

Chapter 11

Alternatives to Take

The ESA requires that Section 10 permit applicants specify in an HCP what alternative actions to the take of federally listed species were considered and the reasons why those alternatives were not selected. The *Endangered Species Consultation Handbook* (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998) identifies two alternatives commonly used in HCPs: (1) an alternative that would reduce take below levels anticipated for the proposed project and (2) an alternative that would avoid take and hence not require a permit from USFWS. The NCCPA of 2002 requires that project alternatives be considered in the EIR prepared for the NCCP (Sect. 2820[e]) but not in the NCCP itself. This chapter identifies alternative measures considered that would avoid or minimize the potential for take of each federally listed species covered in this HCP/NCCP. The following discussion is limited to federally listed species because the ESA requires alternatives to *take*. When the permit is issued, take would only occur in connection with covered species that are currently listed or those expected to be listed at that time (late 2005). Project alternatives are considered in more detail in the draft EIR/EIS that accompanies this draft HCP/NCCP.

11.1 Alternatives to Take of San Joaquin Kit Fox

The primary impact on San Joaquin kit fox in the inventory area is the loss and fragmentation of suitable habitat, particularly grasslands, as a result of residential, commercial, and industrial development (see *Covered Activities and Projects* in Chapter 2). This loss of habitat could result in harm to San Joaquin kit fox and hence constitutes take. Another important source of potential mortality is construction of rural roads or increases in rural vehicle traffic. An alternative measure that would minimize or avoid take of San Joaquin kit fox is to prohibit urban development or rural roads in suitable San Joaquin kit fox habitat.

According to the habitat model developed for this HCP/NCCP, there are 5,866 acres of suitable core habitat for San Joaquin kit fox on land designated by approved General Plans for future development. Prohibiting development in these areas is infeasible because it is inconsistent with the General Plans of participating jurisdictions. Furthermore, suitable core habitat within the ULL is generally of lower quality than suitable core habitat outside the ULL (with the exception of the kit fox habitat and movement route in southwestern Antioch).

Because it is legally and practicably infeasible to preclude growth in all areas suitable for San Joaquin kit fox, this alternative was rejected.

An alternative that prohibits urban infrastructure projects outside the ULL from being implemented on suitable core habitat for San Joaquin kit fox would reduce take of this species but would also be infeasible. Suitable core or low-use habitat for San Joaquin kit fox occurs throughout the southern third of the inventory area. Linear urban infrastructure projects outside the ULL like the Vasco Road widening project or the Vasco Road to Byron Highway Connector project could not avoid suitable habitat for this species. In order to permit construction of these projects and to meet the goal of Contra Costa County to allow limited and reasonable rural development that supports urban development within the ULL, this alternative was rejected.

An alternative that limits traffic on rural roads within suitable core habitat for San Joaquin kit fox might reduce the incidence of mortality on roads and therefore reduce take in the inventory area. This alternative was deemed infeasible and rejected because limiting traffic on rural roads like Vasco Road or the Byron Highway is not under the control of the HCPA. This alternative may also have severe impacts on traffic elsewhere in the region, and may negate the benefits provided to San Joaquin kit fox in the inventory area by increasing vehicle mortality of kit foxes elsewhere in its range.

11.2 Alternatives to Take of Alameda Whipsnake

The primary impact on Alameda whipsnake is the loss of up to 29 acres of core and perimeter habitat (i.e., chaparral and scrub and a 500-foot buffer around these patches) and up to 341 acres of movement habitat (i.e., adjacent grassland, oak savanna, and oak woodland) as a result of urban development. This loss of habitat could harm Alameda whipsnake and hence constitutes take. Covered urban infrastructure projects outside the ULL would have no impact on suitable breeding habitat for Alameda whipsnake. Some projects, however, could affect suitable movement habitat for whipsnake and pose a new or increased hazard to whipsnakes moving between suitable breeding patches. For example, the Marsh Creek Road Realignment project could increase the volume and speed of traffic in areas that whipsnakes may traverse. These changes could lead to increased road mortality of the species.

The implementation of vegetation- and preserve-management measures (e.g., Conservation Measures 1.2, 2.4, 2.6, 2.8) are expected to benefit Alameda whipsnake and contribute to recovery in the long term. However, these measures could result in habitat disturbance and loss, as well as harm and harassment of individuals (i.e., take) over the short term. Under the conservation strategy, covered activities must avoid or minimize take of Alameda whipsnake (see Chapter 6).

Take of Alameda whipsnake could be reduced slightly by prohibiting development within suitable core habitat. This would affect development southwest of Clayton and jeopardize that City's ability to implement its General Plan (City of Clayton 1985). This alternative was rejected because the impact represents less than 0.1% of the suitable core and perimeter habitat available in the inventory area (9,332 acres) and the affected site has relatively low value for the species because of its proximity to an active quarry. The Plan would preserve 70% of the remaining unprotected core habitat for Alameda whipsnake (550 acres) in the inventory area, resulting in approximately 92% of this habitat preserved overall (including existing protected areas). This conservation more than offsets up to 2 acres of impact to core habitat for this species. Complete avoidance of this 2 acres would have minimal additional biological value.

Take of Alameda whipsnake could also be reduced slightly by prohibiting development in suitable movement habitat for the species. This alternative would also only affect development in Clayton. This alternative was rejected because it is not feasible and results in only slight biological benefits. Prohibiting development in Clayton on 341 acres would be inconsistent with the Clayton General Plan and would also be inconsistent with the goals of that city to allow reasonable development at its borders. The movement habitat for Alameda whipsnake around Clayton that would be removed through development does not link important core habitat for the species, nor does it provide essential movement routes. Allowing development in the area would provide money for protection of higher-value core habitat and essential movement habitat among patches of core habitat.

11.3 Alternatives to Take of Giant Garter Snake

Covered activities in combination with conservation measures are not expected to result in the direct mortality of giant garter snakes. There are no records of giant garter snakes in the inventory area, and suitable habitat is restricted to small areas at the eastern edge of the inventory area, outside the area where most covered activities will occur. Therefore, the level of take of giant garter snake is expected to be minimal or nonexistent. If direct mortality does occur (e.g., through ongoing and routine agricultural activities on lands bordering HCP/NCCP preserves), it will be minimized and mitigated according to established USFWS standards (see Conservation Measures 3.6 and Chapter 6). No alternatives are available that would further reduce take of giant garter snake.

11.4 Alternatives to Take of California Red-Legged Frog

The primary impact of the project on California red-legged frog is the loss of breeding, movement, and aestivation habitat as a result of urban development. This loss of habitat could harm (i.e., kill or injure) California red-legged frogs

and hence constitutes take. Take could also result from construction and operation of urban infrastructure projects outside the ULL covered by the HCP/NCCP.

Conservation and management actions that take place on HCP/NCCP preserves, particularly those that temporarily restore or create habitat, have the potential to take California red-legged frogs. Although these measures could harm individual frogs, they are designed to provide a net benefit to the species on HCP/NCCP preserves. Under the conservation strategy, take will be minimized or avoided through implementation of Conservation Measures 1.5 and measures discussed in Chapter 6.

Take of California red-legged frog could be further minimized or avoided if urban development or urban infrastructure projects outside the ULL did not encroach on suitable habitat for this species; fill or disturb suitable breeding sites (e.g., ponds, seasonal wetlands, streams); or remove suitable aestivation or movement habitat connecting suitable breeding sites. This alternative was rejected because it is not feasible, it is inconsistent with adopted local General Plans, and it does not meet the purpose and need of the HCP/NCCP permittees to achieve reasonable amounts of urban development and growth within their jurisdictions. Suitable habitat for California red-legged frog could be avoided by urban development to a greater degree than is proposed in this Plan by requiring all development projects to avoid all suitable habitat for this species and to mitigate their impacts on site. This alternative approach, however, would result in a patchwork of mitigation sites that do not function well biologically on a regional scale. In general, habitat for California red-legged frog is of lower quality within the ULL than outside the ULL. This alternative conservation approach was rejected because it would result in a biologically inferior outcome. It is also more costly because land within the ULL is generally much more expensive than land outside the ULL. The HCP/NCCP is designed to accept a limited amount of take of this species in lower-quality habitat in exchange for protection, enhancement, and restoration of higher-quality habitat outside urban areas.

An alternative HCP/NCCP that excludes urban infrastructure projects outside the ULL would also reduce the amount of take of California red-legged frog. This alternative is also infeasible because it does not meet the County's goal to allow for limited and reasonable rural development in unincorporated areas and to support and encourage urban development within the ULL.

11.5 Alternatives to Take of California Tiger Salamander

The primary mechanisms of impacts on California tiger salamander are urban and rural development occurring on suitable breeding ponds and other wetlands or in suitable upland aestivation habitat, and the fragmentation of suitable breeding habitat. The conversion of suitable breeding and movement habitat to

irrigated agriculture (e.g., vineyards) is also a threat to the species. Alternatives that may reduce take of California tiger salamander in the inventory area include prohibiting development or irrigated agriculture on suitable breeding or movement/aestivation habitat. The conversion of rangeland to irrigated agriculture such as vineyards is rare within the inventory area. The majority of vineyard development occurs on land already in use for other irrigated agriculture or dryland farming (see Figure 3-3). Because vineyard development or other irrigated agriculture is not a covered activity under this Plan, prohibiting its expansion is infeasible. Because little or no development of irrigated agriculture occurs on rangeland (i.e., potential suitable habitat for California tiger salamander), this alternative may have little or no benefit to the species.

Suitable habitat for California tiger salamander could be avoided by urban development to a greater degree than is proposed in this Plan by requiring all development projects to avoid all suitable habitat for this species and to mitigate their impacts on site. This alternative approach, however, would result in a patchwork of mitigation sites that do not function well biologically. In general, habitat for California tiger salamander is of lower quality within the ULL than outside the ULL. This alternative conservation approach was rejected because it would result in a biologically inferior outcome. This alternative approach is also more costly because land within the ULL is generally much more expensive than land outside the ULL. The HCP/NCCP is designed to accept a limited amount of take of lower-quality habitat in exchange for protection, enhancement, and restoration of higher-quality habitat outside urban areas.

11.6 Alternatives to Take of Longhorn Fairy Shrimp

Covered activities in combination with conservation measures are not expected to result in take of longhorn fairy shrimp. There are no records of longhorn fairy shrimp in the inventory area except in sandstone pool habitats in and adjacent to Vasco Caves Regional Park. No covered activities will occur within this park. In the event that additional populations of this species are found in the inventory area, the Conservation Strategy requires minimization and mitigation for longhorn fairy shrimp (see Conservation Measures 3.8 and measures discussed in Chapter 6).

One alternative that would reduce the amount of take potentially allowed under this Plan is to make longhorn fairy shrimp a “no-take” species. Under this alternative, covered activities and projects would not be allowed to take longhorn fairy shrimp. This alternative was rejected to allow for limited impacts on the species in the event that new populations are found. Because the process for mitigating impacts on the species under the Plan requires additional consultation with USFWS, there will be additional opportunity to evaluate project-specific impacts on this species. Take of this species that would jeopardize its continued existence would not be allowed under the Plan.

11.7 Alternatives to Take of Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

The primary mechanism resulting in impacts on vernal pool fairy shrimp and vernal pool tadpole shrimp in the inventory area is the loss of seasonal wetlands that may be suitable for these species as a result of development (e.g., urban development, rural ranchettes, rural infrastructure). Adverse impacts on these species in the inventory area have also occurred from conversion of suitable seasonal wetlands to irrigated agriculture. Impacts on these species may occur from general water diversions (e.g., diversion to stockponds, lowering groundwater tables through water wells, reducing stream flow) that may take place in the inventory area. Intensive livestock grazing may degrade seasonal wetlands and take vernal pool fairy shrimp or vernal pool tadpole shrimp. Information used to develop species habitat models were not sufficiently detailed to determine the distribution and quality of vernal pool habitat on lands considered for development or for preservation. Consequently, preconstruction and planning surveys will be conducted to identify suitable habitat for covered shrimp species in potential development and preserve lands (see Chapter 6).

An alternative to take of these species is to prevent urban development from filling or degrading any seasonal wetlands in the inventory area. This alternative was rejected because it is not feasible and may result in a biologically inferior outcome. This alternative is inconsistent with adopted local General Plans, and it does not meet the purpose and need of the HCP/NCCP permittees to achieve reasonable amounts of urban development and growth within their jurisdictions. This alternative would result in inconsistent and uncoordinated mitigation on a site-by-site basis. A likely outcome of this approach would be a patchwork of mitigation sites surrounded by development; such sites do not function well biologically.

Another alternative is to avoid all take from urban infrastructure projects outside the ULL. Rural transportation projects like the Vasco Road widening project have the potential to take vernal pool fairy shrimp or vernal pool tadpole shrimp if they fill or degrade seasonal wetlands. Such projects will be required to minimize their impacts on these species as described in Chapter 6. Requiring avoidance of all take of these species is not feasible because it may preclude the implementation of urban infrastructure projects outside the ULL and will therefore not meet the purpose and need of this Plan. Therefore, this alternative is rejected due to infeasibility.