

## APPENDIX E - WILDLIFE RESOURCES

### Special Status Species

Brief descriptions of the status, life history requirements, and habitat requirements for the special status species, except for American beaver which is a key resource species only, listed in Table 9-1 in Chapter 9 are presented below:

#### Mammals

##### *American Beaver* (key resource species only)

Beavers occur in streams, ponds, and lake margins, and are native to the Central Valley. Beavers are semiaquatic, requiring permanent water for reproduction and cover. Habitats include permanent, low-gradient water in rivers and streams, in open to moderately dense riparian forest.

Beavers forage on or near streambanks, felling trees and harvesting branches for winter food, which consists of bark and cambium of trees, specifically aspen, willow, alder, and cottonwood. Beavers also consume grasses, cattails, tules, and pond lilies. Beavers generally nest in burrows in stream banks of deep streams. In shallow streams, beavers build dams to create deep ponds for cover. Dams and lodges are typically constructed out of branches and mud. Beavers may also construct canals to feeding areas, providing cover while traveling.

Beavers may relocate, or move from place to place along a stream seeking an adequate supply of food, and young typically disperse up to six miles from their birth place. A beaver colony, which typically consists of an adult male and female, and two litters of young, will defend its territory against other colonies.

Beavers are common in suitable habitat throughout the area. Numerous beaver dams were observed in the study area including locations along Dutch Ravine, Auburn Ravine, Coon Creek, and the East Side Canal. Beavers are also commonly observed in irrigation ditches and canals (Brad Arnold, South Sutter Water District, pers. comm.)

Beavers are not a sensitive species, but were included as a potential key resource because of their potential to significantly affect riparian habitats. Beavers were once abundant in the Central Valley but populations were decimated by trapping. The species was subsequently reestablished, and introductions have extended the original range of the species. Although probably native to portions of the study area, beavers can become a nuisance and cause damage if the population becomes too large. Beaver dams may cause breaks in levees, flooding of roads or other structures, or interruption of irrigation supplies. However, beaver activities also enhance stream and wetland functions by introducing additional habitat diversity, expanding adjacent wetland areas, and trapping storm runoff, thereby extending stream flows during summer. Flooding caused by beaver dams may also help curtail the spread of Himalaya blackberry within the riparian zone.

*River Otter* (key resource species)

The river otter (*Lutra canadensis*) has no Federal or State status; it is a fully protected furbearer in California. This uncommon species occurs along streams and lake borders throughout most of Northern California and the Central Valley. Although primarily aquatic, otters will travel considerable distances over land to reach another stream or lake. River otters have been observed in most of the drainages in the western portion watersheds and in upper Coon Creek and Auburn Ravine.

The river otter is an uncommon, year round resident of rivers, marshes, and lakes throughout the much of Northern California and the Central Valley. Suitable habitat consists of riparian and other wetland vegetation associated with a permanent water source. Otters are semiaquatic; they require permanent water for reproduction, cover, and food. River otters are mostly carnivorous, feeding primarily on fish and crayfish; frogs, turtles, insects, and young birds are also consumed. River otters may travel up to 15 miles, following stream or lake margins, and movements of 50 to 60 miles in a year are not uncommon. They may also travel considerable distances overland during mating season.

Otters do not excavate burrows, but may enlarge those of other animals (e.g. beaver), and seek cover within thickets of riparian vegetation, tall wetland plants, hollow logs, stumps, and snags. Nesting site requirements include burrows and cavities in banks, trees, stumps, hollow logs, deserted beaver burrows, in thickets, and in platforms made of wetland plants.

River otters have been observed in Markham Ravine, west of Hwy SR 65 and at Aitken Ranch on Auburn Ravine west of Dowd Road. Otters have also been observed in irrigation canals in the western portion of the study area (Brad Arnold, South Sutter Water District, pers. comm.) It is likely that otters occur in low numbers in suitable habitat throughout the study area. Otters have also been observed in Auburn Ravine near Ophir and otter scat has been observed in Coon Creek near Garden Bar Road.

River otters are not considered a sensitive species, but are considered uncommon, and are protected from hunting or trapping in California. River otter populations were decimated by trapping, but numbers have increased under protection. The primary threat to this species is loss of suitable habitat. Other potential threats include unlawful hunting and trapping.

#### *Greater Western Mastiff Bat*

The greater western mastiff bat (*Eumops perotis californicus*) is a Federal species of concern and a CDFG species of special concern. This species occurs in a variety of arid to semi-arid habitats including grassland, chaparral, and deciduous woodlands, and is known to utilize trees as roost sites. This species has not been recorded in the study area, but could potentially occur since suitable roost trees are most likely present.

### *Small-footed Myotis Bat*

The small-footed myotis bat (*Myotis ciliolabrum*) is a Federal species of concern; it has no State status. This species has not been recorded in the study area. This species utilizes buildings as roost sites and could potentially occur in the project area.

### *Long-eared Myotis Bat*

The long-eared myotis bat (*Myotis evotis*) is a Federal species of concern; it has no State status. This species occurs in a wide variety of habitats to 9,000 feet elevation, but prefers coniferous woodlands and forests. Although not observed during previous surveys, the long-eared myotis bat may utilize buildings for nursery or roost sites and may occur in the project area.

### *Fringed Myotis Bat*

The fringed myotis bat (*Myotis thysanodes*) is a Federal species of concern; it has no State status. This species occurs in a wide variety of habitats and may utilize buildings as nursery or roost sites. Although not previously recorded in the study area, the fringed myotis bat may occur.

### *Yuma Myotis Bat*

The Yuma myotis bat (*Myotis yumanensis*) is a Federal species of concern and a CDFG species of special concern. This species occurs in open forests and woodlands, and its distribution is strongly tied to water sources. Although not previously recorded in the study area, buildings in the area may provide roost or nursery sites and this species could potentially occur.

### *Pale Big-eared Bat*

The pale big-eared bat (*Corynorhinus townsendii pallescens*) is a Federal species of concern and a CDFG species of special concern. This species occurs in a variety of habitats. Although not previously recorded in the study area, the pale big-eared bat could potentially occur in the area, as existing buildings could be utilized as roost sites.

### *Townsend's Western Big-eared Bat*

Townsend's western big-eared bat (*Corynorhinus townsendii townsendii*) is a Federal species of concern and a CDFG species of special concern. Although not previously recorded in the study area, Townsend's western big-eared bat may utilize buildings in the project area as roost sites, and consequently could potentially occur.

## Birds

### *Cooper's Hawk* (key resource species)

The Cooper's hawk (*Accipiter cooperii*) has no Federal status; it is a CDFG species of special concern. This species occurs in woodlands and generally nests in riparian communities. Cooper's hawks have been observed foraging in the study area and likely nests along the riparian corridors.

The Cooper's hawk is resident species found throughout most of the wooded portion of the state. Cooper's hawks inhabit dense stands of live oak, riparian deciduous, or other forest habitats near water. The species typically nests in deciduous riparian areas, near streams, and forages near open water or riparian vegetation. Specific habitat requirements may include broken woodlands with dense thickets and habitat edges for hunting. Cooper's hawks are seldom found in areas without dense tree stands or patchy woodland habitat.

Trees with a dense canopy are required for nesting. Small to medium size birds make up the majority of the Cooper's hawk diet. Cooper's hawks forage in the air, on the ground, and in vegetation.

The Cooper's hawk is considered rare and declining in portions of its range and is a CDFG Species of Special Concern. The primary threat to this species is loss of riparian habitat. Cooper's hawks are commonly observed in the study area; nests have been recorded at Chamberlain Ranch (Coon Creek just east of SR 65), and at Twelve Bridges Golf Course. Suitable habitat for Cooper's hawks occurs throughout the study area, but it most plentiful in the foothill areas. The primary threat to Cooper's hawks is loss of riparian habitat.

### *Sharp-shinned Hawk*

The sharp-shinned hawk (*Accipiter striatus*) has no Federal status; it is a CDFG species of special concern. This species breeds in coniferous and riparian deciduous forests, and prefers riparian areas. Sharp-shinned hawks have been observed foraging in the area. Suitable nesting habitat is also present in the area.

### *Swainson's Hawk* (key resource species)

The Swainson's hawk (*Buteo swainsoni*) has no Federal status; it is State listed as threatened. This species requires fields or grasslands for foraging and breeds in stands with few trees in juniper-sage flats, riparian areas and oak savannah. At least eight Swainson's hawks were observed in the Lincoln vicinity during a two-day survey in May, 1999. Swainson's hawk nesting habitat in the study area consists of taller trees along riparian corridors at lower elevations. Adjacent grasslands and fallow agricultural lands that are not planted in rice or orchards provide suitable foraging habitat.

The Swainson's hawk is an uncommon breeding resident and migrant occurring in the

Central Valley. Although formerly abundant in California with a wider breeding range, population declines have resulted in part from loss of nesting habitat.

Swainson's hawks breed in more or less open, riparian corridors. The birds nests on a platform of sticks, bark, and fresh leaves in a tree, or bush in areas of scattered trees or small groves near sparsely vegetated lands that are low gradient. Swainson's hawks forage in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures.

Swainson's hawk nests have been recorded on Coon Creek east of SR 65 (Chamberlain Ranch) and on the Cross Canal in the western portion of the study area. Swainson's hawks are probably limited to the lower watershed area where extensive grasslands occur adjacent to suitable nesting habitat. The primary threat to this species is loss of suitable habitat.

#### *Bank Swallow* (key resource species)

The bank swallow (*Riparia riparia*) was State listed as a threatened species in 1989; it has no federal status. The bank swallow is a neotropical migrant. In summer, the species resides exclusively in riparian and lacustrine areas with vertical banks, bluffs, and cliffs comprised of fine-textured or sandy soils, into which colonies of swallows dig nesting holes. The only confirmed records of bank swallows in the vicinity of the study area are from the Feather and Sacramento Rivers where suitable nesting habitat is available. There are no confirmed records of this species in Placer County. However, there may be areas of apparently suitable habitat on portions of Auburn Ravine and Coon Creek, and other drainages in these watersheds may provide appropriate habitat.

The bank swallow was State listed as a threatened species in 1989; it has no federal status. The bank swallow is a neotropical migrant found primarily in riparian and other lowland habitats in California. In summer, the species resides exclusively in riparian and lacustrine areas with vertical banks, bluffs, and cliffs comprised of fine-textured or sandy soils, into which colonies of swallows dig nesting holes. Bank swallows feed predominantly over open riparian areas. Cover is sought in nest holes, but the birds will also roost on logs, and shoreline vegetation.

Most of the remaining population of bank swallows in California nests along the upper Sacramento River where the river remains mostly natural. The only records of bank swallows in the vicinity of the study area are from the Feather and Sacramento Rivers where suitable nesting habitat is available. There are no confirmed records of this species in Placer County. There are anecdotal accounts of swallows nesting in banks along Auburn Ravine and Coon Creek; however, these sightings have not been confirmed, and rough-winged swallows, which are also bank nesters, have been confirmed in the study area. There may be areas of apparently suitable habitat for bank swallows on portions of Auburn Ravine and Coon Creek, and other drainages in the study area may provide appropriate habitat.

The primary threat to bank swallows is loss of suitable nesting habitat. Bank swallows require habitat consisting of eroding banks and bluffs. Much of this habitat has been eliminated by bank stabilization, levee construction, and other flood control practices.

#### *Tricolored Blackbird* (key resource species)

The tricolored blackbird (*Agelaius tricolor*) is a Federal species of concern and a CDFG species of special concern. This species nests colonially, usually in cattail and tule marshes, but is also known to nest in thistle and blackberry patches and other dense vegetation. Suitable nesting habitat (i.e., freshwater marsh, blackberry thickets) occurs in the study area. Tricolored blackbirds have been observed foraging and nesting in the western portion of the study area.

The tricolored blackbird is locally common throughout the Central Valley. Suitable habitat consists of protected nesting substrate (usually cattails or tules), a permanent water source, and adjacent foraging areas. The species breeds, nests, and roosts near fresh water, generally in emergent wetland with tall, dense cattails or tules; nesting has also been recorded in thickets of willow, blackberry, and wild rose. In spring and summer, tricolored blackbirds consume mostly insects and spiders, found in or near breeding habitats. In fall and winter, the birds feed in adjacent grassland and cropland habitats. Diets are comprised of seeds and cultivated grains, such as rice and oats, from foraging on ground in croplands, grassy fields, or flooded land.

Most tricolored blackbird records are from the Central Valley. Tricolored blackbirds are highly colonial; nesting areas must be large enough to support a minimum colony of about 50 pairs, and often nesting colonies are quite large (a colony of 10,000 birds was observed at Knight's Landing in 1969 and 1971). Nesting colonies have been recorded in the study area at Chamberlain Ranch and near the confluence of Orchard Creek and Ingram Slough. Tricolored blackbirds may also nest at appropriate habitat in the western portion of the study area. The primary threat to this species is loss of freshwater marsh habitat.

#### *Northern Harrier*

The northern harrier (*Circus cyaneus*) has no Federal status; it is a CDFG species of special concern. Suitable habitat for this species includes coastal salt marsh, fresh-water marsh, and open grassland, where it both forages and nests. Northern harriers have been observed foraging and nesting in the study area.

#### *White-tailed Kite*

The white-tailed kite (*Elanus leucurus*) has no Federal status; it is a CDFG fully protected species. This species occurs in open groves, river valleys, marshes, and grasslands. White-tailed kites have been observed foraging and nesting in the study area.

### *Double-crested Cormorant*

The double-crested cormorant (*Phalacrocorax auritus*) has no Federal status; it is a CDFG species of special concern. This species nests colonially on coastal cliffs and offshore islands, and along lake margins in the interior of the state. This species has been observed in the study area and suitable nesting habitat is available.

### *White-faced Ibis*

The white-faced ibis (*Plegadis chihi*) is a Federal species of concern and a CDFG species of special concern. This species occurs in freshwater marsh habitats. Although not previously recorded in the area, the white-faced ibis could utilize marsh habitat within the study area for breeding and/or foraging.

### *American Bittern*

The American bittern (*Botaurus lentiginosus*) is a Federal species of concern; it has no State status. It occurs in freshwater and slightly brackish marsh habitat, as well as coastal saltwater marsh. This species has been observed in the study area.

## Reptiles

### *Northwestern Pond Turtle* (key resource species)

The northwestern pond turtle (*Clemmys marmorata marmorata*) is a Federal species of concern and a CDFG species of special concern. This species occurs in permanent or nearly permanent bodies of water in a variety of habitats. Northwestern pond turtles have been observed in the study area.

The northwestern pond turtle is one of two subspecies of the western pond turtle that occurs from the Columbia River in Washington to Baja California. The two subspecies of western pond turtle intergrade over a relatively broad range in California. Pond turtles occur in a variety of aquatic habitats. The species is associated with permanent or nearly permanent water in a wide variety of habitat types including permanent ponds, streams, irrigation ditches, or permanent pools along intermittent streams. Pond turtles also require basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks.

Pond turtles are opportunistic feeders and will consume almost anything they can catch and overpower. Diets are primarily composed of slow moving aquatic insect larvae and carrion. Nest sites are usually excavated in a dry, exposed location at some distance (generally less than 600 feet) from aquatic habitat. Eggs are typically deposited in late spring to early summer. The young turtles hatch and overwinter in the nest, emerging and moving to the aquatic site in the spring. Turtle movements are not well understood. In ponds, movement away from the water may be rare, whereas turtles occupying stream habitats may nest or estivate close to the stream or move considerable distances away from the watercourse. Turtles are known to move distances greater than one mile if

habitat conditions become unfavorable.

Records of northwestern pond turtles in the study area include Coon Creek at Doty Ravine, Orchard Creek at Twelve Bridges Golf Course, and Penobscot Creek at SR 193. Suitable habitat occurs in most portions of the study area, and pond turtles likely occur elsewhere. The primary threats to northwestern pond turtles include loss of suitable habitat and introduction of nonnative predators (e.g., bullfrogs, catfish). Disturbance of upland nesting locations during incubation/overwintering may also threaten turtle populations.

#### *Giant Garter Snake* (key resource species)

The giant garter snake (GGS) (*Thamnophis gigas*) is a Federally and State threatened species. It occurs in freshwater marsh and low gradient streams and has adapted to similar habitat provided by drainage canals and irrigation ditches. GGS have been recorded at the extreme western end of the study area and there is suitable habitat elsewhere.

The GGS was State listed as a threatened species in 1971 and federally listed as a threatened species in 1993. It is endemic to the valley floor wetlands of the Sacramento and San Joaquin Valleys. GGS occur in freshwater marshes, sloughs, ponds, and low gradient streams, and have adapted to similar habitat provided by drainage canals and irrigation ditches in agricultural areas.

Historically, GGS apparently ranged from as far north as the Gridley area in Butte County, south to Buena Vista Lake in Kern County. The historic distribution of GGS generally coincides with the historic distribution of large flood basins, marshes, and tributary streams. Conversion of wetlands to agriculture and other uses eliminated much of the historic habitat for GGS. Current distribution follows the rice production zones of Glenn, Colusa, Butte, Sutter, and Sacramento Counties, south along the Yolo Bypass in Yolo County, and along the eastern portion of the Delta into San Joaquin County.

GGS occur in the immediate vicinity of permanent or semi-permanent sources of water, and require a permanent water source for reproduction, cover, and protection from predators. Habitat requirements for GGS include adequate water for cover and feeding during the snake's active period, from early spring through late fall; emergent vegetation for cover; grassy banks and openings in vegetation for basking; and uplands above flood elevation for refuge during the dormant period in winter. Egg laying occurs in secluded sites, under the loose bark of rotting logs or in dense vegetation near pond or stream margins.

The preferred nocturnal retreats of this diurnal snake are thought to be holes, especially mammal burrows, crevices, and surface objects. During the day, GGS will often bask on emergent vegetation such as cattails and tules; in hotter weather, mammal burrows, and piles of vegetation, adjacent to water source, may be used as daytime refuges. When disturbed the species will usually retreat rapidly to water.

Diet includes small fish, tadpoles, and frogs. The species is semiaquatic; foraging occurs primarily in and along streams where the snakes take fish and amphibians and amphibian larvae.

There are records for GGS in the study area, in Sutter County near Rio Oso. There are also records from the American Basin area in Sacramento County, and in the general vicinity of Sacramento International Airport. The majority of the recent records in the project vicinity are from irrigation canals and similar man-made features associated with agriculture.

Threats to GGS include continued loss of habitat, including artificial canal habitat, to residential and other development, water quality degradation, and predation by native and nonnative predators

### Amphibians

#### *Foothill Yellow-legged Frog* (key resource species)

The foothill yellow-legged frog (*Rana boylei*) is a Federal species of concern and a CDFG species of special concern. This species occurs in shallow, partly-shaded streams and riffles with rocky substrates. This frog prefers substrates that are at least cobble-sized and requires open areas where it can bask on rocks. The foothill yellow-legged frog is thought to be extinct in the Sacramento Valley but suitable habitat occurs in the foothill area and this species could potentially occur in the study area.

The foothill yellow-legged frog historically occurred in foothill portions of most northern California streams. The species is found in or near rocky streams in a variety of habitats, including, valley-foothill riparian. Suitable habitat consists of riparian and other wetland vegetation associated with a permanent water source. Permanent water is required for reproduction, cover, and food.

Foothill yellow-legged frogs are active throughout the year in the warmest localities, but may become inactive or hibernate in colder areas. Frogs may seek cover underground and beneath surface objects, under rocks in the streams or on shore within a few meters of water.

Egg clusters are attached to gravel or rocks in moving water near stream margins. Adults eat both aquatic and terrestrial invertebrates, and tadpoles probably graze on algae and diatoms along rocky stream bottoms. Adults often bask on exposed rock surfaces near streams; when disturbed, dive into water and take refuge under submerged rocks or sediments.

The status of the foothill yellow-legged frog in the study area is unclear. There are no records for the species from Placer County; however, suitable habitat exists for the frog and much of the suitable habitat has not been surveyed. Due to the long history of

disturbance to the riparian corridors and abundance of nonnative predators, it is unlikely that the foothill yellow-legged frog occurs in the study area. However, short of focused surveys of suitable habitat, the status of this species in the study area cannot be conclusively determined.

Threats to the foothill yellow-legged frog include loss and degradation of habitat, nonnative predators, increased numbers of native predators (e.g., raccoons), and water quality degradation.

#### *California Red-legged Frog* (key resource species)

The California red-legged frog (*Rana aurora draytonii*) is a Federally threatened species and a CDFG species of special concern. The red-legged frog inhabits lowlands and foothills in or near permanent sources of deep water. The frog prefers ponds or creeks with extensive shoreline vegetation but will disperse 1.6 km (1.0 mile) or more during and after rain events. This species has not been observed in the study area but suitable habitat is present.

The California red-legged frog was listed as a federally threatened species by the U. S. Fish and Wildlife Service on May 25, 1996. Currently, the California red-legged frog occurs in the central Coast Range from Marin and Lake Counties south to Ventura County. Isolated populations are known in Los Angeles, Riverside, El Dorado, and Tehama Counties. The species formerly ranged throughout the Central Valley and Sierra Nevada foothills from Shasta County to Kern County, but has been virtually eliminated from these areas. The California red-legged frog has suffered a 70 percent reduction in its geographical range as a result of several factors including habitat loss and alteration, overexploitation, and introduction of exotic predators (Jennings et al., 1992).

The closest known record for red-legged frogs, recorded in 1951 and again in 2001, is in the Michigan Bluff area, approximately 6.4 km (4.0 miles) east-northeast of Foresthill. A small population is also known from a single pond along Weber Creek near Placerville. Existing records indicate California red-legged frogs have not been observed in the Central Valley since 1957 and a breeding population has not been found since 1947 (Jennings et al., 1992). Per Jennings and Hayes (1994), California red-legged frogs are assumed extirpated from the Central Valley. In September, 2000, the U.S. Fish and Wildlife Service issued a proposed rule to designate critical habitat for the California red-legged frog. Portions of Yuba County to the north of the project area, and El Dorado County to the south, were proposed as critical habitat. No critical habitat was proposed within these watersheds.

The California red-legged frog is usually associated with marshes, streams, ponds, and other permanent sources of water. Intermittent streams provide suitable habitat if some surface water remains through the summer. Adults feed on aquatic and terrestrial insects and crustaceans and snails, as well as worms, fish, tadpoles, and smaller frogs. Breeding habitat is usually limited to ponds or stream pools that contain water through late summer (September) and support emergent vegetation such as tules, cattails, or spikerush for

concealment and attachment of eggs.

Red-legged frogs may estivate during the dry season in any habitat that provides cover and moisture within 300 feet of a riparian area (U.S. Fish and Wildlife Service, Determination of Threatened Status for the California Red-legged Frog, 1996). Telemetry studies suggest that frogs may disperse much greater distances, and that upland dispersal may be more common than dispersal along riparian corridors.

Similar to the foothill yellow-legged frog, the status of the California red-legged frog in the study area is unclear. There are no records for the species from Placer County; however, much of the suitable habitat has not been surveyed. As noted above, this species is assumed to be extirpated from the Central Valley. Due to the long history of disturbance to the riparian corridors and abundance of nonnative predators, it is unlikely that the California red-legged frog occurs in the study area. However, like the yellow-legged frog, short of focused surveys of suitable habitat, the status of this species in the study area cannot be conclusively determined.

Threats to the California red-legged frog are the same as for the foothill yellow-legged frog: loss and degradation of habitat, nonnative predators, increased numbers of native predators (e.g., raccoons), and water quality degradation.

#### Invertebrates

##### *Valley Elderberry Longhorn Beetle* (key resource species)

The valley elderberry longhorn beetle (VELB) (*Desmocerus californicus dimorphus*) is a Federally threatened species. It has no State status. This species ranges from Redding to Bakersfield, into the western foothills of the Sierra Nevada, and into the eastern foothills of the Coast Range. The larvae of the beetle feed and mature within the stems of elderberry plants (*Sambucus mexicana*) with a diameter of one inch or greater. VELB have been recorded in the western portion of the study area and could also occur elsewhere.

The VELB was listed as a federally threatened species by the U.S. Fish and Wildlife Service on August 8, 1980. This species ranges from Redding to Bakersfield, into the western foothills of the Sierra Nevada, and into the eastern foothills of the Coast Range. Two areas along the American River in the Sacramento metropolitan area have been designated as critical habitat for VELB. In addition, an area along Putah Creek in Solano County, and the area east of Nimbus Dam on the American River in Sacramento County, are identified as important habitat to the recovery of the species.

VELB are dependent on their host plant, elderberry, which is a common component of Central Valley riparian forests. VELB larvae feed and mature within elderberry stems one inch or larger in diameter, exiting prior to metamorphosing to the pupal stage (exit holes created by the larvae are generally the only evidence of beetle use). Because the larval beetles cannot be detected within the stems until the adults emerge, VELB are

typically assumed present within stems of sufficient size anywhere within the beetle's known range.

VELB appear to occur in population clusters, which are not evenly distributed across available habitat. Frequently, only particular plants or groups of plants are found to harbor the beetle. Plants used by VELB often show evidence of repeated use over many years.

The decline in VELB populations is directly related to the loss of riparian forests in the Central Valley that has occurred during the past 150 years. The range of the beetle has been reduced and its distribution fragmented. Similar losses have occurred to VELB in non-riparian habitat, i.e, high terrace woodlands and grasslands.

There are a number of recent records for VELB (i.e., positive identification of exit holes) in the project vicinity, including records from Roseville and Rocklin, and from the Bear River, immediately north of the study area. Within the study area, VELB have been recorded at Chamberlain Ranch (Coon Creek just east of SR 65), and at Twelve Bridges Golf Course. Threats to this species consist of further habitat loss, generally from development activities.

### **Management Concerns, Conflict Identification, and Summary of Findings**

This section provides a summary of the condition of the biological resources associated with the study area, identifies major problems, particularly in regard to key resources, and lists potential solutions that could be employed to improve and enhance biological resources.

From a plant communities perspective, the riparian corridors of the study are in a highly altered and moderately to severely degraded condition. Virtually all of the drainages have been affected to some degree by placer mining, harvesting of wood, water diversion and conveyance, agricultural practices, flood control, and/or development. The original plant communities that existed approximately 150 years ago have largely been replaced with communities that are, in most areas, less extensive, and less diverse both in terms of species richness and structural complexity. The natural dynamics (flooding and drought) that are characteristic of natural riparian corridors have been buffered both by channelization and other flood control practices and through addition of artificial summer flows to supply downstream irrigation water.

Despite the altered and degraded condition of the riparian corridors, they remain one of the most important and productive habitats for wildlife. Not only do riparian areas provide fundamental habitat elements (food, water, cover, breeding areas) required by all wildlife, they also provide linkages between different habitat types and corridors for movement and dispersal.

## Problems Identified

### *Himalayan Blackberry*

For the upper watershed area, the most significant problem identified is the domination of the riparian zone by Himalayan blackberry. Although many stream reaches support a well developed and diverse overstory, few areas were observed that were relatively free of blackberries. Those areas that were not infested were either the result of beaver dam impoundments, or vegetation management through mechanical control, grazing, or other means.

As noted previously, one of the most serious implications of riparian understory domination by Himalayan blackberry is the species' affect on regeneration of natives. Where streambank and floodplain areas are overgrown with masses of vegetation (e.g., blackberry thickets) the germination opportunity for native riparian trees is greatly reduced. Consequently, many of the area's riparian corridors lack sapling trees. The resulting lack of structural diversity directly affects wildlife diversity within the riparian corridor.

### *Narrowed Riparian Corridors*

In the lower watershed, Himalayan blackberry infestation appears to be less severe and more localized (perhaps due to more grazing or other alteration of the riparian zone). The most significant problem in this area is the artificial narrowing of the streams and associated riparian corridors, generally through channelization and construction of levees. Bottomland streams historically supported broad, meandering riparian corridors dominated by Valley oak, cottonwood and other species, and backwater areas supporting expansive freshwater marsh. Today, the lower reaches of most streams in the study area have been channelized to some extent, and the riparian corridor reduced to narrow stringers of trees. Most areas of freshwater marsh that remain are now artificial.

### *Other Potential Problems*

Other potential problems identified in the study area include an abundance of nonnative predators; lack of adequate buffers along stream corridors; overgrazing; artificial flows during summer; and water quality degradation.

### *Nonnative Predators*

Nonnative aquatic predators include bullfrogs, bass, catfish, mosquitofish, and crayfish. Bullfrogs, which eat virtually anything they can catch, can wreak havoc on populations of California red-legged frogs, foothill yellow-legged frogs, and northwestern pond turtles by consuming frog tadpoles and young turtles. The abundance of artificial ponds, irrigation ditches, and summer water in the study area provide ideal conditions for bullfrogs and other nonnative predators to thrive.

Feral domestic cats can have a significant impact on wildlife populations. Careful estimates place the number of free-ranging feral cats in North America at about 40

million (Coleman, Temple, and Craven, 1997). Research in Wisconsin indicates that rural free-ranging cats kill 39 million birds each year (Coleman and Temple, 1996). Nationwide, hundreds of millions of birds are killed each year by rural cats.

Recognizing the seriousness of this problem, the National Audubon Society Board of Directors adopted a resolution in 1997 regarding the cat issue. The resolution concludes that feral and free-ranging domestic cats are exceptional and prolific predators of small mammals, song birds, small reptiles, large amphibians, and large insects, predators; are proven to have serious negative impacts to bird populations; and have contributed to the decline of many bird species.

### *Inadequate Buffers*

In many portions of the study area, grazing, agricultural production, road construction, and development have occurred directly adjacent to the creeks. Many species, such as pond turtles and red-legged frogs, require upland areas adjacent to creeks for nesting, overwintering, or dispersal. Buffers also benefit species such as Cooper's hawks that tend to forage along habitat edges.

### *Overgrazing*

It is generally preferred to exclude cattle from riparian zones. Cattle can cause considerable damage to riparian habitats. Cattle consume new shoots and young saplings, trample vegetation, compact soils, accelerate bank erosion, and contribute pollutants to streams. These problems are aggravated if cattle become too numerous or forage is inadequate.

### *Summer Flows*

The abundance of water during summer in many of the study area's streams creates a paradox for biological resources. Conditions for some species are improved and most riparian vegetation thrives with summer irrigation. However, a consistent supply of summer water year after year is not a natural condition within the study area, and certain problems, including the abundance of nonnative predators and Himalayan blackberry, may be aggravated by this condition.

### *Effects to Key Resources*

Most species that occur along the streams within the study area have been affected to some degree by the alteration and degradation of the riparian zones. The problems identified above directly affect the status of key resources in the study area, as discussed below.

The channelization of drainages in the lower watershed and loss of riparian habitat has adversely affected the American beaver, but has not eliminated this species from the study area. In fact, the beaver is one species that may have benefitted from additional summer flows, allowing the species to move further into foothill areas. Irrigation canals

and ditches have also provided additional habitat for beavers.

River otters were probably never common in the study area, as they are generally associated with larger streams. Recent records for the species are all from the lower watershed. Like the beaver, river otters may have benefitted from additional summer flows, allowing the species to move further into foothill areas. Irrigation canals and ditches have also provided additional habitat for river otters.

Cooper's hawks are closely associated with riparian corridors. The degraded condition of the riparian corridors in the upper watershed, including loss of native understory vegetation and inadequate buffers, may directly affect the suitability of these areas for Cooper's hawks. Certainly the elimination of trees and narrowing of the riparian zones in the lower watershed has reduced the suitability of this area for Cooper's hawks.

Swainson's hawks are primarily associated with the eastern portion of the lower watershed (in the vicinity of Lincoln) where open fields and row crops for foraging are adjacent to suitable nesting habitat along riparian corridors. The elimination of trees and narrowing of riparian corridors reduces the potential for nesting even though ample foraging opportunities may exist in this area. Further west, the abundance of rice fields makes this portion of the study area less suitable for foraging by Swainson's hawks.

Bank swallows have very specific habitat requirements (sandy, vertical bluffs or banks) that have limited occurrence in the study area. Most bank swallow activity is associated with larger river systems, primarily, the upper Sacramento River. The primary threat to this species is bank protection projects. It is not known whether suitable habitat for bank swallows was previously more extensive in the study area.

Much of the historic habitat for GGS has been lost; however, this species has been able to adapt to the artificial habitat provided by irrigation canals and ditches, and flooded rice fields. In fact, the current distribution of GGS follows the rice production zone of the Valley.

Although not common, suitable habitat is present for northwestern pond turtle, and the species continues to occur in the study area. Riparian habitat loss and degradation, including narrowing of riparian corridors, elimination of sloughs and other backwater areas, overgrazing, and lack of adequate upland buffers adjacent to riparian corridors, have adversely affected this species.

The elimination of the California red-legged frog and foothill yellow-legged frog from the Central Valley occurred as a result of overexploitation, habitat loss and degradation, and the introduction of nonnative predators. Although suitable habitat for both species occurs in the foothills, the degraded nature of the riparian corridors and abundant predators may have eliminated these species here as well. Amphibian species are especially sensitive to pollutants, even at very low levels. Runoff from developed areas and roadways, and discharges of treated sewage effluent into the streams in the study area, further reduce the potential for these species to occur.

The reduction in VELB populations has been linked to loss of riparian habitat. Again, the narrowing of the riparian zone in the lower watershed has likely had an adverse affect on this species. Since elderberry plants tend to grow along the outer fringes of the riparian zone, where flooding is less frequent, suitable habitat for this species has often been converted to other uses.

## **Solutions**

Simply stated, there are two solutions that will alleviate most of the problems affecting key resources, as well as other biological resources, in the study area: control Himalayan blackberry and widen the riparian corridors. These two objectives should be central to any programmatic management plan for the study area, and can be achieved on a project specific basis. Accomplishing these objectives will directly benefit the river otter, Cooper's hawk, Swainson's hawk, northwestern pond turtle, and VELB, and may reduce nuisance problems caused by beavers. The tricolored blackbird and GGS may also benefit from riparian corridor widening and enhancement in the lower watershed, particularly if enhancement includes the provision for additional backwater and marsh habitat.

Problems facing the red-legged and foothill yellow-legged frogs are more complex, and it is unknown whether either species occurs in the study area. Certainly the two objectives stated above, as well as predator control, increased buffers, and water quality improvement measures, would benefit these species if they are present.

The project area probably does not provide significant habitat for bank swallows, and there is no specific solution to benefit this species that could be easily implemented. If suitable habitat is identified, efforts should be initiated to protect it, including measures to eliminate the need for any bank stabilization activities.

### Control of Himalayan Blackberry

Projects to control Himalayan blackberry could be implemented virtually anywhere in the study area where the plant occurs, but would be most beneficial in the upper watershed. Projects should include four critical elements: initial removal of Himalayan blackberry; follow-up control to prevent reinvasion; reestablishment of native riparian species; and long term management.

There has been considerable research and experimentation on control methods for Himalayan blackberry. Much of this work has been conducted in the Northwest and Northeast, where wetter climates allow this species to become established well beyond the riparian zone.

A variety of mechanical, chemical, and biological methods have been employed for initial control and long term management of Himalayan blackberry. Mechanical removal or burning may be the most effective means of initial removal of mature plants.

Regardless of the method of initial removal, follow-up treatment is necessary to prevent recolonization. This may include use of herbicides, grazing, or planting fast growing native riparian species that can shade out the blackberry.

In a study of the effects of grazing by various livestock on Himalayan blackberry, Amor (1974) found that in ungrazed areas, 96 percent of blackberry plants produced daughter plants; this was reduced to 11 percent in areas grazed by horses, and 1 percent in areas grazed by cattle. No daughter plants were produced in areas grazed by sheep.

Grazing with goats contained by electrified enclosures has shown to be effective in controlling unwanted brush (Hoshovsky, 1989). Angora goats prefer woody vegetation over most grasses or forbs. Initial removal of blackberry canes is required, as goats will not consume highly woody growth. Also, goats are nonselective, and will eat anything available to them. This may not be a problem within the study area, as it appears there is little desirable vegetation in areas dominated by blackberries.

Himalayan blackberry is conspicuously absent from floodplain areas flooded by beaver dams. Temporary flooding through construction of small dams may be another means of controlling this species.

#### Riparian Restoration/Enhancement

No attempt is made here to differentiate between riparian restoration and enhancement measures. Although strictly speaking, there are important distinctions between restoration and enhancement, these distinctions are not particularly important in the context of this project. In this report, these terms have been combined and applied to any efforts undertaken to improve the quality of riparian habitats.

#### *Restoration/Enhancement of Existing Benches and Floodplains*

Portions of the riparian zone along creeks in the study area have been converted to grazing areas or are routinely planted with various crops, but remain within the active floodplain, as indicated by topographic position and recent fluvial deposits. These areas, which include fields at the outer edge of extant riparian vegetation, areas between channel braids, and benches within channel banks, can be readily restored to riparian habitat through planting with native riparian species. The cost and level of effort necessary to accomplish riparian restoration/enhancement in these areas is relatively low and the potential for success is high. Elderberry plants can be included in the revegetation palette to provide potential habitat for VELB.

#### *Restoration/Enhancement of Former Floodplain Areas*

In other areas, particularly where creeks have been channelized, portions of the riparian zone have been physically separated from the active floodplain by berms or levees. Restoration of these areas represents a greater challenge, as both physical alteration of the creek and revegetation are necessary for enhancement. However, these riparian areas are

the most highly degraded and will benefit most from implementation of restoration/enhancement measures. Areas where this approach would be most effective are in the western end of the study area, primarily within Sutter County.

### Solutions to Other Watershed Problems

#### *Nonnative Predators*

It is exceedingly difficult to control most nonnative predators once established. Control may be feasible only for selected areas (e.g., known locations of pond turtles) where the efforts would be most productive. Educating the public on the sensitivity of certain species and the problems caused by these predators would also be beneficial. This is especially true for feral and domestic cats.

#### *Inadequate Buffers*

Buffers between the riparian zone and adjacent land uses should be widened wherever possible. This can be accomplished by fencing cattle out of riparian areas, leaving fallow fields along creeks, relocating outbuildings and other temporary structures away from the riparian zone, and similar measures. Adequate buffer width is dependant on the adjacent land uses. A minimum 50 foot buffer should be provided along all riparian areas; wider buffers (up to 250 feet or more) are preferable.

#### *Overgrazing*

As noted above, cattle grazing in riparian areas should be discouraged. If access to water is necessary, access points should be limited to specific areas. Moderate grazing, if carefully managed, may be acceptable in some riparian areas, and may be necessary in some areas to control Himalayan blackberry. Grazing by goats, sheep, or other livestock may also be appropriate. All grazing activities within and adjacent to riparian corridors, as well as the overall condition of grazed areas, need to be closely monitored.

#### *Summer Flows*

If possible, and not contradictory to other plan objectives, discharges should be managed to allow some stream reaches to convey only natural flows during summer and fall for one, or perhaps several, seasons. This could be done on a rotating basis involving several stream reaches, and perhaps in conjunction with Himalayan blackberry management or other riparian enhancements.