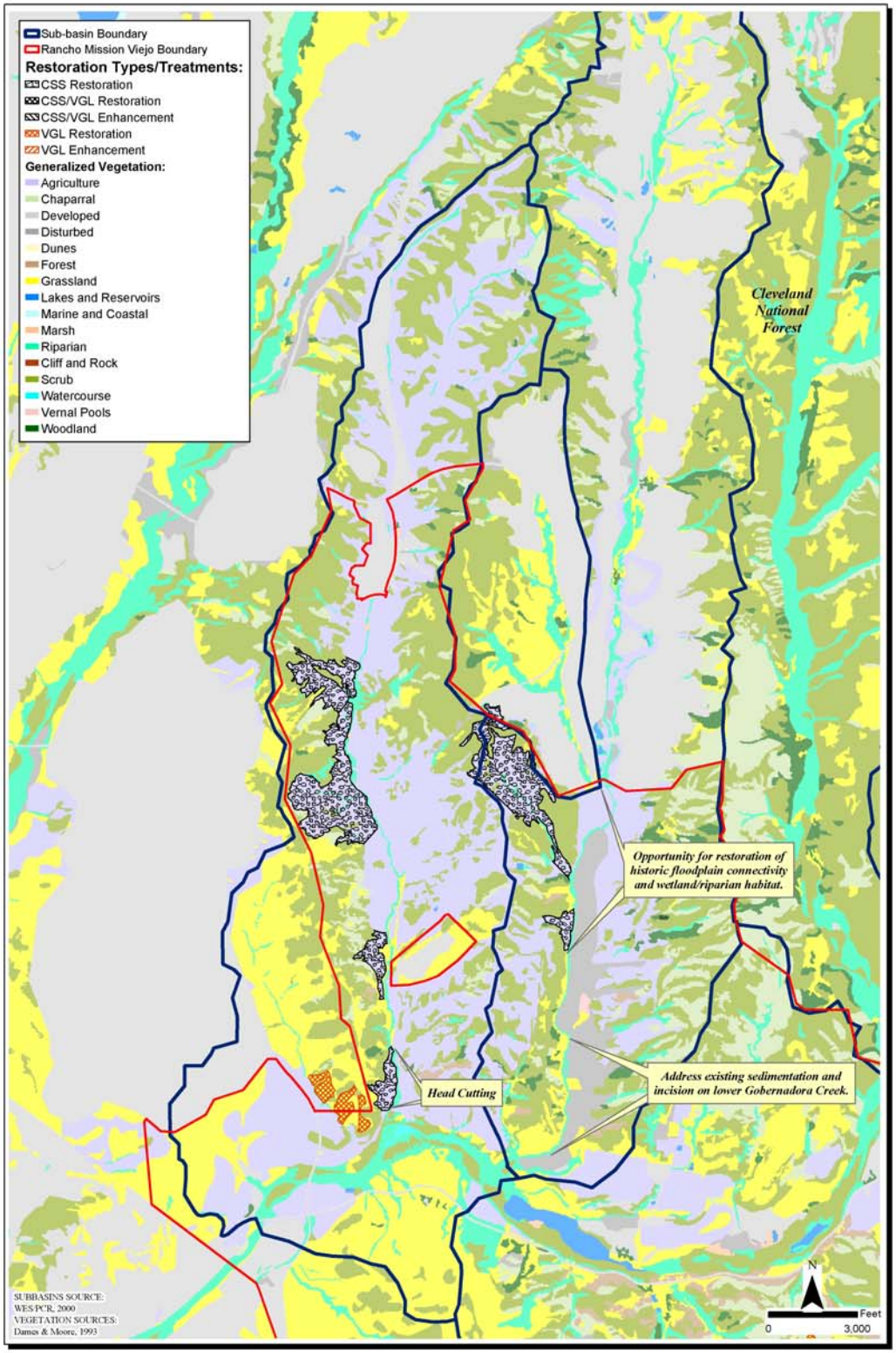
- Salvage clay topsoils from development areas where feasible and appropriate and transport to restoration areas. Salvaged topsoils may be used to create additional suitable brodiaea and dudleya habitat and may contain seedbank.

- Initiate an intermediate mariposa lily seed collection program in 2003 if sufficient rain falls to warrant the collection program. Receiver sites should be identified in the winter of 2003 and a pilot planting program should be implemented to determine the effectiveness of propagation from seed.

- Translocate salvaged intermediate mariposa lily bulbs to areas where suitable soil conditions occur. Specific translocation areas have not been identified, but based on the existing distribution potential general translocation areas in the sub-basin area include Chiquita Ridge and Chiquadora Ridge.

- Translocate salvaged southern tarplant and Coulter's saltbush to suitable restoration and enhancement areas in the sub-basin. Receiver areas should support alkali soils suitable for both species and should be placed in locations that maximize connectivity and genetic exchange.

- Implement restoration efforts to address localized headcuts within the sub-basin as further described in the Watershed and Sub-basin Planning Principles – Chiquita Sub-basin (*Figure 5-6*).



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CSS/VGL and Creek Restoration for Canada Chiquita/Narrow Canyon & Canada Gobernadora Sub-basins

FIGURE 5-6

5.1.2 Gobernadora Canyon Sub-basin

The Gobernadora Canyon sub-basin is divided into two main geographic areas: upper Gobernadora Canyon, which includes the Coto de Caza residential development; and lower Gobernadora Canyon, which is under RMV ownership. The discussion herein is limited to lower Gobernadora Canyon within RMV ownership.

a. Planning Considerations - Existing Conditions and Biological Resources

Note that one new Planning Consideration based on recent information is shown in boldface.

- Soils in the valley floor of the sub-basin are characterized by deep alluvial sandy deposits with interbedded clay lenses. The hill slopes and ridges exhibit areas of exhumed hardpan overlying sandy and silty substrates (the remnants of claypans formed in the geologic past) and also include exposed rock outcrops or other areas of steep slopes.

- Elevations in the sub-basin range from approximately 260 feet above sea level at the confluence with San Juan Creek to 780 feet at the head of Sulphur Canyon west of the main valley.

- The sub-basin is approximately 6.5 miles from the Pacific Coast.

- Uplands are comprised of coastal sage scrub, chaparral, grassland, agriculture, and patches of oak woodlands. The more rugged uplands on the western side of the creek are dominated by coastal sage scrub, grassland and agriculture. The flat to rolling terrain on the east side of the creek supports a mixture of agriculture, coastal sage scrub, chaparral and oak woodlands. Sulphur Canyon, located west of the mainstem creek and below Chiquadora Ridge, is bordered by agriculture (grazing pasture and barley fields) and coastal sage scrub.

- Chiquadora Ridge west of the creek includes a part of the *major population* of the California gnatcatcher in the Chiquita Canyon area described above. The slopes east of the creek support a smaller population of the California gnatcatcher, probably due to the higher percentage of chaparral.

- Southern willow scrub in the revegetated wetland mitigation area (GERA) provides nesting habitat for least Bell's vireo, southwestern willow flycatcher, yellow-breasted chat, Cooper's hawk, red-shouldered hawk, and barn owl.

- A large colony of tricolored blackbirds periodically occurs in lower Gobernadora Canyon at the boundary on RMV property just south of the boundary with Coto de Caza. The birds nest in wetland areas within Coto de Caza just north of the RMV boundary and likely forage in the grassland and agricultural areas on RMV land.

- Other wildlife species in lower Gobernadora Canyon include white-tailed kite, long-eared owl, rufous-crowned sparrow, coast patch-nosed snake, northern red-diamond rattlesnake, western whiptail, San Diego horned lizard, Coronado skink and mule deer.

- Raptors using the grasslands and agriculture areas in the sub-basin for foraging include ferruginous hawk and merlin.

- Chiquadora Ridge within the Gobernadora sub-basin supports *major populations* of thread-leaved brodiaea (the location with 2,000 flowering stalks), many-stemmed dudleya (8,623 individuals), and intermediate mariposa lily (1,580 individuals in about 12 locations) described above for the Chiquita sub-basin.

- Central Gobernadora sub-basin east of the creek and the Central San Juan subunit north of the creek comprises a single, large population of many-stemmed dudleya supporting about 61 scattered locations ranging from 1 to 2,000 individuals. Although there is one location with 2,000 individuals, the remaining 60 locations number 225 or fewer individuals each. Combined, however, these locations total about 5,678 individuals and comprise a *major population.*

- **Upper Gobernadora sub-basin supports 13 locations of many-stemmed dudleya ranging from 5 to 513 individuals, and totaling 1,622 individuals. This population is considered an *important population* in a *key location* because it contributes to the geographic diversity and potentially is connected to any populations in Caspers Wilderness Park**

- Intermediate mariposa lily occurs in the Gobernadora sub-basin east of the creek and the northern portion of the Central San Juan Creek sub-basin in more than 50 locations, with eight locations numbering more than 200 individuals and the two largest locations 775 and 1,300 individuals each. This area supports a total of about 6,600 individuals. The location supporting 1,300 individuals is the single largest population in the subregion. These locations comprise a *major population* in a *key location*.

- Portions of the Ladera Ranch Mitigation site in GERA, on the west side of the Gobernadora Creek "spur" that enters the mitigation area, supports an estimated 10,000+

individuals of southern tarplant that have colonized the mitigation area. This population is a *major population* in a *key location.*

- Other sensitive plants known from the sub-basin include Catalina mariposa lily and Palmer's grapplinghook in the uplands and paniculate tarplant (CNPS List 4) in the valley bottom. A cluster of about 27 Catalina mariposa lily locations are on Chiquadora ridge associated with the cluster in the Chiquita sub-basin southeast of the wastewater treatment plant. Only three locations of Catalina mariposa lily are located east of Gobernadora Creek. There are about 23 locations of Palmer's grapplinghook in the sub-basin, with almost all east of the creek in association with the large population of many-stemmed dudleya. The paniculate tarplant is known from the along the creek near the boundary with Coto de Caza.

- The sensitive arroyo chub is known from the mouth of Gobernadora Creek at the confluence with San Juan Creek.

- Lower Gobernadora Canyon, including Sulphur Canyon, provides an important east-west connection between Chiquita and Wagon Wheel canyons to Bell Canyon and Caspers Wilderness Park. The riparian spine along the mainstem Gobernadora Creek, combined with the adjacent uplands along Chiquadora Ridge, provide a north-south habitat connection for mountain lions and other large mammals. The uplands along Chiquadora Ridge also provide habitat and a north-south connection for California gnatcatcher, cactus wren and a variety of other birds, reptiles and small mammals.

- Historic photographs indicate that Gobernadora Creek meandered freely across the valley floor over most of the length of the valley downstream from the mouth of Wagon Wheel Canyon.

- Potentially excessive surface and groundwater originates in the upstream portion of the sub-basin. These sources of water have contributed to erosion and incision of the mainstem and downstream deposition of sediments.

b. Planning Recommendations

1. Protection Recommendations

Note that the new protection recommendation is show in boldface.

- Maintain a continuous upland habitat linkage along the east-facing slopes of Chiquadora Ridge between San Juan Creek and Sulphur Canyon.

- Protect Sulphur Canyon rim-to-rim to maintain a functional biological connection from Gobernadora to Gen. Thomas F. Riley Regional Park in Wagon Wheel Canyon and upper Chiquita Canyon.

- Protect a 2,000- to 2,500-foot area along the southern boundary of Coto de Caza to provide for functional east-west wildlife movement from Sulphur Canyon to Bell Canyon.

- Minimize impacts to native grasslands. Any impacts resulting from future land uses will be addressed through an overall native grasslands restoration program, described in Section 6.

- Protect the southern willow scrub in GERA that provides nesting habitat for least Bell's vireo, southwestern willow flycatcher, yellow-breasted chat, Cooper's hawk, red-shouldered hawk, and barn owl.

- Avoid and minimize impacts to oak woodlands in northern Gobernadora along the ridgelines between the Gobernadora and Bell Canyon sub-basins.

- Keep open sufficient valley bottom south of Coto de Caza and above the knickpoint to allow creek meander for floodplain connection**.** Refer also to the Watershed and Sub-basin Planning Principles – Chiquita Gobernadora Sub-basin.

- Protect sufficient grassland habitat in the valley bottom in the northern portion of lower Gobernadora on RMV property to support a nesting population of the tricolored blackbird. (The existing nesting ponds are located within Coto de Caza.)

- Protect the thread-leaved brodiaea *major population* in a *key location* supporting approximately 2,000 flowering stalks on Chiquadora Ridge.

- Protect the 12 locations of intermediate mariposa lily comprising the *major population* on Chiquadora Ridge that overlaps the Chiquita and Gobernadora sub-basins, for total protection of about 1,580 individuals.

- Protect the Chiquadora Ridge *major population* of many-stemmed dudleya totaling about 8,623 individuals in approximately 47 discrete locations. This population includes 21 locations totaling 100 to 750 individuals each, with eight of these locations numbering more than 500 individuals.

- **Protect the upper Gobernadora *important population* and a *key location* of many-stemmed dudleya, totaling 1,622 individuals in 13 locations.**

- Protect the *major population* of southern tarplant totaling 10,000+ individuals located in GERA.

- Consistent with the Species Accounts recommendations and the Planning Recommendations for the Chiquita Sub-Basin, protect at least 80 percent of the coastal sage scrub and gnatcatcher sites along the eastern slopes of Chiquadora Ridge to contribute to achieving the overall goal of protecting at least 80 percent of the major population of gnatcatchers extending from Chiquita Canyon across to Gobernadora Creek. A further goal is the maintenance of connectivity between the protected coastal sage scrub patches to allow for dispersal of gnatcatchers between patches.

2. Management Recommendations

- Implement a cowbird trapping program to mitigate for potential impacts to native bird species associated with any proposed residential development in the sub-basin. The cowbird trapping program will be evaluated on an annual basis and trap locations and trapping effort will be adjusted as part of the overall adaptive management program (e.g., if the number of trapped cowbirds drops to a prescribed threshold, the trapping program may be terminated or otherwise modified).

- Protect existing riparian habitat downstream of the knickpoint in GERA for the least Bell's vireo, southwestern willow flycatcher and other riparian nesting bird species.

- Protect downstream habitat for the arroyo toad, least Bell's vireo, arroyo chub, and other sensitive riparian and aquatic species by maintaining hydrology, water quality and sediment delivery in San Juan Creek and minimizing additional loadings of nutrients or toxics.

- Implement a management program for protected sensitive plant locations in the sub-basin, including control of non-native invasive species, management of grazing as part of the adaptive management program, and prevention of human disturbance. The management recommendations for plants are described more fully in Section 4.

3. Restoration Recommendations

- Implement a coastal sage scrub restoration program in Sulphur Canyon to enhance habitat connectivity and mitigate for impacts to existing habitat associated with future development (*Figure 5-6*).

- Translocate salvaged many-stemmed dudleya to CSS/VGL restoration and enhancement areas where feasible and appropriate. Potential restoration and enhancement areas in the sub-basin include Chiquadora Ridge. Receiver areas should support clay soils suitable for dudleya and should be placed in locations that maximize connectivity and genetic exchange.

- Salvage clay topsoils from development areas where feasible and appropriate and transport to restoration areas. Salvaged topsoils may be used to create additional suitable dudleya habitat and may contain seedbank.

- Translocate salvaged intermediate mariposa lily bulbs to areas where suitable soil conditions occur. Specific translocation areas have not been identified, but based on the existing distribution, potential general translocation areas in the sub-basin area include Chiquadora Ridge.

- Initiate an intermediate mariposa lily seed collection program in 2003 if sufficient rain falls to warrant the collection program. Receiver sites should be identified in the winter of 2003 and a pilot planting program should be implemented to determine the effectiveness of propagation from seed.

- Implement a restoration program in Gobernadora Creek which addresses 1) the historic creek meander above the knickpoint; 2) upstream land use induced channel incision and erosion, including potentially excessive surface and groundwater originating upstream (*Figure 5-6*).

- Identify likely causes of erosion and potential measures to rectify causes of headcutting in the lower portion of the creek.

5.1.3 Central San Juan & Trampas Canyon Sub-basin

The Central San Juan & Trampas Canyon sub-basin is divided into two main geographic areas: the Central San Juan subunit and the Trampas Canyon subunit. The Central San Juan subunit includes the reach of San Juan Creek from just south of the confluence with Bell Creek to the east and the confluence with Gobernadora Creek to the west. The Central San Juan subunit

extends north from San Juan Creek approximately 1.6 miles and encompasses a large north-south trending canyon through the center of the subunit. The Trampas Canyon subunit is characterized by the silica sand mining operation that dominates the canyon and the rugged terrain between Cristianitos Canyon and San Juan Creek.

5.1.4 Central San Juan Subunit

a. Planning Considerations - Existing Conditions and Biological Resources

- Soils in the subunit generally include erodable silts and erodable clays on the uplands north of San Juan Creek and alluvial deposits in San Juan Creek.

- Elevations in the subunit range from approximately 200 feet above sea level in San Juan Creek to about 870 feet at the boundary with Caspers Wilderness Park.

- The subunit is approximately 5.5 miles from the Pacific Coast.

- Upland habitats include coastal sage scrub, chaparral, oak woodlands, grassland, agriculture and disturbed areas (Colorspot Nursery).

- Approximately 13-14 California gnatcatcher locations occur in the coastal sage scrub habitat north of the nursery.

- Gnatcatchers may use coastal sage scrub adjacent to San Juan Creek, and this habitat probably is important for dispersal.

- Upland terraces immediately adjacent to the creek provide foraging and estivation habitat for the arroyo toad.

- Other sensitive species in uplands include cactus wren, rufous-crowned sparrow, grasshopper sparrow, San Diego desert woodrat, orange-throated whiptail, coastal western whiptail, northern red-diamond rattlesnake, San Diego ringneck snake, California glossy snake, and western skink. Sandy soils in and adjacent to San Juan Creek provide suitable habitat for the silvery legless lizard.

- A breeding colony of tricolored blackbirds has been observed in the past in San Juan Creek east of the intersection of Ortega Highway and Cristianitos Road.

- Uplands support locations of many-stemmed dudleya, intermediate mariposa lily, Catalina mariposa lily and Palmer's grapplinghook. As described above, the many-stemmed dudleya and intermediate mariposa lily locations, in combination with the Gobernadora sub-basin locations, comprise *major populations* of these species.

- A small portion of the San Juan Creek *major population* of the arroyo toad occurs in central San Juan Creek extending from about 1,600 feet south of the confluence of Bell, Verdugo and San Juan creeks to about 1,000 feet east of the Antonio Parkway bridge (in the Chiquita Canyon sub-basin). Surveys in this reach have yielded persistent, but relatively small, population counts for the toad. (Note: Bloom [1998] mapped potential habitat to an area about 3,000 feet downstream of Antonio Parkway bridge, but toads have not been observed farther west than about the confluence with Chiquita Creek.) This portion of the San Juan Creek *major population* is not considered a *key location* for at least three reasons: (1) the viability of the upstream *key locations* in Upper San Juan Creek and Bell Canyon are not reliant on this small downstream population, (2) recent breeding has been limited to an area just downstream of Trampas Canyon supported by an artificial runoff source; and (3) the proliferation of arundo in this reach of San Juan Creek has contributed to the ongoing degradation of toad habitat.

- Riparian and aquatic habitats within the creek provide breeding habitat for least Bell's vireo as well as yellow-breasted chat, yellow warbler, white-tailed kite, Cooper's hawk, red-shouldered hawk, great-horned owl, barn owl, red-tailed hawk, great blue heron, southwestern pond turtle, two-striped garter snake, western spadefoot toad, arroyo chub and threespine stickleback.

- The subunit is a key connection, especially for movement between the northern and southern portions of the subregion. It provides continuous upland habitat linkage connections, particularly along the southern side of the creek, for species such as the California gnatcatcher, cactus wren, rufous-crowned sparrow, and a variety of reptiles and small mammals. Large- and medium-sized mammals known or expected to use the riparian habitat as "live-in" habitat and for movement include mountain lion, mule deer, bobcat, coyote, and gray fox.

- North-south movement of large wildlife between San Juan Creek and Trampas Canyon and Cristianitos Canyon currently is constrained by Ortega Highway. High traffic volumes on Ortega Highway contribute to wildlife mortality. Wildlife have been documented to use two wildlife corridors that cross under the highway; a corrugated steel pipe culvert near Radio Tower Road and a concrete box culvert west of Cristianitos Road connecting to Trampas Canyon.

b. Planning Recommendations

1. Protection Recommendations

- Maintain and manage riparian and aquatic habitats along San Juan Creek for breeding populations of the arroyo toad, least Bell's vireo, and other sensitive species such as yellow warbler, yellow-breasted chat, raptors, southwestern pond turtle, two-striped garter snake, western spadefoot toad, silvery legless lizard, arroyo chub and threespine stickleback.

- Provide upland foraging and estivation habitat within the upland terraces in the floodplain of San Juan Creek, with a particular focus on the south side of the creek, to maintain existing population levels of the arroyo toad.

- Protect upland habitat adjoining riparian and aquatic habitats to support nesting sites of southwestern pond turtle.

- Protect upland habitat adjoining riparian and aquatic habitats to support all life stages of western spadefoot toad.

- Protect breeding habitat and, to the extent feasible, protect foraging habitat for raptors adjacent to San Juan Creek.

- Provide floodplain and upland habitat linkages adjacent to San Juan Creek for east-west and north-south dispersal by the California gnatcatcher between the Chiquita Canyon and Cristianitos sub-basins.

- Provide a habitat linkage at the confluences of Verdugo Canyon and Bell Canyon with San Juan Creek. Maintain an adequate habitat linkage along central San Juan Creek for "live-in" dispersal and movement habitat for terrestrial species, including mountain lion, bobcat, coyote and mule deer between sub-basins and especially between Chiquita Ridge, Canada Gobernadora, Bell Canyon, upper San Juan Creek, Verdugo Canyon, Trampas Canyon and Cristianitos Canyon.

- Address the potential to improve north-south movement of large wildlife between San Juan Creek and Trampas Canyon and Cristianitos Canyon by assessing the benefits and feasibility of relocating Ortega Highway to the north side of San Juan Creek.

2. Management Recommendations

- Implement a bullfrog eradication program for the Cal-Mat Lake within San Juan Creek to help protect arroyo toads.

- Implement a management program for protected sensitive plant locations in the sub-basin, including control of non-native invasive species, management of grazing as part of the adaptive management program, and prevention of human disturbance. The management recommendations for plants are described more fully in Section 4.

3. Restoration Recommendations

- In coordination with upstream eradication efforts, implement an arundo removal program for San Juan Creek within Rancho Mission Viejo boundaries to protect arroyo toad habitat and other riparian areas.

- Translocate salvaged many-stemmed dudleya to CSS/VGL restoration and enhancement areas where feasible and appropriate. Potential restoration and enhancement areas in the sub-basin include Chiquadora Ridge. Receiver areas should support clay soils suitable for many-stemmed dudleya and should be placed in locations that maximize connectivity and genetic exchange.

- Salvage clay topsoils from development areas where feasible and appropriate and transport to restoration areas. Salvaged topsoils may be used to create additional suitable dudleya habitat and may contain seedbank.

- Translocate salvaged intermediate mariposa lily bulbs to areas where suitable soil conditions occur. Specific translocation areas have not been identified, but based on the existing distribution, potential general translocation areas in the sub-basin area include Chiquadora Ridge.

- Initiate an intermediate mariposa lily seed collection program in 2003 if sufficient rain falls to warrant the collection program. Receiver sites should be identified in the winter of 2003 and a pilot planting program should be implemented to determine the effectiveness of propagation by seed.

5.1.5 Trampas Canyon Subunit

a. Planning Considerations - Existing Conditions and Resources

Note that one new Planning Consideration based on recent information is shown in boldface.

- Sand, hard rock and minerals have been mined from Trampas Canyon over the past 50 years. An artificial lake dominates this sub-basin. The lake is steep-sided, relatively deep and the uplands surrounding it are dominated by ruderal vegetation.

- The Trampas Canyon silica mining activities have resulted in the creation of an 88-acre temporary storage facility/artificial wetland. Cessation of mining activity will result in the elimination of the hydrologic conditions that created this feature.

- Soils in the subunit are comprised of mainly silty-sandy soils similar to those found in the Chiquita Canyon and Gobernadora sub-basins. Smaller areas in the eastern portion of the subunit are underlain by clayey silts and sands.

- Elevations in the subunit range from approximately 300 feet above sea level at Ortega Highway to more than 1,000 feet along Radio Tower Road at the western boundary of the subunit.

- The western boundary of the subunit is approximately 5.5 miles from the Pacific Coast.

- The subunit supports a mosaic of upland habitats, including coastal sage scrub, chaparral, grassland, and patches of oak woodland.

- The subunit supports approximately four California gnatcatcher locations and approximately 20 cactus wren locations. Two of the four gnatcatcher locations are in the western portion of the subunit adjacent to the Chiquita Canyon sub-basin and the other two are in the southeastern portion of the subunit adjacent to the Cristianitos sub-basin. Both sets of gnatcatcher locations are a part of *important populations* in *key locations* and provide important connectivity function.

- The subunit is used by mule deer and mountain lions.

- Raptors nesting in oak woodlands in the subunit include turkey vulture, white-tailed kite, Cooper's hawk, red-shouldered hawk, red-tailed hawk, and great horned owl.

- Vernal pools along Radio Tower Road south of Ortega Highway (pools 7 and 8) appear to be associated with localized bedrock landslides from the San Onofre and Monterey formations. Vernal pool 7 supports both the Riverside fairy shrimp and San Diego fairy shrimp. The spadefoot toad also breeds in these vernal pools.

- The subunit also supports slope wetlands along Radio Tower Road that also appear to be associated with localized bedrock landslides from the San Onofre and Monterey formations.

- Other sensitive wildlife species known from the subunit include orange-throated whiptail, red-diamond rattlesnake, and San Diego desert woodrat near the mouth of the canyon.

- **One location of about 250 flowering stalks of the thread-leaved brodiaea occurs in the southeastern portion of the subunit. This location is an *important population* because it contributes to the geographic diversity of the species in the subregion.**

- The southern portion of the subunit, in conjunction with the Cristianitos sub-basin, supports a *major population* of the many-stemmed dudleya in a *key location*. The Trampas Canyon subunit itself supports about eight locations of 20-700 individuals each.

- The southern portion of the Trampas Canyon subunit supports eight locations of intermediate mariposa lily, with one population numbering 640 individuals, and the others numbering less than 50 individuals. These locations may be considered an *important population* because they contribute to the geographic diversity of the species in the subregion.

- Although the riparian vegetation in the subunit does not provide high value breeding habitat for species such as the least Bell's vireo and other sensitive, non-raptor riparian birds, the reservoir provides resting and foraging habitat for common water fowl and other birds associated with open water and wetland vegetation such as pied-billed grebe, western grebe, mallard, ruddy duck, ring-necked duck, double-crested cormorant, herons, and American coot.

- Coastal sage scrub in the central portion of the subunit provides a nearly continuous north-south connection between San Juan Creek and the upper portion of the Cristianitos sub-basin for bird species such as the California gnatcatcher and cactus wren. This portion of the subunit east of Trampas Creek, along with the Cristianitos Canyon sub-basin, connects populations to the north in Chiquita Canyon with the Camp Pendleton population south of the subregion.

- The central portion of the subunit east of the mine and Cristianitos Road is also a habitat linkage between San Juan Creek and Cristianitos, Blind, La Paz, and Gabino canyons used by mountain lion, mule deer, coyote, and bobcat. A concrete box culvert crossing of Ortega Highway just west of Cristianitos Road is a key crossing point for wildlife between San Juan Creek and Trampas Canyon.

- North-south movement of large wildlife between San Juan Creek and Trampas Canyon and Cristianitos Canyon currently is constrained by Ortega Highway. High traffic volumes on Ortega Highway contribute to wildlife mortality. Wildlife have been documented to use two wildlife corridors that cross under the highway; a corrugated steel pipe culvert near Radio Tower Road and a concrete box culvert west of Cristianitos Road connecting to Trampas Canyon.

b. Planning Recommendations

1. Protection Recommendations

Note that one new Protection Recommendation based on recent information is shown in boldface.

- Protect the vernal pools and their contributing hydrologic sources, Riverside fairy shrimp and San Diego fairy shrimp, as well as the slope wetlands and their primary sub-surface water supply recharge characteristics along Radio Tower Road.

- Avoid impacts to the *important populations* of California gnatcatchers and coastal sage scrub to the maximum extent feasible to maintain resident and dispersal habitat for the gnatcatcher between San Juan Creek and Cristianitos Canyon and populations on Camp Pendleton.

- Maintain upland north-south habitat linkages through the central and western portions of the Trampas Canyon subunit to convey wildlife movement and dispersal (especially gnatcatchers) between San Juan Creek, San Juan Capistrano, San Clemente, Cristianitos Canyon, the Donna O'Neill Conservancy at Rancho Mission Viejo and Camp Pendleton.

- Maintain upland east-west habitat linkage/wildlife corridor south of the artificial lake to link Prima Deshecha, Talega Open Space and other habitat to the west in San Juan Capistrano and San Clemente with the Donna O'Neill Conservancy and the Gabino, La Paz and Talega movement corridors. This habitat linkage should allow for dispersal of gnatcatchers and other avian species, as well as provide a movement corridor for large mammals such as bobcat, coyote, and mule deer.

- Address the potential to improve north-south movement of large wildlife between San Juan Creek and Trampas Canyon and Cristianitos Canyon by assessing the benefits and feasibility of relocating Ortega Highway to the north side of San Juan Creek.

- Maintain and manage riparian and aquatic habitats along San Juan Creek for arroyo toad, least Bell's vireo, and other sensitive species such as yellow warbler, yellow-breasted chat, raptors, southwestern pond turtle, two-striped garter snake, western spadefoot toad, silvery legless lizard, arroyo chub and threespine stickleback.

- Protect upland terraces and habitat adjoining San Juan Creek to support arroyo toad foraging and estivation.

- **Protect the location of approximately 250 thread-leaved brodiaea flowering stalks in the southeastern portion of the subunit. This location is considered an *important population* because it contributes to the geographic diversity of the species in the subregion**

- Protect the Trampas Canyon subunit component (approximately eight discrete locations) of the *major population* of many-stemmed dudleya that extends from the southern portion of the Trampas Canyon in the north, through the Cristianitos Canyon sub-basin south to the Talega development open space located in the San Clemente Watershed.

- Protect the eight known locations of intermediate mariposa lily comprising an *important population* in the subunit.

2. Management Recommendations

- Maintain stormwater flow characteristics comparable to existing conditions from Trampas Canyon into San Juan Creek to preserve breeding habitat for the arroyo toad population and other aquatic species in San Juan Creek.

- Implement a management program for protected sensitive plant locations in the sub-basin, including control of non-native invasive species, management of grazing as part of the adaptive management program, and prevention of human disturbance. The management recommendations for plants are described more fully in Section 6.

5.1.6 Verdugo Canyon Sub-basin

a. Planning Considerations - Existing Conditions and Resources

- Soils in the sub-basin are characterized by highly erodable silts and clays, with a coarse substrate in the streambed.

- Elevations range from approximately 400 feet above sea level at the confluence with San Juan Creek to approximately 1,800 feet at the Riverside County boundary.

- The sub-basin is approximately 8.5 miles from the Pacific Coast.

- The sub-basin is bordered by grasslands, coastal sage scrub, and small patches of oak woodland. Coastal sage scrub and chaparral are the predominant habitats, with the grasslands more prominent toward the canyon's confluence with San Juan Creek.

- The sub-basin supports sycamore riparian woodland and southern coast live oak riparian forest, with small patches of mule fat scrub. Southern willow scrub is present in tributaries to Verdugo Canyon.

- One California gnatcatcher and approximately 16 cactus wren locations occur in the coastal sage scrub along the canyon.

- The yellow-breasted chat occurs in riparian habitat in the sub-basin.

- Riparian habitat in the sub-basin supports nest sites for Cooper's hawk, red-shouldered hawk, red-tailed hawk, and barn owl.

- There is an historic record of a small breeding colony of the tricolored blackbird at the mouth of the canyon under the Ortega Highway bridge.

- The sub-basin provides a habitat connection for large- and medium-sized mammals. Mule deer are common in the canyon, and it provides habitat for mountain lion, coyote, bobcat, and gray fox.

- The sub-basin is central to the large block of relatively undisturbed habitat in the eastern part of the subregion.

b. Planning Recommendations

1. Protection Recommendations

- Protect, to the extent feasible, patches of coastal sage scrub and patches of southern cactus scrub that support cactus wren with a focus on maintaining contiguous habitat patches that provide north-south dispersal opportunities for the cactus wren and other species between the Lucas Canyon sub-basin to the north, and the Gabino Canyon/Blind Canyon and La Paz sub-basins to the south.
- Maintain habitat connectivity for movement of large mammals such as mountain lion, bobcat, coyote and mule deer between San Juan Creek and Cleveland National Forest; and between upper Verdugo Canyon and the headwaters of Gabino Creek.

- Protect riparian habitat that provides nest sites for Cooper's hawk, red-tailed hawk, red-shouldered hawk and barn owl.

- Protect grassland and wetland/riparian habitat at the mouth of Verdugo Canyon near Ortega Highway to retain tricolored blackbird habitat and to provide for wildlife movement to San Juan Creek.

- Protect Verdugo Canyon hydrology to maintain sources of coarse sediment that are important for arroyo toad breeding habitat in downstream areas.

5.2 San Mateo Creek Watershed

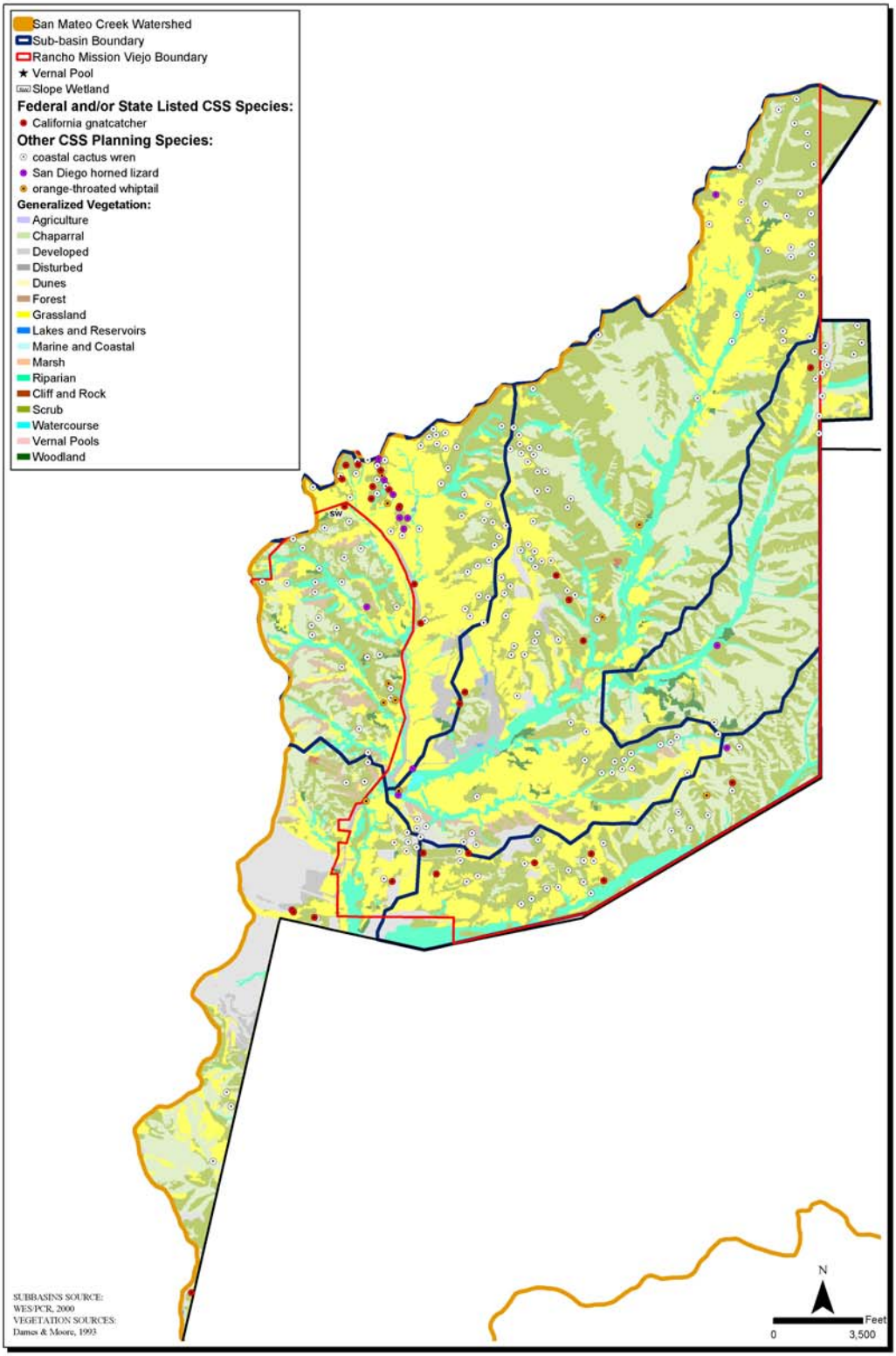
Figures 5-7 through *5-11* provide planning species maps for coastal sage scrub, riparian/aquatic habitat, historic raptor nest sites, grassland, and plants, respectively, for the San Mateo Creek Watershed.

5.2.1 Cristianitos Canyon Sub-basin

a. Planning Considerations - Existing Conditions and Resources

Substantial revisions to Planning Considerations based on recent information are shown in boldface.

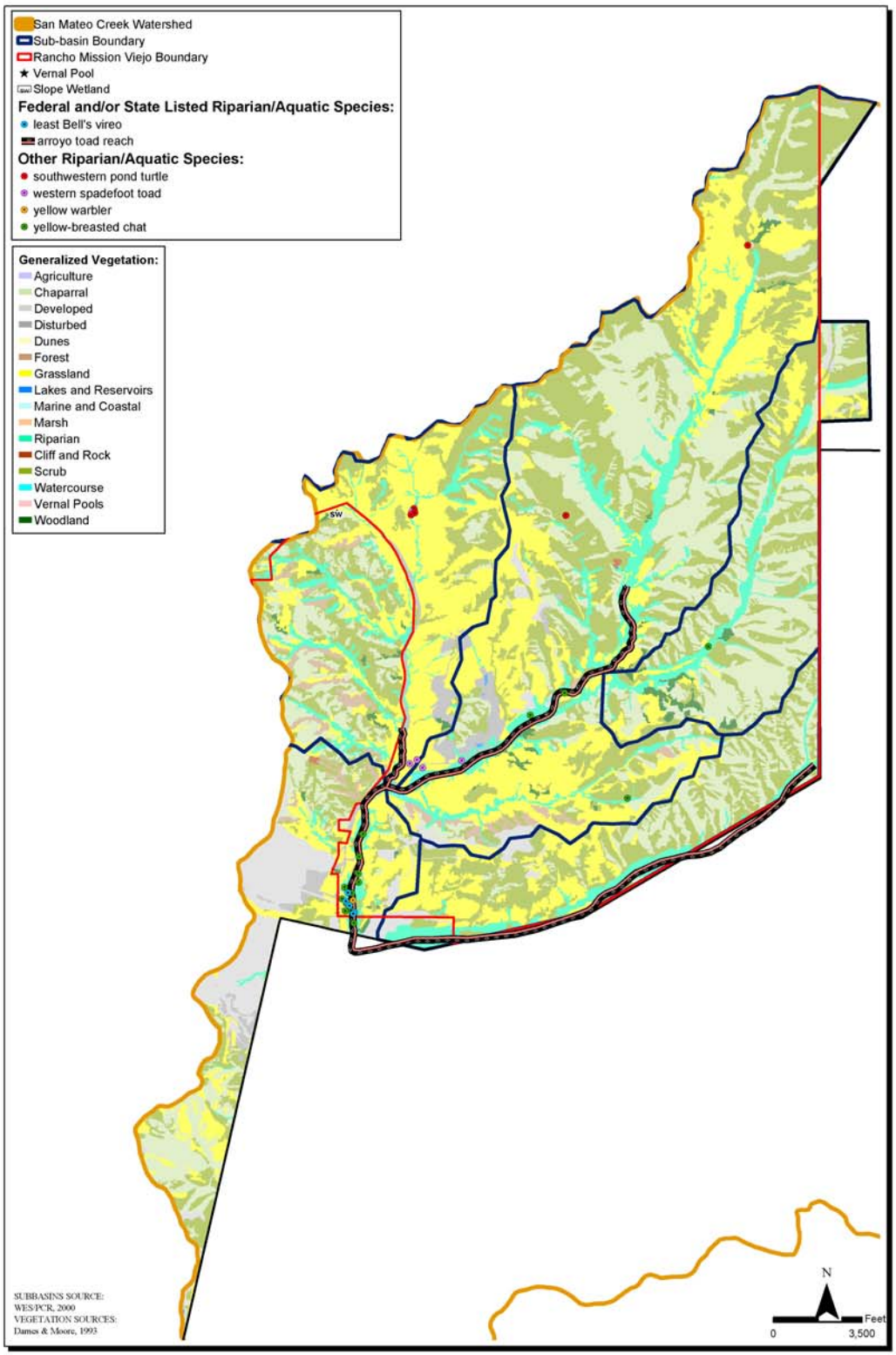
- Soils west of the creek are characterized by erodable silty sands while soils east of the creek generally are clays.



Draft NCCP/HCP Planning Guidelines

FIGURE 5-7

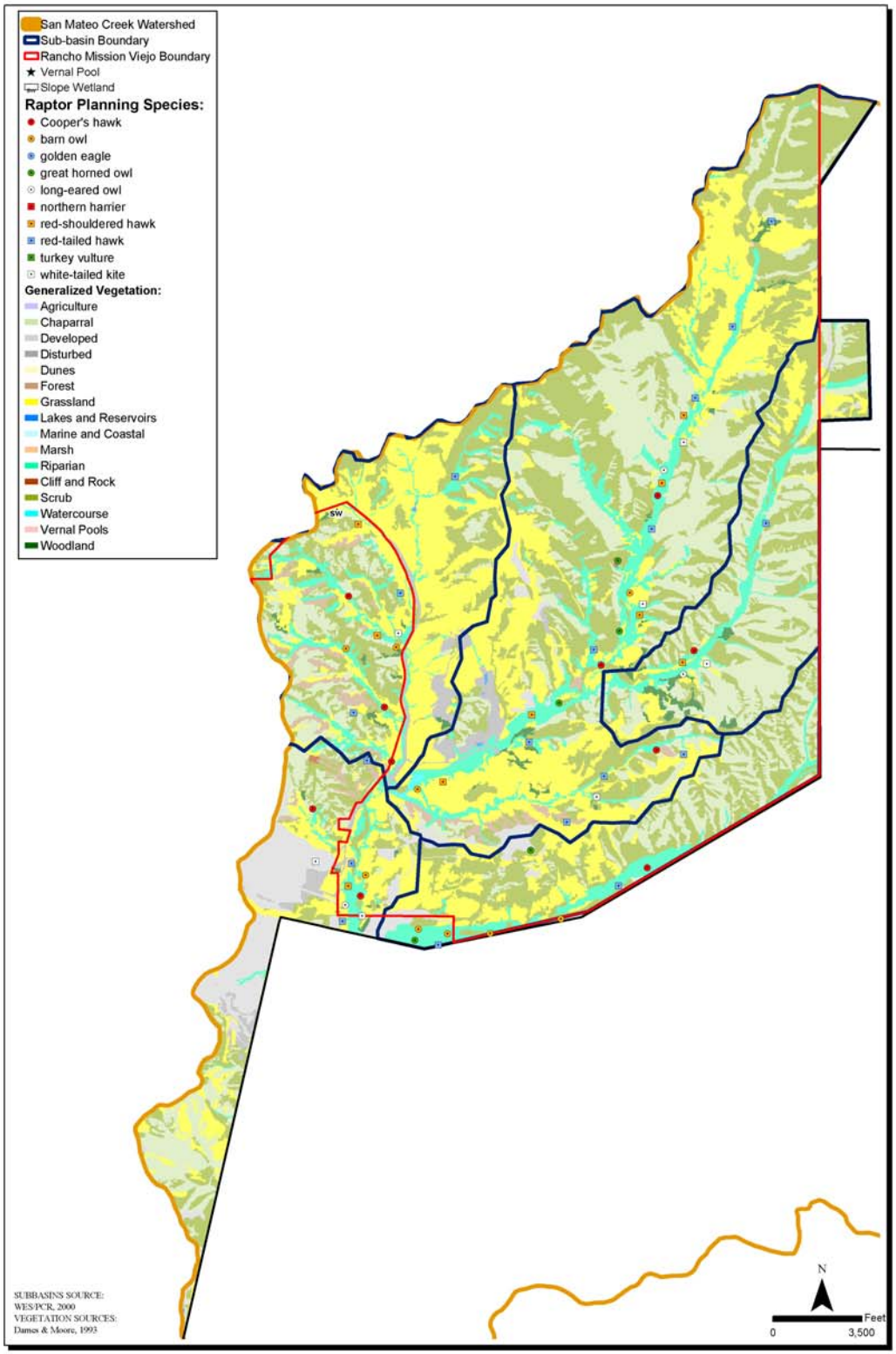
San Mateo Creek Watershed - Coastal Sage Scrub Wildlife Species



Draft NCCP/HCP Planning Guidelines

FIGURE 5-8

San Mateo Creek Watershed - Riparian/Aquatic Wildlife Species



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San Mateo Creek Watershed - Historic Raptor Nest Sites

FIGURE 5-9

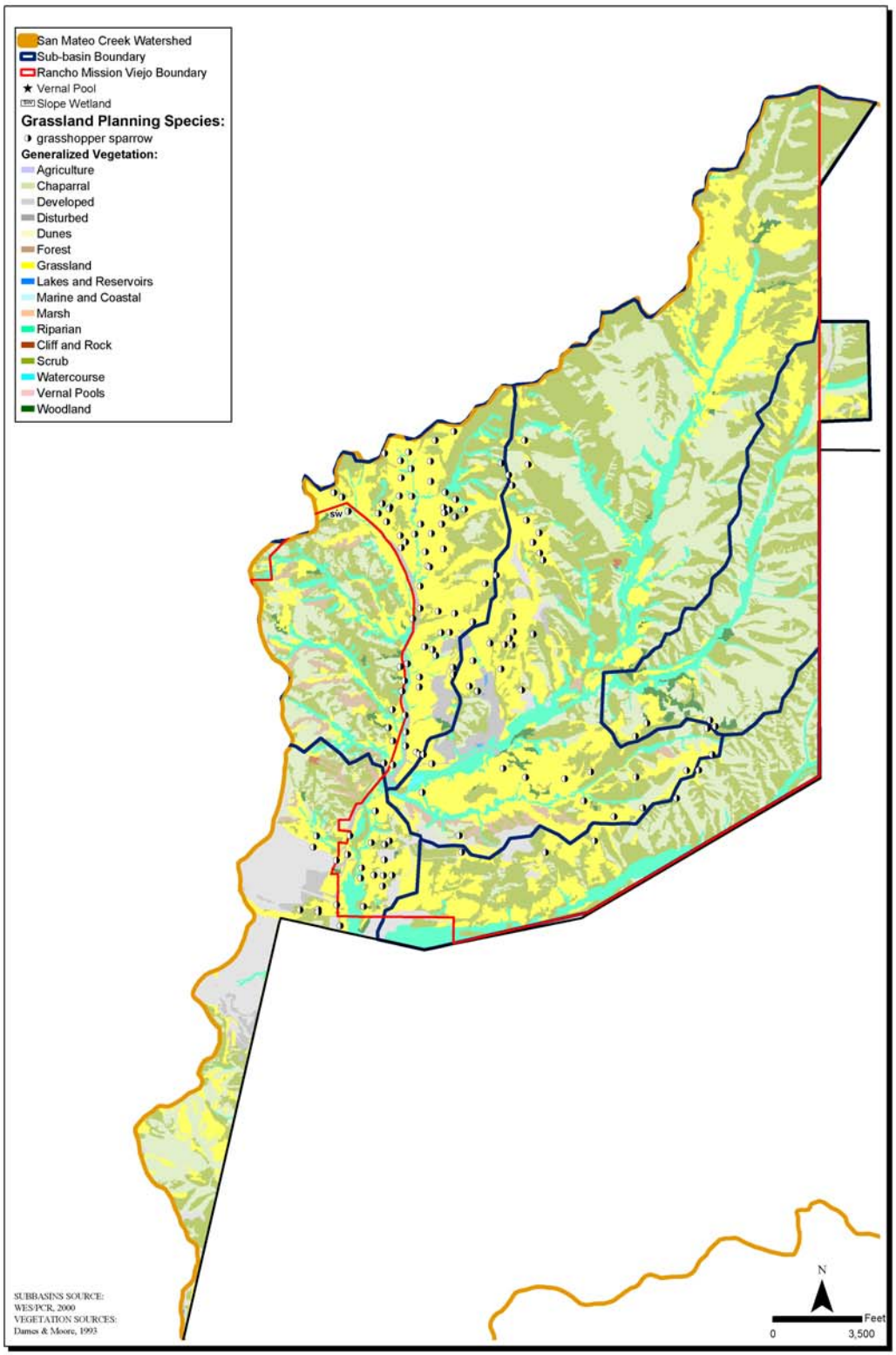

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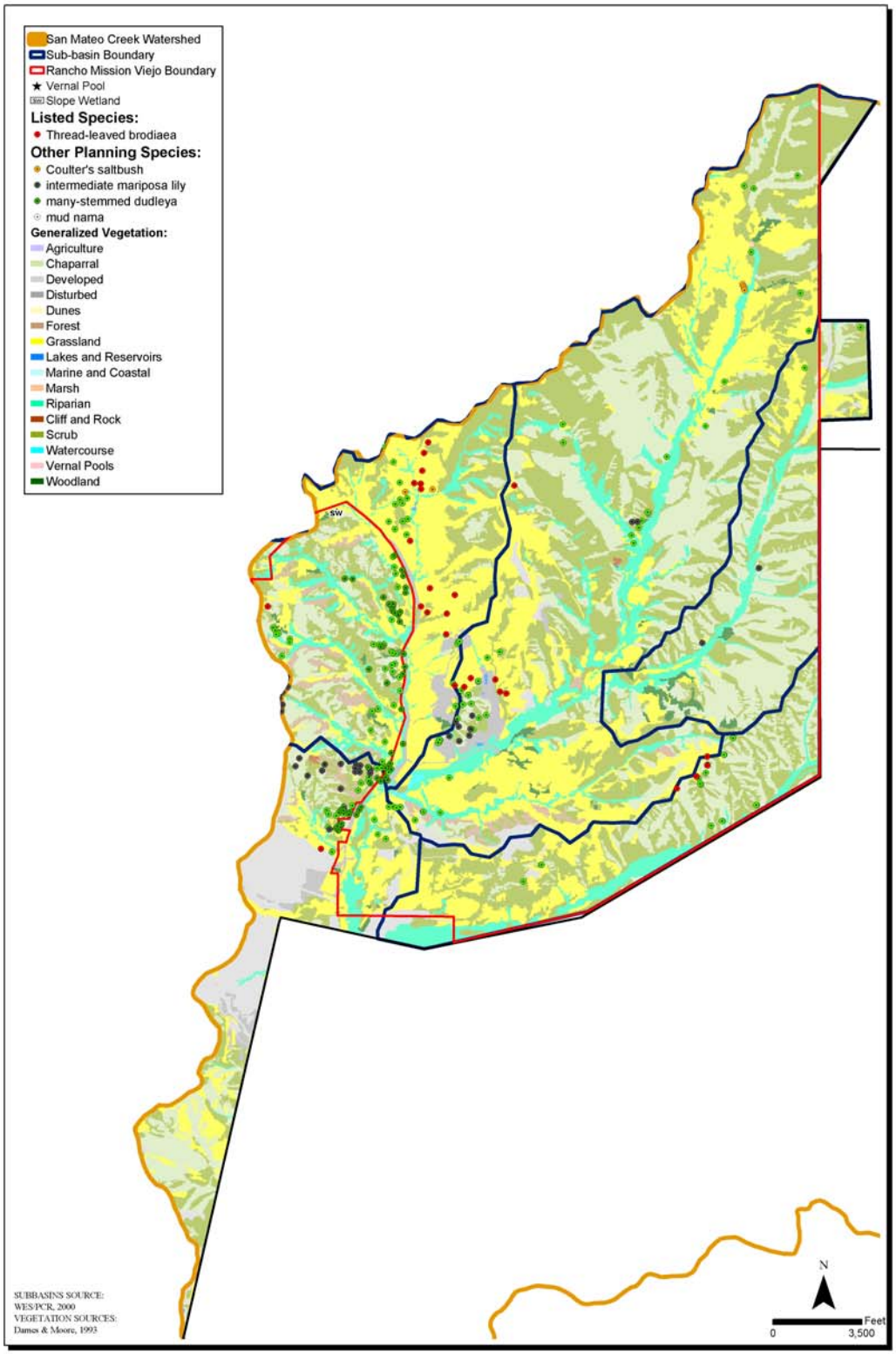
FIGURE 5-10

San Mateo Creek Watershed - Grassland Wildlife Species



Draft NCCP/HCP Planning Guidelines

San Mateo Creek Watershed - Plant Planning Species

FIGURE 5-11

- Elevations in the sub-basin range from approximately 280 feet above sea level at the confluence of Cristianitos and Gabino creeks to 1,000 feet at the head of Cristianitos Canyon.

- The sub-basin is approximately 5 miles from the Pacific Coast.

- The sub-basin is dominated by grasslands, a large component of which is native grassland (330 acres), and coastal sage scrub. The grassland is predominant in upper Cristianitos and along the eastern side of the canyon, while coastal sage scrub and chaparral dominate the east-facing slopes on the western side of the canyon within the Donna O'Neill Land Conservancy.

- Riparian habitats in the sub-basin include coast live oak riparian woodland, southern willow scrub and mule fat. Mule fat is a predominant component in the upper portion of the sub-basin. Tributaries to Cristianitos Creek from the Donna O'Neill Land Conservancy support coast live oak woodland and riparian woodland.

- The sub-basin supports approximately 12 California gnatcatcher locations and approximately 67 cactus wren locations. The 12 gnatcatcher locations, in combination with the two adjacent locations in the Trampas Canyon subunit, comprise an *important population* in a *key location.*

- Other upland sensitive species in the sub-basin include grasshopper sparrow, rufous-crowned sparrow, California horned lark, San Diego horned lizard, coastal western whiptail, orange-throated whiptail, western patch-nosed snake, northern red-diamond rattlesnake, and San Diego desert woodrat.

- The segment of Cristianitos Creek upstream of the confluence with Gabino Creek is part of the Lower Cristianitos Creek/Lower Gabino Creek arroyo toad *important population.* The segment of Cristianitos Creek north of the confluence with Gabino Creek is the transition zone between clay terrains that typify the substrate of the streamcourse in Upper Cristianitos Creek and sandy terrains that typify the substrate of the streamcourse below its confluence with Gabino Creek *(i.e*. Lower Cristianitos Creek). The creek habitat in this reach is considered marginal for breeding because of the fine sediments in the streamcourse and is peripheral to considerably more suitable breeding habitat downstream of the confluence with Gabino Canyon and within lower Gabino Canyon. Several surveys have only documented toads (5) in 2001 in this segment of Cristianitos Creek and they were only observed adjacent to the creek. There was no evidence that the toads were breeding in this segment of the creek. For these reasons, the segment of Cristianitos Creek upstream of the confluence with Gabino Creek is not considered part

of the *key location* within the Lower Cristianitos Creek/Lower Gabino Creek *important population*.

- Riparian and aquatic sensitive species in the sub-basin include white-tailed kite, Cooper's hawk, red-shouldered hawk, red-tailed hawk, great horned owl, barn owl, southwestern pond turtle, and western spadefoot toad. The pond turtle and spadefoot toad both occur in the stockpond along Cristianitos Creek in the upper portion of the sub-basin. The spadefoot toad also occurs in the southern part of the sub-basin just north of the confluence of Cristianitos and Gabino creeks.

- The grasslands provide foraging habitat for sensitive wintering raptors such as the ferruginous hawk and Swainson's hawk. Wintering burrowing owls also have been recorded in Cristianitos Canyon.

- **A large complex of six discrete locations of thread-leaved totaling approximately 6,100 flowering stalks occurs on the hill outcrop adjacent to the mine pits in the southern portion of Cristianitos Canyon on the boundary between the Cristianitos and Gabino and Blind Canyons sub-basins. As one of the two largest populations on RMV, this is a *major population* in a *key location.***

- About 13 other separate, scattered locations of thread-leaved brodiaea occur in the Cristianitos sub-basin, ranging from one to 120 flowering stalks. These locations comprise an *important population* because they potentially provide connectivity between offsite locations to the south in San Onofre State Park and Camp Pendleton to the south with planning area locations to the north (e.g., Chiquadora Ridge).

- **A *major population* and *key location* of many-stemmed dudleya with 164 locations and 34,137 individuals is located in the Cristianitos sub-basin and the southern portion of the Trampas Canyon subunit, extending south to the Talega development in the San Clemente Watershed and eastward into the western portion of the Lower Gabino and Blind Canyons sub-basin. This population, which is by far the largest contiguous population in the planning area, occurs on both RMV land and the Donna O'Neill Conservancy and extends into Talega Open Space.**

- Cristianitos Canyon within the Donna O'Neill Conservancy supports five locations of intermediate mariposa lily of unknown size (data base has population size of 1). These locations may be considered *important populations* because they contribute to the geographic diversity of the species in the subregion.

- Upper Cristianitos Creek supports two small locations of Coulter's saltbush numbering three and 12 individuals, respectively. This is an *important population* because of the rarity of this species in the region.

- The sub-basin contains clay soils that support other sensitive plants including the Palmer's grapplinghook and western dichondra.

- The sub-basin supports Catalina mariposa lily within clay and non-clay soils.

- The sub-basin probably serves as a primary north-south dispersal area for the California gnatcatcher between the large populations in Chiquita Canyon and Camp Pendleton.

- In combination with Talega, Gabino and La Paz canyons, the Cristianitos Canyon sub-basin provides a habitat connection for the mountain lion, mule deer, bobcat, coyote and gray fox to adjoining sub-basins.

b. Planning Recommendations

2. Protection Recommendations

Note that substantial revisions to Protection Recommendations based on recent information are shown in boldface.

- Protect a habitat linkage, consisting of the Donna O'Neill Land Conservancy and an area along the east side of Cristianitos Creek, to provide connectivity for gnatcatchers in the upper portion of the sub-basin with other populations in lower Gabino Creek and Camp Pendleton along lower Cristianitos/San Mateo Creek, and to maintain habitat integrity through connectivity within the Donna O'Neill Land Conservancy at Rancho Mission Viejo.

- Protect appropriate wetland and upland habitats to support a nesting population of the southwestern pond turtle, which occurs in the upper portion of the watershed in a small stockpond along Cristianitos Creek.

- Protect wetlands and adjoining upland habitat to support all life stages of western spadefoot toad.

- Avoid riparian/wetland habitat, including alkali wetlands, to the maximum extent feasible.

- Protect the majority of native grasslands in the sub-basin.

- Protect breeding habitat and, to the extent feasible, foraging habitat for resident and wintering raptor species.

- Protect the majority of the cactus wren locations within the sub-basin.

- Maintain a north-south habitat linkage along Cristianitos Creek between San Juan Creek and lower San Mateo Creek for dispersal and movement of gnatcatchers and other avian species, as well as large mammals such as mountain lion, bobcat, coyote, and mule deer, and, in particular, avoid occupied coastal sage scrub habitat in upper Cristianitos Canyon.

- Maintain an east-west habitat linkage from Gabino Creek to the confluence with Cristianitos Creek for wildlife movement between Gabino Canyon and the Donna O'Neill Conservancy at Rancho Mission Viejo.

- **Protect the location supporting approximately 6,100 thread-leaved brodiaea flowering stalks on the hill outcrop adjacent to the clay mine pits in the southern portion of Cristianitos Canyon. This location is the largest contiguous thread-leaved brodiaea population in the planning area and comprises a *major population* in a *key location*.**

- Protect 10 of the 13 small, scattered locations of thread-leaved brodiaea in Cristianitos Canyon, totaling approximately 300 flowering stalks. Maintain a continuous habitat connection between these scattered populations to allow for interactions and genetic exchange between the populations. These locations meet the criteria of *important populations* in *key locations* because they provide a linkage between brodiaea locations in the area and because the area has good potential for enhancement and restoration.

- **Protect the *major population* of many-stemmed dudleya extending from the southern portion of the Trampas Canyon subunit in the north, through the Cristianitos Canyon sub-basin south to the Talega development open space located in the San Clemente Watershed. This area supports the largest *major population* in the subregion with approximately 34,137 individuals in about 164 discrete locations.**

- Protect the two known *important populations* of Coulter's saltbush in the sub-basin.

2. Management Recommendations

- Pursuant to the Grazing Management Plan, implement grazing management techniques to help protect listed and other selected species and habitat, promote perennial grasses including native grasses, allow for continued cattle grazing sufficient to support cattle ranching operations, and, where appropriate reduce fuel loads for fire.

- Implement a management program for protected sensitive plant locations in the sub-basin, including control of non-native invasive species, management of grazing as part of the adaptive management program, and prevention of human disturbance. The management recommendations for plants are described more fully in Section 4.

3. Restoration Recommendations

- Implement a native grasslands restoration program, which will likely include grazing grassland restoration techniques set forth in the Grazing Management Plan, for the upper portion of the sub-basin (*Figure 5-12*).

- Translocate salvaged thread-leaved brodiaea and many-stemmed dudleya to CSS/VGL restoration and enhancement areas where feasible and appropriate. Potential restoration and enhancement areas in the sub-basin include upper Cristianitos Canyon and the southern portion of the Trampas Canyon subunit. Receiver areas should support clay soils suitable for brodiaea and dudleya, and should be placed in locations that maximize connectivity and genetic exchange.

- Salvage clay topsoils from development areas where feasible and appropriate and transport to restoration areas. Salvaged topsoils may be used to create additional suitable brodiaea and dudleya habitat and may contain seedbank.

- Translocate salvaged intermediate mariposa lily bulbs to areas where suitable soil conditions occur. Specific translocation areas have not been identified, but based on the existing distribution, potential general translocation areas in the sub-basin area include upper Cristianitos Canyon and the southern portion of the Trampas Canyon subunit.

- Initiate an intermediate mariposa lily seed collection program in 2003 if sufficient rain falls to warrant the collection program. Receiver sites should be identified in the winter of 2003 and a pilot planting program should be implemented to determine the effectiveness of propagation from seed.

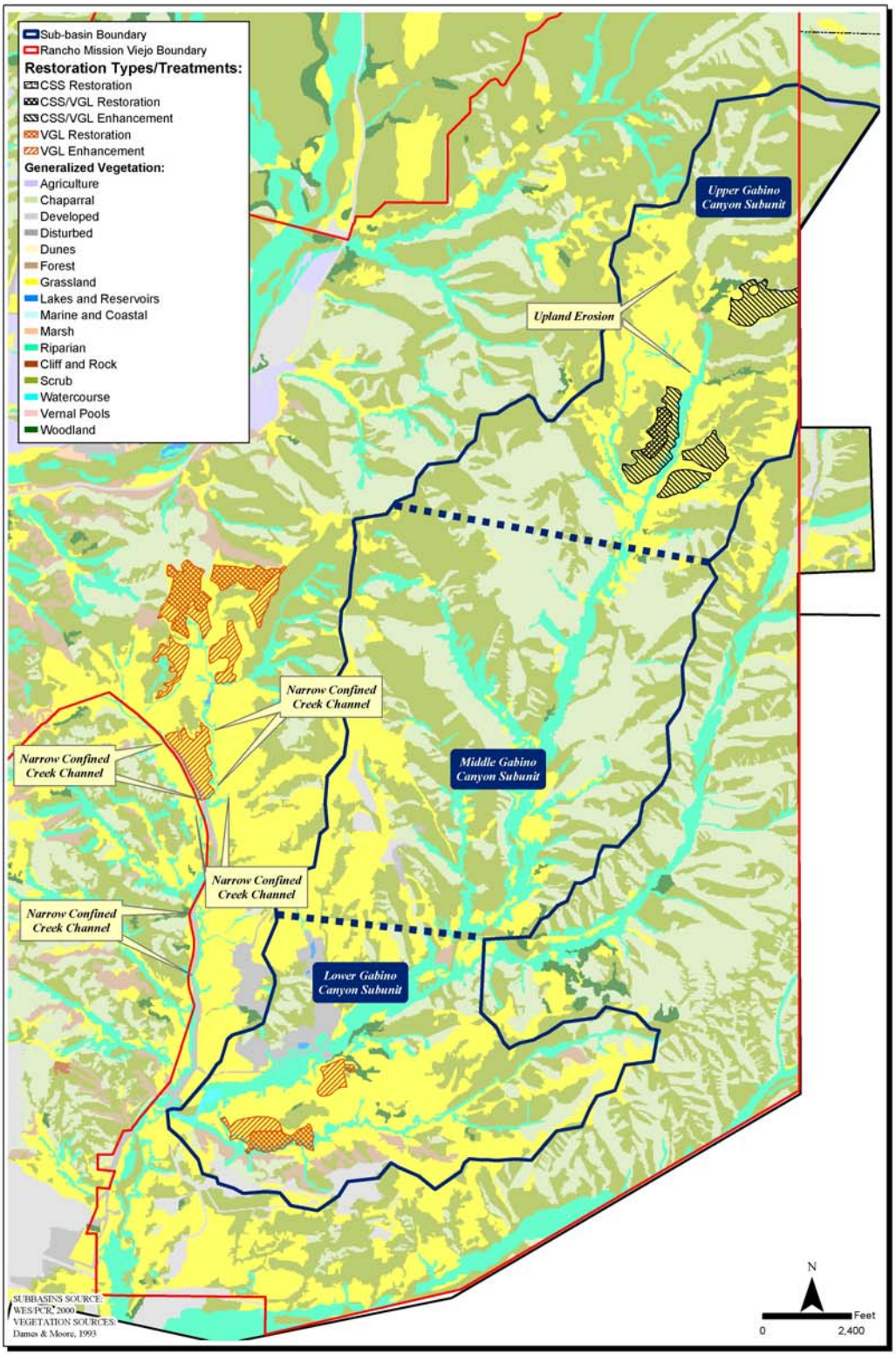


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FIGURE 5-12

CSS/VGL and Creek Restoration Areas for Cristianitos and Gabino & Blind Canyons Sub-basin

- Protect the upper watershed headwaters, address erosion from the clay pits and implement creek stabilization actions to address localized erosion presently causing increases in fine sediment yields in Upper Cristianitos Creek per the "Watershed and Sub-Basin Planning Principles" (*Figure 5-12*).

5.2.2 Gabino and Blind Canyons Sub-basin

The Gabino and Blind Canyons sub-basin is divided into three main planning subunits: the upper Gabino Canyon subunit, the middle Gabino Canyon subunit and the lower Gabino Canyon subunit including Blind Canyon. The upper Gabino Canyon subunit encompasses the open grasslands at the headwaters of Gabino Creek. The middle Gabino Canyon subunit is defined by the narrow, steep-sided canyon between upper Gabino Canyon and the confluence of Gabino and La Paz creeks. The lower Gabino Canyon subunit includes the portion of Gabino Canyon below its confluence with La Paz Creek and its confluence with Cristianitos Creek.

5.2.3 Upper Gabino Subunit

a. Planning Considerations - Existing Conditions and Resources

- Soils in the subunit are dominated by erodable clays, with smaller areas of erodable silts.

- Elevations in the subunit range from approximately 600 feet in the valley floor to 1,500 at the Riverside County boundary.

- The subunit is approximately 10 miles from the Pacific Coast.

- The open "bowl-shaped" portion of the subunit adjacent to upper Gabino Creek is characterized by predominantly native grasslands on the gentle slopes leading away from the creek, with coastal sage scrub and chaparral dominating the surrounding rugged canyons and hills.

- The riparian habitat in the subunit includes relatively open coast live oak riparian woodland, sycamore riparian woodland, and mule fat.

- While the population is not as dense as other areas within the planning area, numerous cactus wren locations are present in the subunit.

- The grassland in the subunit is high quality raptor foraging habitat and also provides habitat for the badger, burrowing owl, spadefoot toad and horned lark.

- The riparian habitat in the subunit supports a few raptor nest sites for white-tailed kite, red-shouldered hawk and red-tailed hawk, but not at the density of the downstream riparian habitats in middle Gabino Canyon where the canyon is narrow and closely bounded by rugged terrain.

- Aquatic habitat (Jerome's Lake) in the subunit supports the southwestern pond turtle and two-striped garter snake.

- Upper Gabino, in association with middle Gabino and upper La Paz canyons, supports 12 locations of many-stemmed dudleya ranging from about five individuals to about 1,500 individuals, and cumulatively totaling more than 4,100 individuals. These locations comprise a *major population* in a *key location.*

- A small population of about 100 individuals of Coulter's saltbush occurs west of and adjacent to the creek. This is an *important population* because of the rarity of this species in the region.

- The subunit supports a large population of western dichondra.

b. Planning Recommendations

1. Protection Recommendations

- Protect a habitat linkage along Upper Gabino to allow dispersal of large mammals.

- Maintain contiguity and connectivity of coastal sage scrub to provide dispersal habitat for the cactus wren and other sensitive coastal sage scrub species.

- Minimize, to the extent feasible, impacts to grassland foraging habitat for resident and wintering raptors, as well as "live-in" habitat for several other wildlife species that potentially occur in the subunit, including grasshopper sparrow, wintering burrowing owls, badger, spadefoot toad and horned lark.

- Protect Jerome Lake and surrounding uplands to maintain nesting habitat for the southwestern pond turtle.

- Protect the majority of native grasslands within the subunit. Manage and restore protected native grasslands in accordance with the management and restoration recommendations described below, including grazing management techniques .

- Protect the approximately six known discrete locations of many-stemmed dudleya in the subunit that are part of the *major population* in a *key location*.

- Protect the *important population* of Coulter's saltbush in the subunit.

2. Management Recommendations

- Implement a management program for protected sensitive plant locations in the sub-basin, including control of non-native invasive species, management of grazing as part of the adaptive management program, and prevention of human disturbance. The management recommendations for plants are described more fully in Section 4.

- Pursuant to the Grazing Management Plan, implement grazing management techniques to help protect listed and other selected species and habitat, promote perennial grasses including native grasses, allow for continued cattle grazing sufficient to support cattle ranching operations, and, where appropriate reduce fuel loads for fire.

3. Restoration Recommendations

- Implement a CSS/VGL restoration and enhancement program, which will likely include grazing grassland restoration techniques set forth in the Grazing Management Plan (*Figure 5-12*).

- Translocate any impacted many-stemmed dudleya to CSS/VGL restoration and enhancement areas in upper Gabino where feasible and appropriate. Receiver areas should support clay soils suitable for dudleya.

- Salvage clay topsoils from development areas where feasible and transport to restoration areas. Salvaged topsoils may be used to create additional suitable dudleya habitat and may contain seedbank.

- Implement a creek restoration program in the subunit to address erosion that is generating increases in fine sediment yields in Upper Gabino (*Figure 5-12*).

5.2.4 Middle Gabino Canyon Subunit

a. Planning Considerations- Existing Conditions and Resources

Note that a new Planning Consideration based on recent information is shown in boldface.

- Soils in the middle Gabino segment of the subunit include erodable silts on very steep slopes, with sand and cobble in the creek.

- Elevations in the subunit range from approximately 400 feet at the confluence with La Paz Creek and 1,000 feet on the ridges above the canyon.

- The western portion of the subunit is approximately 7 miles from the Pacific Coast.

- The northern two-thirds of the subunit is a narrow canyon bounded by steep, rugged slopes dominated by chaparral and smaller patches of coastal sage scrub. The lower one-third of the subunit broadens somewhat with flat benches supporting small patches of grassland.

- The riparian habitat in the subunit includes coast live oak riparian woodland, sycamore riparian woodlands, and smaller areas of coast live oak woodland and mule fat scrub. Some portions of the canyon also support floodplain (alluvial) scrub.

- Breeding sites for a small population of the arroyo toad (2 toads in 1998) extend approximately 3,000 above the confluence with La Paz Creek. This toad population is considered to be part of the *important population* in lower Gabino Creek.

- The riparian habitat supports several nest sites for raptors, including white-tailed kite, Cooper's hawk, long-eared owl, great horned owl, barn owl, and red-tailed hawk.

- The western portion of the subunit includes numerous cactus wren locations, although the population is not as dense as other areas of the planning area

- Other sensitive wildlife species in the subunit include rufous-crowned sparrow and orange-throated whiptail.

- **One location of about 183 thread-leaved brodiaea flowering stalks occurs in the western portion of the subunit. This location is an *important population* because it contributes to the geographic diversity of the species in the subregion.**

- Many-stemmed dudleya occurs in several small populations in the subunit, but in conjunction with the upper Gabino subunit and upper La Paz Canyon locations, comprise a *major population* in a *key location*.

b. Planning Recommendations

1. Protection Recommendations

Note that a new Protection Recommendation based on recent information is shown in boldface.

- Limit impacts to ridgelines to the extent feasible in order to protect coarse sediments.

- Protect a north-south habitat linkage through Middle Gabino, with particular focus on maintaining uninterrupted riparian woodland through Middle Gabino and along the western tributary into Middle Gabino.

- Protect the arroyo toad population upstream from the confluence with La Paz Creek by avoiding impacts to breeding, foraging and estivation habitat and protect canyons to avoid downstream impacts to the toad.

- Protect the diversity of raptor nesting habitat with particular focus on retaining documented nesting habitat for white-tailed kites and long-eared owls within the subunit.

- **Protect the location of approximately 183 thread-leaved brodiaea flowering stalks in the western portion of the subunit. This location is considered an *important population* because it contributes to the geographic diversity of the species in the subregion.**

- Protect the four known discrete locations of many-stemmed dudleya in the subunit that are part of the Cristianitos Canyon *major population* in a *key location*.

2. Management Recommendations

- Implement a management program for protected sensitive plant locations in the sub-basin, including control of non-native invasive species, management of grazing as part of the adaptive management program, and prevention of human disturbance. The management recommendations for plants are described more fully in Section 6.

- Pursuant to the Grazing Management Plan, implement grazing management techniques that provide for long-term protection of selected species and habitat within designated reserve areas.

- Implement a management program for protected raptor nesting habitat in the sub-basin, including the minimization of human disturbance during the breeding season.

5.2.5 Lower Gabino Subunit including Blind Subunit

a. Planning Considerations - Existing Conditions and Resources

- Soils along the lower reaches of Gabino Creek and in Blind Canyon primarily are clays which generate fine sediments**.**

- Elevations in the subunit range from approximately 280 feet at the confluence of Gabino and Cristianitos creeks and 400 feet at the confluence with La Paz Creek.
- The subunit is approximately 5 miles from the Pacific Coast.

- The subunit is dominated by native and annual grasslands, with smaller patches of coastal sage scrub and oak woodlands.

- The riparian habitat in the subunit consists of southern sycamore riparian woodland, coast live oak riparian forest and woodlands, mule fat scrub and smaller areas of southern arroyo willow forest, coast live oak forest and coast live oak woodland.

- Lower Gabino Canyon supports a moderate size arroyo toad breeding population (~40 adults in 1998) between Cristianitos and La Paz creeks. This population is considered to be an *important population* in a *key location* because of its link via Cristianitos Creek with the Talega *major population*.

- The grasslands adjacent to lower Gabino Canyon provide potential upland foraging and estivation habitat for the arroyo toad.

- The subunit supports approximately five California gnatcatcher locations and numerous cactus wren locations, although the cactus wren population is not as dense as other areas of the planning area.

- Riparian habitat provides nesting sites for several raptors, including white-tailed kite, Cooper's hawk, red-tailed hawk, and great horned owl, as well as the yellow-breasted chat.

- Other sensitive wildlife species occurring in upland habitats in the subunit include grasshopper sparrow, rufous-crowned sparrow, San Diego horned lizard, orange-throated whiptail, and red-diamond rattlesnake.

- As described above for the Cristianitos sub-basin, a large complex of thread-leaved brodiaea comprised of six discrete locations totaling approximately 6,100 flowering

stalks occurs on the hill outcrop adjacent to the mine pits in the southern portion of Cristianitos Canyon on the boundary between the Cristianitos and Gabino and Blind Canyons sub-basins. As one of the two largest populations on RMV, this is a *major population* in a *key location.*

- The western portion of lower Gabino and Blind Canyons supports several small locations of many-stemmed dudleya, with one location numbering about 400 individuals. These locations are physically associated with the Cristianitos sub-basin population and together with these locations form a *major population* and *key location*.

- Lower Gabino and Blind Canyons support two locations of intermediate mariposa lily of about 12 and 305 individuals, respectively. These locations are on the southern boundary with Cristianitos Canyon. These locations may be considered *important populations* because they contribute to the geographic diversity of the species in the subregion.

b. Planning Recommendations

1. Protection Recommendations

- Protect breeding and foraging habitat and movement opportunities within the streamcourse and adjacent alluvial terraces for the arroyo toad. Address potential upland estivation habitat needs in the context of best scientific information regarding the influence of topography, soils and other factors that appear to influence arroyo toad lateral movement and frequency of use in upland areas away from streamcourse habitat areas.

- Protect riparian habitat for nesting yellow-breasted chat within the subunit.

- Minimize impacts to California gnatcatcher locations.

- Minimize impacts to cactus wren locations.

- Minimize impacts to native grasslands within the subunit

- Protect breeding habitat, and to the extent feasible, protect raptor foraging habitat for resident and wintering species.

- Maintain an east-west habitat linkage from Gabino Creek to the confluence with Cristianitos Creek for wildlife movement between Gabino Canyon and the Donna O'Neill Conservancy at Rancho Mission Viejo.

- Protect approximately 80 percent of the discrete many-stemmed dudleya locations in lower Gabino and Blind Canyons such that the integrity of the *major population* in this area (i.e., the combined Cristianitos and Gabino and Blind Canyons) is preserved.

- Protect the two known locations of intermediate mariposa lily in lower Gabino Canyon.

- Protect the *major population* of brodiaea in a *key location* bordering the lower Gabino Canyon sub-unit and Cristianitos Canyon sub-basin supporting approximately 6,100 flowering stalks of thread-leaved brodiaea on the hill outcrop adjacent to the clay mine pits in the southern portion of Cristianitos Canyon.

2. Management Recommendations

- Implement a management program for protected sensitive plant locations in the sub-basin, including control of non-native invasive species, management of grazing and minimization of human access and disturbance as part of the adaptive management program. The adaptive management recommendations for plants are described more fully in Section 4.

- Protect the integrity of the arroyo toad population in lower Gabino and Cristianitos creeks, as well as San Mateo Creek, by maintaining hydrologic and sediment delivery processes, including maintaining the flow characteristics of episodic events in the sub-basin.

- Implement an invasive plant species eradication effort in Cristianitos Creek between Gabino Creek and Talega Creek.

3. Restoration Recommendations

- Implement a VGL restoration and enhancement program, which will likely include grazing grassland restoration techniques set forth in the Grazing Management Plan (*Figure 5-12*).

5.2.6 La Paz Canyon Sub-basin

a. Planning Considerations - Existing Conditions and Resources

- Soils in the sub-basin primarily are erodable silts on steep slopes, with cobbles and boulders in the creek.

- Elevations in the sub-basin range from approximately 400 feet above sea level at the confluence with Gabino Creek to 1,000 feet at the Riverside County boundary.

- The sub-basin is approximately 7.4 miles from the Pacific Coast.

- The predominant vegetation communities in the sub-basin are coastal sage scrub and chaparral.

- Riparian habitats in the canyon include southern sycamore riparian woodland, coast live oak woodland, and mule fat scrub. The canyon bottom also supports alluvial fan (floodplain) scrub.

- Sensitive wildlife species in the sub-basin include one location for the California gnatcatcher, 13 locations for the cactus wren, and records for the San Diego horned lizard, grasshopper sparrow, rufous-crowned sparrow and yellow-breasted chat.

- Riparian habitat in the sub-basin supports nest sites for the long-eared owl, white-tailed kite, Cooper's hawk, red-tailed hawk, and red-shouldered hawk.

- Sensitive plants in uplands adjacent to the creek include many-stemmed dudleya (forms part of the *major population* in upper Gabino Canyon) and two locations of intermediate mariposa lily, which comprise an *important population* because of their geographic separation from other locations.

- La Paz Canyon provides movement opportunities for wildlife including mountain lion, bob cat, coyote and mule deer among the Talega and Gabino and Blind Canyon subunits and Camp Pendleton.

b. Planning Recommendations

1. Protection Recommendations

- Maintain a habitat linkage along La Paz Canyon to convey movement and dispersal by mountain lion, bobcat, coyote and mule deer.

- Maintain contiguity and connectivity of coastal sage scrub to provide dispersal habitat for the cactus wren and other sensitive coastal sage scrub species.

- Maintain riparian habitat supporting nesting raptors.

- Protect alluvial fan scrub and hydrological conditions that support this plant community.

- Protect the locations of many-stemmed dudleya in the upper portion of the sub-basin.

- Protect the two discrete locations of intermediate mariposa lily in the middle portion of the sub-basin.

- Protect the integrity of arroyo toad populations in lower Gabino Creek, as well as downstream populations in Cristianitos and San Mateo creeks, by protecting the generation and transport of coarse sediments to downstream areas.

5.2.7 Talega Canyon Sub-basin

a. Planning Considerations - Existing Conditions and Resources

- Soils in the Talega sub-basin include erodable silts in steep slopes in the eastern portion and erodable clays in the western portion.

- Elevations in the sub-basin range from approximately 180 feet above sea level at the confluence of Talega and Cristianitos creeks to 800 feet in the eastern portion.

- The sub-basin is approximately 5 miles from the Pacific Coast.

- Upland habitats in the Talega Canyon sub-basin include coastal sage scrub, chaparral and grassland, with a mixture of sage scrub and chaparral in the upper portion of the canyon, and grassland and sage scrub in the lower part of the canyon south of the Northrop Grumman facility.

- Riparian habitat in Talega Creek includes sycamore riparian woodland and coast live oak riparian woodland. Substrate in Talega Creek is rock/cobble dominated with sandbars forming in depositional areas. The riparian habitat consists of dense stands of structurally diverse, mature coast live oak and southern sycamore riparian woodlands. Center portions of the creek support mule fat scrub and open sand bar habitat. The riparian zones are confined by the geology of the valley, but contain high topographic complexity, an abundance of coarse and fine woody debris, leaf litter, and a mosaic of understory plant communities. The creek contains shallow pools that retain water into the late spring and summer.

- Approximately seven California gnatcatchers locations and 22 cactus wren locations are scattered in the sage scrub on the south-facing slopes of the canyon.

- A *major population* of arroyo toad is present in Talega Canyon and was categorized as "abundant" by Bloom in 1998 based on the abundance of metamorphs. Although not as large as the *major population* in San Juan Creek, this population is one of the most significant in Orange County (Bloom, pers. comm.. 2004). In addition, this population is connected to the downstream arroyo toad populations in lower Cristianitos and San Mateo creeks on Camp Pendleton, as well as the upstream *key location* in lower Cristianitos and lower Gabino creeks.

- The two-striped garter snake has been observed in Talega Canyon.

- Raptors nesting in Talega Canyon include white-tailed kite, long-eared owl, Cooper's hawk, red-shouldered hawk, red-tailed hawk, great horned owl, and barn owl.

- The uplands adjacent to Talega Creek provide foraging and estivation habitat for the arroyo toad.

- Other sensitive upland wildlife species in the sub-basin include rufous-crowned sparrow, grasshopper sparrow, coastal western whiptail, orange-throated whiptail, San Diego horned lizard, northern red-diamond rattlesnake, and San Diego ringneck snake.

- Four locations of thread-leaved brodiaea totaling 288 flowering stalks occur in the Talega sub-basin on the mesa east of Northrop Grumman near the boundary with the Gabino and Blind Canyons subunit. Although not a large population, these locations may be considered an *important population* because they potentially contribute to connectivity and genetic exchange among the various nearby locations in the subregion.

- Fourteen locations of many-stemmed dudleya totaling 292 individuals are known from Talega Canyon east of Northrop Grumman. Although not a large population, these locations may be considered to comprise an *important population* because they contribute to geographic diversity in the subregion and potentially provide a connection with nearby populations on Camp Pendleton.

- Chaparral beargrass (CNPS List 1B) occurs at five locations on the steep, south-facing slopes in the eastern portion of the sub-basin and one in coastal sage scrub in the north-central part of the sub-basin.

- Talega Canyon is a habitat connection for large- and medium-sized mammals such as mountain lion, mule deer, bobcat, coyote, and gray fox in the San Mateo Watershed.

b. Planning Recommendations

1. Protection Recommendations

- Protect the integrity of arroyo toad populations in Talega Canyon by maintaining current stormwater runoff patterns and hydrologic conditions.

- Provide for comprehensive water quality treatment consistent with protection of arroyo toads in Talega Creek.

- Protect breeding and foraging habitat and movement opportunities within the streamcourse and adjacent alluvial terraces for the arroyo toad. Address potential upland estivation habitat needs in the context of best scientific information regarding the influence of topography, soils and other factors that appear to influence arroyo toad lateral movement and frequency of use in upland areas away from streamcourse habitat areas.

- Protect raptor nesting locations in the sub-basin, with particular attention to nesting of white-tailed kite and long-eared owl within the sub-basin.

- Maintain an east-west habitat linkage for gnatcatcher and cactus wren to protected habitat in the Talega and Forster Ranch Planned Communities.

- Maintain an east-west habitat linkage for large mammals along Talega Creek with sufficient width at confluence with Cristianitos Creek and along south-facing slope.

- Protect the four locations totaling 288 individuals of thread-leaved brodiaea in the Talega sub-basin east of the Northrop Grumman facilities. The locations are considered *important populations* because they contribute to the geographic diversity and provide additional sources for genetic exchange and connectivity in this portion of the subregion.

- Protect 12 locations of many-stemmed dudleya east of the Northrop Grumman facilities that may constitute an *important population*.

5.2.8 Other Planning Area

A small area comprising approximately 290 acres is located in the San Mateo Creek Watershed on RMV land south of the Cristianitos sub-basin, southeast of the Donna O'Neill Conservancy at Rancho Mission Viejo and west of the Lower Gabino and Blind Canyons sub-basin and the Talega sub-basin. This area warrants a discussion because although it is outside the identified

sub-basins it has important biological resources and reserve design considerations. The dominant landscape feature of the area is lower Cristianitos Creek south of the confluence with Gabino Creek where it exits RMV property.

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a. Planning Considerations – Existing Conditions and Resources

- Soils in the main canyon primarily sandy and soils on the uplands adjacent to Northrop Grumman are erodable clays.

- Elevations in the area range from approximately 200 feet above mean sea level in the creek bottom to approximately 300 feet on the mesa east of the creek.

- The area is approximately 4 miles from the Pacific Coast.

- Upland habitats in the area are dominated by annual grassland and small patches of coastal sage scrub and southern cactus scrub. A small patch of native grassland is present on the northeast corner of the area that overlaps with native grasslands in the Gabino and Blind Canyons sub-basin.

- Riparian habitats in lower Cristianitos Creek include southern coast live oak forest and woodland, southern sycamore riparian woodland, southern willow scrub, arroyo willow riparian forest, and mule fat scrub.
- Recent studies have identified substantial invasive plant species in this area.

- The small, scattered patches of coastal sage scrub support only one gnatcatcher location and the site is not part of an *important population*.

- Scattered cactus scrub supports about six cactus wren locations.

- The grasslands include about 16 locations of the grasshopper sparrow.

- Other sensitive upland wildlife species in the area include rufous-crowned sparrow, San Diego desert woodrat, orange-throated whiptail and western whiptail.

- The reach of Cristianitos Creek between the confluence with Gabino Creek and the planning boundary supports an *important population* of the arroyo toad in a *key location*. Toad counts for this reach have ranged from 11 individuals in 1998 to 37 in pre-1997 surveys, and toads have been found in the area in all surveys conducted.

- The uplands adjacent to Cristianitos Creek provide foraging and estivation habitat for the arroyo toad.

- The riparian habitat supports breeding habitat for the least Bell's vireo (5 locations), yellow-breasted chat (11 locations) and yellow warbler (1 location).

- A variety of raptors historically have nested in the riparian habitat, including long-eared owl (1 location), Cooper's hawk (1 location), red-tailed hawk (3 locations), red-shouldered hawk (2 locations), great horned owl (1 locations) and barn owl (1 location).

- The grasslands adjacent to Cristianitos Creek provide foraging habitat for both breeding resident and wintering raptors such as ferruginous hawk and Swainson's hawk.

- The only known sensitive plant from the area is many-stemmed dudleya, with approximately four discrete locations. Two of the locations have population counts of 20 and 33 individuals. These locations are part of the *major population* of dudleya in the Cristianitos and lower Gabino and Blind Canyons sub-basins.

- This area, in conjunction with the Cristianitos sub-basin, probably serves as a primary north-south dispersal area for the California gnatcatcher between large populations in Chiquita Canyon and Camp Pendleton.

- In combination with Talega, Gabino, La Paz, and Cristianitos canyons above the confluence with Gabino Creek, this area provides a habitat connection for the mountain, mule deer, bobcat, coyote and gray fox to adjoining sub-basins and Camp Pendleton.

b. Planning Recommendations

1. Protection Recommendations

- Protect a habitat linkage, consisting of the Donna O'Neill Land Conservancy and an area along the east side of Cristianitos Creek, to provide connectivity for gnatcatchers in the upper portion of the sub-basin with other populations in lower Gabino Creek and Camp Pendleton along lower Cristianitos/San Mateo Creek, and to maintain habitat integrity through connectivity within the Donna O'Neill Land Conservancy at Rancho Mission Viejo.

- Protect the majority of native grasslands in the area.

- Protect the integrity of arroyo toad populations in lower Cristianitos Creek by maintaining current hydrologic conditions.

- Protect breeding and foraging habitat and movement opportunities within the streamcourse and adjacent alluvial terraces for the arroyo toad. Address potential upland estivation habitat needs in the context of best scientific information regarding the influence of topography, soils and other factors that appear to influence arroyo toad lateral movement and frequency of use in upland areas away from streamcourse habitat areas.

- Protect breeding and foraging habitat for the least Bell's vireo, yellow-breasted chat and yellow warbler along lower Cristianitos Creek.

- Protect breeding habitat and to the extent feasible foraging habitat for resident and wintering raptor species.

- Maintain a north-south habitat linkage along Cristianitos Creek between San Juan Creek and lower San Mateo Creek for gnatcatchers and other avian species, as well as large mammals such as mountain lion, bobcat, coyote, and mule deer.

- Maintain an east-west habitat linkage from Gabino Creek to the confluence with Cristianitos Creek for wildlife movement between Gabino Canyon and the Donna O'Neill Conservancy at Rancho Mission Viejo.

2. Management Recommendations

- In conjunction with upstream and adjacent eradication efforts, implement an invasive plant species control program.

5.3 Other Planning Area-Wide Species Considerations

Several other planning species have broad geographic distributions and habitat requirements, and thus are best addressed at the subregional landscape level rather than the sub-basin level. These species include golden eagle, mountain lion and mule deer.

5.3.1 Golden Eagle

a. Planning Considerations – Existing Conditions and Resources

Golden eagles are an uncommon resident in the subregion. They are known to nest in the Cleveland National Forest, and although they are not known to nest on RMV, they occasionally forage in grasslands and agricultural areas throughout much of RMV, but especially in grasslands and agricultural areas in the Chiquita, Gobernadora, upper Gabino, Cristianitos and Talega sub-basins.

b. Planning Recommendations

1. Protection Recommendations

- Protect foraging habitat for the golden eagle to the extent feasible in the Chiquita, Gobernadora, upper Gabino, Cristianitos and Talega sub-basins.

5.3.2 Mountain Lion

a. Planning Considerations – Existing Conditions and Resources

Mountain lions range throughout much of the undeveloped portions of the planning area. The most extensive work on mountain lions in the study area has been conducted by Beier and Barrett (1993) using radiotelemetry to track lion movements. They included virtually the entire planning area as mountain lion habitat for the Santa Ana Mountains population. They also identified important lion use areas in the planning area, including Arroyo Trabuco, General Thomas F. Riley Regional Park and the Donna O'Neill Land Conservancy at Rancho Mission Viejo. The FTC surveys also recorded mountain lions at three camera stations: Northrop Grumman/Cristianitos, Blind and Gabino canyons, and Sulphur Canyon. While much of the planning area provides habitat for the mountain lion, Gabino, La Paz, and Blind canyons in the San Mateo Watershed and Verdugo Canyon in the San Juan Creek Watershed provide particularly important "live-in" and movement habitat connecting the southern portions of the planning area with the Cleveland National Forest. The western portion of the planning area, including Arroyo Trabuco, Sulphur Canyon, and Chiquita Ridge, provide important movement habitat, but are less suitable as "live-in" habitat because habitat blocks are not as large and adjacent urban development increases the risk of mountain lion mortality from vehicle collisions and depredation.

b. Planning Recommendations

1. Protection Recommendations

- Protect "live-in" habitat within the portion of the San Mateo Watershed in the planning area and Verdugo Canyon in the San Juan Creek Watershed adequate to meet the life history requirements of the mountain lion, comprising a large, unfragmented block of chaparral and coastal sage scrub directly connected to more than 100,000 acres in Caspers Wilderness Park, the Cleveland National Forest, and Camp Pendleton. (Beier and Barrett [1993] describe the Santa Ana Mountain Range as encompassing 800 mi^2 [512,000 acres) of "contiguous wildlands used by cougars." This habitat includes the Santa Margarita Mountains, the Santa Rosa Plateau, the Chino Hills and the San Joaquin Hills.) "Live-in" habitat provides adequate prey (primarily mule deer) and vertical and horizontal cover suitable as resting and bedding sites (e.g., woodlands and riparian areas, rocky areas). The reader should note that the "live-in" habitat within in the San Mateo Watershed portion of the planning area and Verdugo Canyon would only provide about 25-30 percent of an average mountain lion home range in the Santa Ana Mountains (Padley 1989, 1996), and that the home range of any lions using the planning area likely will include Caspers Wilderness Park, Audubon Starr Ranch Sanctuary, Cleveland National Forest, and Camp Pendleton.

- Maintain habitat connections throughout the planning area to provide movement opportunities for the mountain lion. As described above for individual sub-basins, as well as other areas in the planning area, important movement areas for mountain lion include Arroyo Trabuco, the Foothill-Trabuco Specific Plan Area, Chiquita Ridge, Sulphur Canyon, San Juan Creek, Trampas Canyon, Cristianitos Canyon, Verdugo Canyon, Gabino Canyon, La Paz Canyon and Talega Canyon.

2. Management Recommendations

In areas identified as "live-in" habitat or habitat connections, roads that are necessary to serve approved land and water uses located inside or outside the Habitat Reserve shall be designed and sited to accommodate mountain lion movement to the maximum extent feasible. Where roads are necessary, under the approved NCCP/HCP, they will be designed consistent with safety, roadway design criteria that are appropriate for the setting and desired roadway function. Roadway design shall include bridges and/or culverts large enough to accommodate mountain lion movement at key areas and, where appropriate and feasible, may include wildlife over crossings. As appropriate, fencing, grading and plant cover will be provided to serve wildlife crossings consistent with conservation principles and the adaptive management program. Where feasible and safe, lighting along roadways within the Habitat Reserve should

be avoided. Where roadway lighting within the Habitat Reserve is necessary for public safety reasons, it should be low-sodium or similar low intensity lighting that is directed away or shielded from the Habitat Reserve.

5.3.3 Mule Deer

a. Planning Considerations – Existing Conditions and Resources

Mule deer are common in the planning area in coastal sage scrub, chaparral, and woodland habitats. A radiotelemetry study of mule deer was conducted by Padley (1992) in what he termed the "Gabino" and "Chiquita" general areas. This study characterized habitats use and movement patterns and concluded that mule deer in the planning area are year-round residents (i.e., they do not migrate) and their home ranges are relatively small. Also, there are no critical resource areas (e.g., meadows or mineral licks). Areas frequently used by deer include most of the major drainages and canyons, including Chiquita Canyon, Blind Canyon, Verdugo Canyon, Gabino Canyon, La Paz Canyon, and Trampas Canyon. Deer also frequent Arroyo Trabuco, Gobernadora Canyon, Bell Canyon, and many other smaller drainages. In addition, mule deer are the main prey of mountain lions and their presence in the planning area is important for maintaining the mountain lion population.

b. Planning Recommendations

1. Protection Recommendations

- Protect “live-in” habitat within the portion of the San Mateo Watershed in the planning area adequate to meet the life history requirements of the mule deer, comprising a large, unfragmented block of chaparral and coastal sage scrub directly connected to Caspers Wilderness Park, the Cleveland National Forest, and Camp Pendleton.

- Protect “live-in” habitat within the San Juan Creek Watershed in the planning area adequate to meet the life history requirements of the mule deer, including Chiquita Ridge, Chiquadora Ridge, the ridgeline separating the Chiquita and Wagon Wheel sub-basins, and the ridgeline separating the Gobernadora and Bell Canyon sub-basins that directly connects to Caspers Wilderness Park and Audubon Starr Ranch Sanctuary.

- Maintain habitat connections throughout the planning area to provide movement opportunities for the mule deer. As described above for individual sub-basins, as well as other areas in the planning area, important movement areas for mule deer include Arroyo Trabuco, the Foothill-Trabuco Specific Plan Area, Chiquita Ridge, Sulphur

Canyon, San Juan Creek, Trampas Canyon, Cristianitos Canyon, Verdugo Canyon, Gabino Canyon, La Paz Canyon and Talega Canyon.

2. Management Recommendations

In areas identified as "live-in" habitat or habitat connections, roads that are necessary to serve approved land and water uses located inside or outside the Habitat Reserve shall be designed and sited to accommodate mule deer movement to the maximum extent feasible. Where roads are necessary, under the approved NCCP/HCP, they will be designed consistent with safety, roadway design criteria that are appropriate for the setting and desired roadway function. Roadway design shall include bridges and/or culverts large enough to accommodate mule deer movement at key areas and, where appropriate and feasible, may include wildlife over crossings. (note: of the large mammal species, mule deer are the most sensitive to bridge and culvert design. Designs that accommodate mule deer are generally suitable for mountain lion, bobcat and coyote.) As appropriate, fencing, grading and plant cover will be provided to serve wildlife crossings consistent with conservation principles and the adaptive management program. Where feasible and safe, lighting along roadways within the Habitat Reserve should be avoided. Where roadway lighting within the Habitat Reserve is necessary for public safety reasons, it should be low-sodium or similar low intensity lighting that is directed away or shielded from the Habitat Reserve.

SECTION 6: PLANNING AREA RESTORATION OVERVIEW

The term "restoration" is used very broadly in this document. It is intended to cover the spectrum of possible restoration activities, from creation of new habitats to enhancement of existing degraded habitats. It is anticipated that restoration actions will be undertaken in accordance with certified/approved restoration plans under the NCCP/HCP and SAMP/MSAA within the NCCP/HCP Habitat Reserve and in areas subject to the aquatic resource management program. As a planning area-wide comprehensive program, this section summarizes restoration recommendations for several sub-basins and explains how these recommendations could contribute to a more effective Habitat Reserve and adaptive management program. Restoration recommendations are considered preliminary and will be subject to refinement and modification during the NCCP/HCP approval and environmental documentation processes. Preliminary restoration areas are illustrated in *Figure 6-1*.

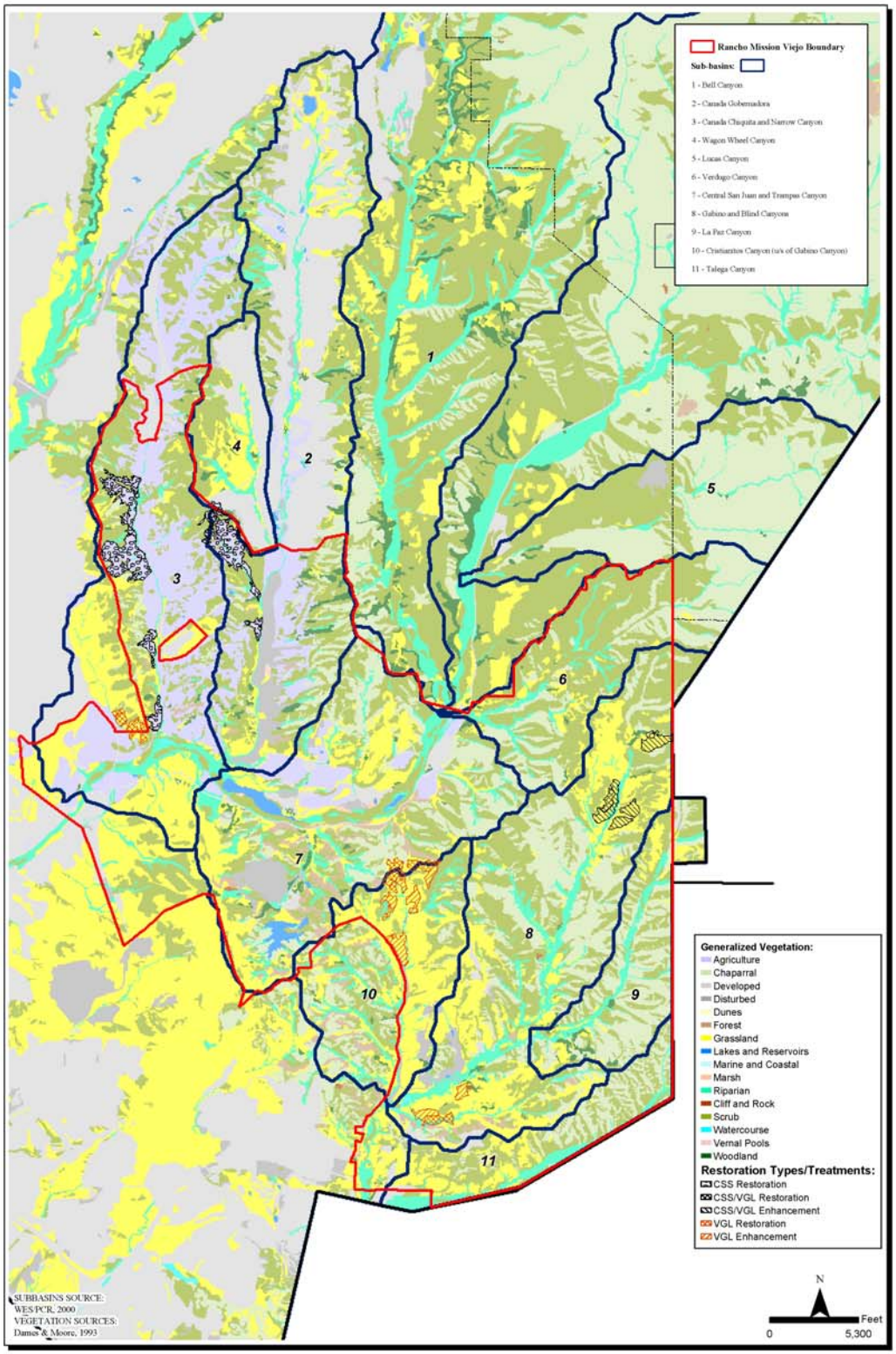
6.1 Restoration of Upland Habitats

6.1.1 Preliminary Designation of Coastal Sage Scrub Restoration Areas

The main goal of the coastal sage scrub (CSS) restoration program is to establish CSS in areas that: 1) probably supported CSS prior to ranching operations; and/or 2) would contribute to the Habitat Reserve by increasing the carrying capacity for the California gnatcatcher and other sage scrub species. With these goals in mind, the following areas have been tentatively identified for CSS restoration. Selection of these areas for restoration/enhancement will require additional field study to determine the likelihood of a successful restoration program, including factors such as soil conditions and presence of exotic species both within the restoration area and surrounding habitat.

- Sulphur Canyon in the Gobernadora sub-basin was identified for restoration/enhancement to provide additional habitat and enhance connectivity between Chiquita Canyon and Wagon Wheel Canyon to the west and Gobernadora and Bell canyons to the east. Sulphur Canyon is currently characterized by CSS on the slopes of the canyon and grazed annual grasses on the valley floor. Opportunities to improve "live-in" habitat and connectivity for California gnatcatchers through enhancement of existing CSS via the removal of grazing will be identified.

- Several side canyons between Chiquita Ridge and Chiquita Creek were identified for restoration/enhancement. Restoration of the two large canyons just northwest and southwest of the "Narrows" would greatly improve the habitat integrity of Chiquita Ridge, which narrows to less than 2,000 feet in width at the top of these side canyons,



Draft NCCP/HCP Planning Guidelines
Preliminary Restoration Areas

FIGURE 6-1

and provide substantial "live-in" habitat for California gnatcatchers and other species, and improve the integrity of the reserve system.

6.1.2 Preliminary Designation of Valley Needlegrass Grassland Restoration Areas

Areas identified for potential valley needlegrass grassland (VGL) restoration/enhancement includes areas that 1) currently support annual grasses, but have suitable soils and are adjacent to existing VGL; 2) currently support low quality VGL (i.e., areas with less than 10 percent cover of native grasses); and 3) would contribute to an overall native grasslands ecosystem (i.e., small, isolated patches of native grasslands would not be considered valuable to the overall system). Because establishing a functioning native grassland system is a goal of the restoration program, impacts to native grasslands in a particular sub-basin may be mitigated in another sub-basin to achieve greater value for the overall reserve system. Upper Cristianitos and portions of Blind Canyon mesa are recommended for VGL restoration.

- Upper Cristianitos is recommended for VGL restoration and enhancement to reduce the generation of fine sediments from clayey terrains, promote stormwater infiltration and to enhance the value of upland habitats adjacent to Cristianitos Creek. This area includes areas of annual grassland underlain by clay soils suitable for restoration and low quality VGL suitable for enhancement. These areas also are contiguous with existing medium quality grassland, suggesting a high likelihood of successful restoration/enhancement.

- Portions of Blind Canyon mesa are recommended for grassland restoration. This area has at least one patch of annual grassland suitable for restoration and possibly two patches of low quality VGL suitable for enhancement. These areas are adjacent to existing medium quality VGL, suggesting a high likelihood of successful restoration/enhancement. Additional fieldwork in the area may reveal additional restoration/enhancement opportunities.

6.1.3 Preliminary Designation of Coastal Sage Scrub/Valley Needlegrass Grassland Restoration Areas

The following areas are recommended for CSS/grassland restoration: Upper Gabino and in the Chiquita sub-basin in the area east of the Santa Margarita Water District wastewater treatment plant, the citrus groves west of Chiquita Creek and the disced areas west of the creek to the Chiquita ridgeline.

- Upper Gabino currently generates fine sediment due to extensive gully formation in the headwaters area. A combination of slope stabilization, grazing management and CSS/VGL restoration will reduce sediment generation and promote infiltration of

stormwater which will reduce downstream impacts. This area has been identified for a mix of CSS and VGL restoration because some areas mapped as grassland in 1990 have naturally revegetated with sparse CSS. Allowing a mixed community to regenerate may represent a more natural climax situation. This area has at least one area of annual grassland adjacent to the creek suitable for restoration and several patches of low quality VGL suitable for enhancement.

- As discussed above for CSS, restoration of disturbed areas of Chiquita Canyon west of Chiquita Creek will provide additional habitat for upland species occupying Chiquita Ridge, and particularly the gnatcatcher. Restoration of areas previously used for agricultural purposes, including grazing and citrus, will also benefit riparian species by removing uses that may contribute to downstream impacts. Additional field work will be needed to identify the areas best revegetated with CSS alone and CSS/VGL.

6.2 Restoration of Riparian/Wetland Habitats

6.2.1 Preliminary Designation of Riparian/Wetland Restoration Areas

The following areas are recommended for riparian/wetland restoration: Gobernadora Creek and upper Gabino Creek.

- Gobernadora Creek is recommended for riparian/wetland restoration to address the historic meander conditions and excessive sediment input resulting from upstream land uses. Restoration may include the construction of a detention/water quality basin below Coto de Caza.

- Creation of wetland breeding habitat for the tricolored blackbird should be considered a priority in the Gobernadora area because breeding populations have regularly occurred in the ponds in southern Coto de Caza. Northward extension of riparian habitats from GERA also would provide additional breeding habitats for least Bell's vireo, southwestern willow flycatcher, yellow-breasted chat, yellow warbler, raptors and other wetland species such as two-striped garter snake.

- Upper Gabino Creek currently generates fine sediment due to extensive gully formation in the headwaters area. To address this excessive sediment generation and reduce downstream impacts, both upland habitat restoration (described above) and wetland/riparian restoration is recommended. Depending on the type of wetland restoration in upper Gabino Canyon, several wildlife species could benefit, including two-striped garter snake, southwestern pond turtle, tricolored blackbird, and the riparian birds listed above.

6.2.2 Preliminary Designation of Small-scale Creek Stabilization Areas

Several smaller scale creek stabilizations are recommended to address locally induced headcuts in Chiquita Creek and upper Cristianitos.

- Locally induced headcuts (as contrasted with valley deepening reflecting longer-term geologic processes) are present in Chiquita Creek and Upper Cristianitos. Headcuts in Chiquita Creek are caused by the placement of road crossings or other anthropogenic causes. Headcuts in Cristianitos may have a similar origin but may also be influenced by long-term geologic processes. Further investigations of the causes of the Cristianitos headcuts will be necessary before identifying a specific restoration approach.