

Chapter 13

Wildlife Resources

13.1 Affected Environment

This section describes the affected environment related to wildlife resources, including special-status species, for the dam and reservoir modifications proposed under SLWRI action alternatives. For a more in-depth description, see the *Wildlife Resources Technical Report*.

Shasta Dam and Shasta Lake are located on the upper Sacramento River in Northern California. Shasta Dam is located approximately 9 miles northwest of Redding, and the dam and entire reservoir are located in Shasta County. Elevations in the Shasta Lake vicinity portion of the primary study area range between approximately 1,070 and 1,200 feet, and the terrain is moderate to steep.

The wildlife resources setting for the Shasta Lake and vicinity portion of the primary study area consists of the impoundment area (five arms and the main body of Shasta Lake) and the relocation areas (Figure 13-1). The Shasta Lake and vicinity portion of the primary study area is composed of Shasta Dam and Shasta Lake and the lower reaches of the tributaries draining into Shasta Lake.

Reclamation established project boundaries for focused surveys in the area that would be subject to inundation under various enlargement scenarios. The lower boundary corresponds to the current full-pool elevation defined by Reclamation (1,070-foot mean sea level (msl) contour line). The upper boundary was established using the 1,090-foot msl contour line around the entire lake. This area is hereafter referred to as the “impoundment area” (Figure 13-1).

To examine the physical and biological resources along riverine habitats that would be subject to inundation if Shasta Dam were enlarged, reaches of 11 streams and rivers that are tributary to Shasta Lake were also incorporated into the Shasta Lake and vicinity portion of the primary study area. These streams were selected by Reclamation in conjunction with USFS as an initial sampling of streams representative of riverine and riparian habitats.

Areas subject to physical disturbance as an indirect result of the proposed project (i.e., areas proposed as relocation sites for roadways, bridges, utilities, and campgrounds that would be inundated subsequent to the enlargement of Shasta Dam as well as proposed dike locations) were incorporated into the

Shasta Lake and vicinity portion of the primary study area. These locations are hereafter referred to as “relocation areas” (Figure 13-1).

In addition to the areas subject to inundation and/or relocation, Reclamation has identified six locations considered for river restoration. These six locations are referred to as the potential Sacramento River downstream habitat restoration areas (Figure 13-2).

For the purposes of this investigation, approximate acreages for habitat types are reported by arm of the lake. For a relocation area that falls between two arms, the area is included with the arm that has the most acreage of the vegetation type or water of the United States.

Descriptions of biological resources were derived primarily from the following sources:

- SLWRI Mission Statement Milestone Report (Reclamation 2003)
- SLWRI Initial Alternatives Information Report (Reclamation 2004)
- Chapter 3, “Biological Environment,” in the Draft SLWRI Plan Formulation Report (Reclamation 2007)
- USFWS Endangered Species Lists
- California Natural Diversity Database (CNDDDB)
- Numerous technical studies of botanical, wetland, and wildlife resources conducted by Reclamation in the Shasta Lake and vicinity portion of the primary study area since 2002.

Several attachments to the *Wildlife Resources Technical Report* provide detailed lists and descriptions of special-status wildlife species present in the primary and extended study areas:

- Attachment 1, Special-Status Wildlife Species Potentially Occurring in the Shasta Lake and Vicinity Portion of the Primary Study Area
- Attachment 2, Species Accounts for Special-Status Wildlife in the Shasta Lake and Vicinity Portion of the Primary Study Area
- Attachment 3, Breeding Bird Surveys 2007-2013
- Attachment 4, Species Accounts for Special-Status Wildlife in the Primary Study Area Downstream from Shasta Dam
- Attachment 5, Federal Lists of Special-Status Wildlife Species in the Vicinity of the Primary Study Area

- Attachment 6, Special-Status Wildlife Species with Potential to Occur in the Primary and Extended Study Areas by Area
- Attachment 7, List of All Sensitive Wildlife Species in the Extended Study Area Reported to the CNDDDB
- Attachment 8, Forest Carnivore Survey Report
- Attachment 9, Shasta Salamander Survey Report
- Attachment 10, Terrestrial Mollusk Survey Report
- Attachment 11, California Red-legged Frog Habitat Assessment Reports, Shasta Lake and Vicinity Portion of the Primary Study Area
- Attachment 12, Biological Characterizations, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Henderson Open Space
- Attachment 13, Biological Characterizations, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Tobiasson Island
- Attachment 14, Biological Characterizations, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Shea Island Complex
- Attachment 15, Biological Characterizations, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Kapusta Island
- Attachment 16, Biological Characterizations, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Anderson River Park
- Attachment 17, Biological Characterizations, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Reading Island
- Attachment 18, California Red-legged Frog Habitat Assessment, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Henderson Open Space
- Attachment 19, California Red-legged Frog Habitat Assessment, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Tobiasson Island

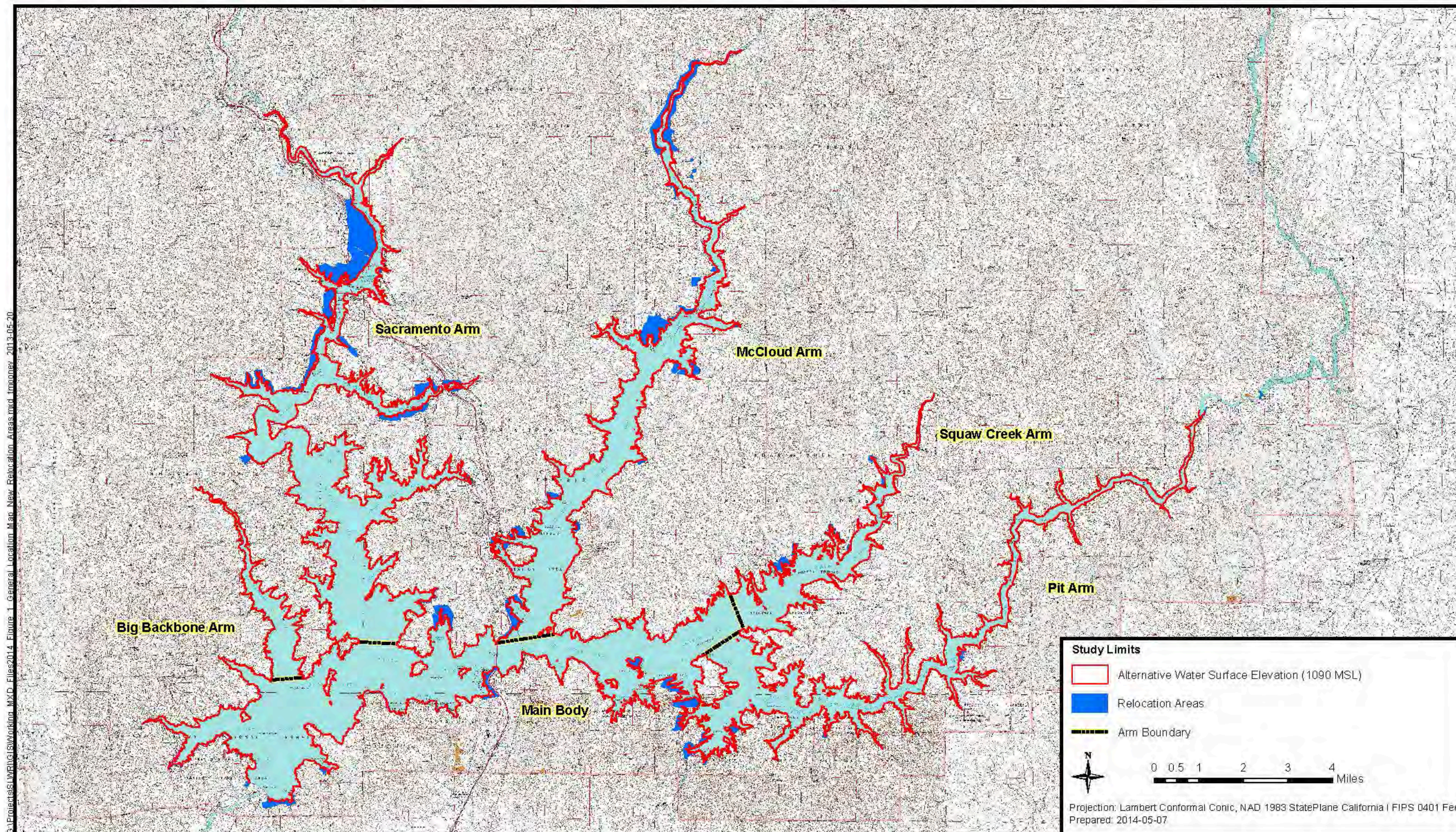
- Attachment 20, California Red-legged Frog Habitat Assessment, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Shea Island Complex
- Attachment 21, California Red-legged Frog Habitat Assessment, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Kapusta Island
- Attachment 22, California Red-legged Frog Habitat Assessment, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Anderson River Park
- Attachment 23, California Red-legged Frog Habitat Assessment, SLWRI Potential Sacramento River Downstream Habitat Restoration Areas: Reading Island

13.1.1 Wildlife

Shasta Lake and Vicinity

Wildlife resources described in this chapter result from the wealth and diversity of climatic and vegetative associations in and adjacent to the Shasta Lake and vicinity portion of the primary study area. Influences from the southeastern Klamath Mountains, Coast Ranges, the southern Cascade Range, the northern Sierra Nevada, the Great Basin, and the Central Valley provide for a unique mix of biota. Much of this region, especially in the Central Valley, has been modified by past and present land uses.

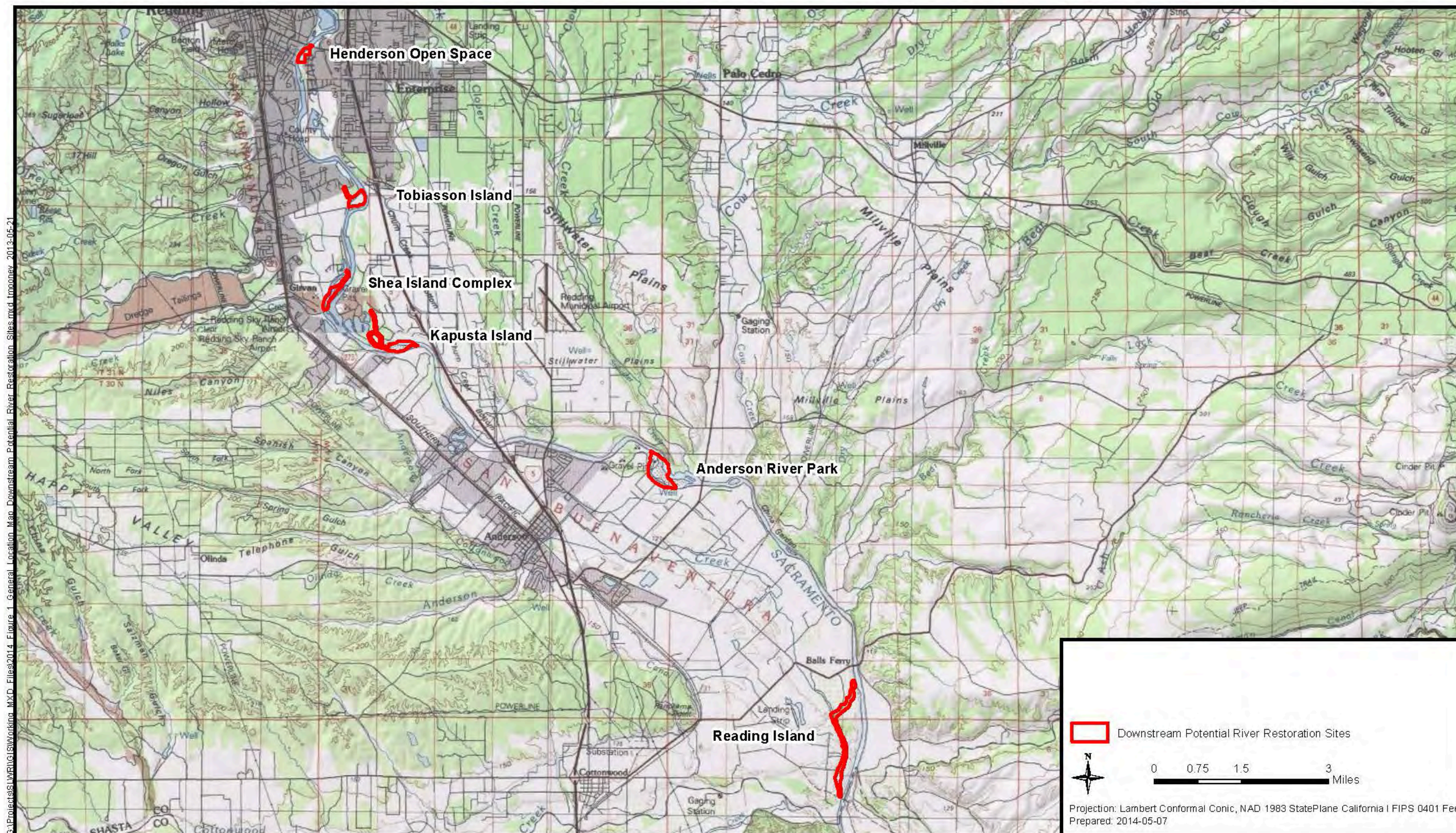
Wildlife Habitats The Shasta Lake and vicinity portion of the primary study area is characterized by a variety of habitats typical of mixed woodlands and low-elevation forests found in the southeastern Klamath Mountains. These habitats were mapped and classified using the *Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988). Habitats present in the Shasta Lake and vicinity portion of the primary study area are summarized in Tables 13-1 and 13-2, and depicted in Figures 13-3a through 13-3f. General habitat descriptions, including typically occurring wildlife species, are described below. Plant taxonomy follows Baldwin et al. (2012).



Key: MSL = feet above mean sea level

Figure 13-1. Study Limits

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Figure 13-2. General Location Map Downstream Potential River Restoration Areas

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Table 13-1. Summary of Wildlife Habitats in the Impoundment Area

Habitat	Area (Acres ¹)						Total
	Main Body	Big Backbone Arm	Sacramento Arm	McCloud Arm	Squaw Creek Arm	Pit Arm	
Annual grassland	0.44	0.00	3.10	0.70	0.00	0.38	4.61
Barren	2.30	0.00	10.60	3.56	0.00	1.35	17.81
Blue oak–foothill pine	10.36	0.00	0.00	0.00	4.29	32.33	46.98
Blue oak woodland	0.00	0.00	0.00	0.00	0.00	4.18	4.18
Closed-cone pine–cypress	32.68	0.00	12.95	20.89	44.72	70.52	181.77
Douglas-fir	0.00	0.00	0.00	0.36	0.00	0.00	0.36
Klamath Mixed Conifer	0.00	0.00	0.00	0.00	0.00	10.96	10.96
Mixed chaparral	29.19	13.64	161.04	15.14	10.35	12.99	242.36
Montane hardwood	73.49	38.76	171.01	70.37	19.43	78.84	451.91
Montane hardwood–conifer	70.68	0.99	150.42	136.54	111.63	179.48	649.76
Montane riparian	4.16	6.67	26.16	13.91	1.53	5.52	57.94
Ponderosa pine	215.11	30.72	188.19	161.64	49.56	122.07	767.30
Riverine	0.00	0.88	5.24	15.43	1.41	0.00	22.96
Urban	21.95	0.00	1.95	7.96	0.00	1.26	33.14
Total	460.37	91.67	730.72	446.49	242.92	519.90	2492.07

Note:

¹Acreage values are approximate.

Table 13-2. Summary of Wildlife Habitats in the Relocation Areas

Habitat	Area (Acres ¹)						Total
	Main Body	Big Backbone Arm	Sacramento Arm	McCloud Arm	Squaw Creek Arm	Pit Arm	
Annual grassland	4.79	0.00	26.46	9.75	0.84	0.23	42.07
Barren	22.37	0.00	72.18	29.71	11.53	12.06	147.86
Blue oak–foothill pine	1.91	0.00	0.00	0.00	0.00	7.24	9.16
Blue oak woodland	0.00	0.00	0.00	3.68	0.00	0.92	4.59
Closed-cone pine–cypress	0.11	0.00	41.98	9.63	1.94	12.50	66.15
Douglas-fir	0.00	0.00	0.00	3.02	0.00	0.00	3.02
Mixed chaparral	12.65	0.00	56.11	26.92	4.44	33.98	134.11
Montane hardwood	35.81	0.00	137.77	148.13	6.34	0.13	328.17
Montane hardwood–conifer	104.31	0.00	117.35	221.40	29.04	30.09	502.19
Montane riparian	0.34	0.00	1.35	3.08	0.23	0.02	5.02
Ponderosa pine	156.24	0.00	398.26	272.10	43.08	22.09	891.77
Riverine	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Urban	20.66	0.00	228.60	0.48	0.00	0.57	250.30
Total	359.20	0.00	1080.05	727.90	97.44	119.83	2384.42

Note:

¹ Acreage values are approximate.

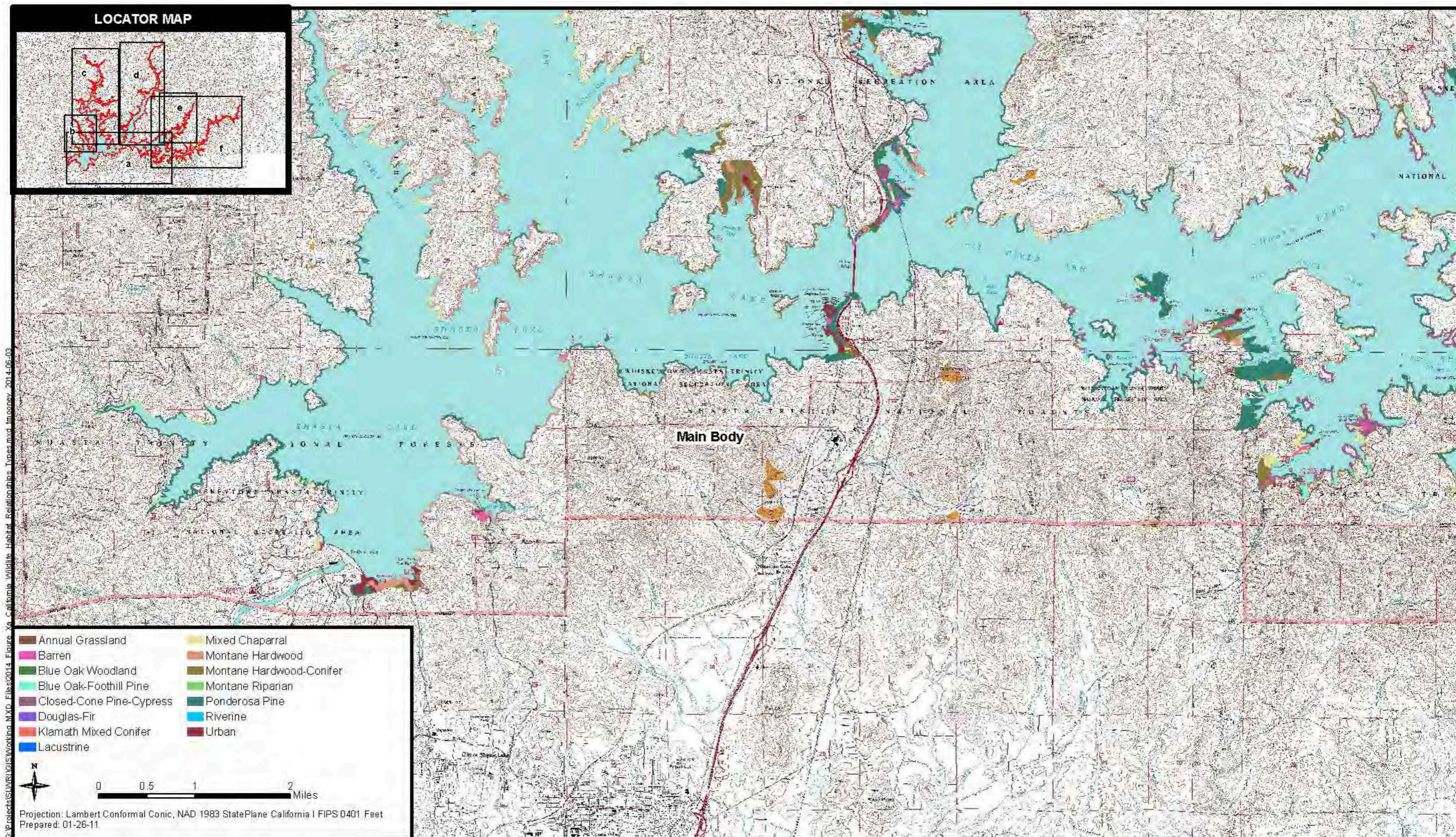


Figure 13-3a. California Wildlife Habitat Relationship Types

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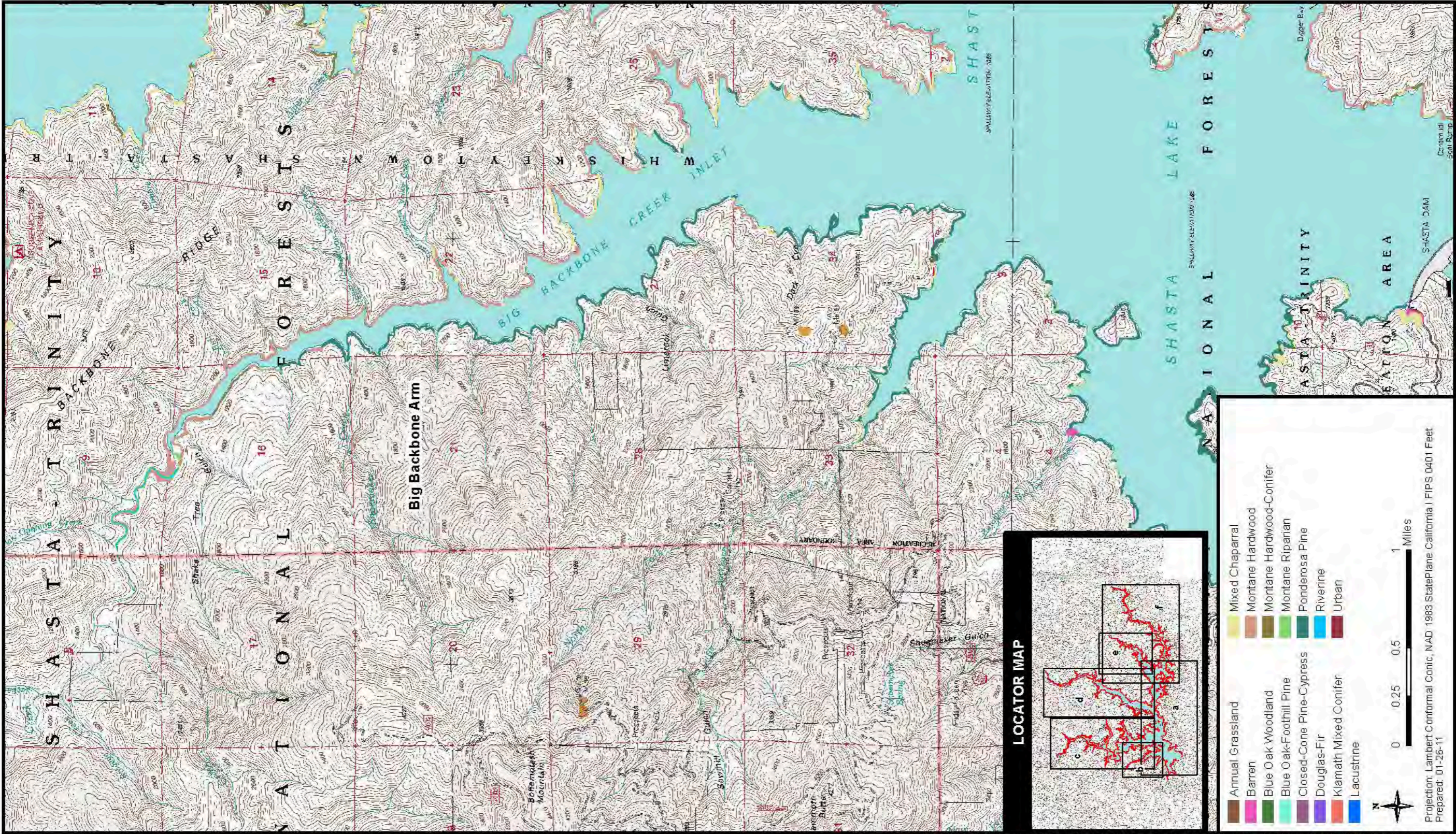


Figure 13-3b. California Wildlife Habitat Relationship Types

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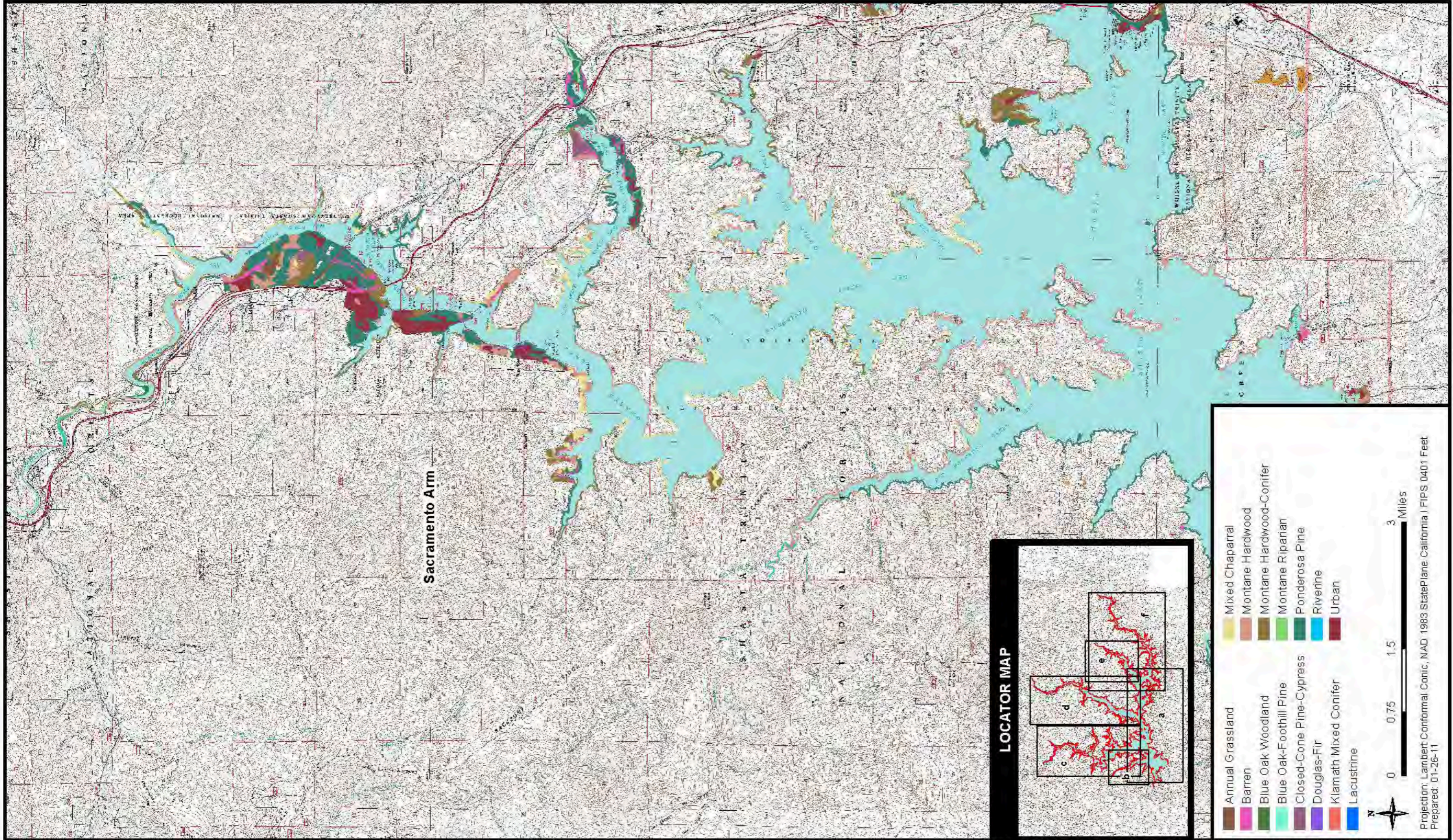


Figure 13-3c. California Wildlife Habitat Relationship Types

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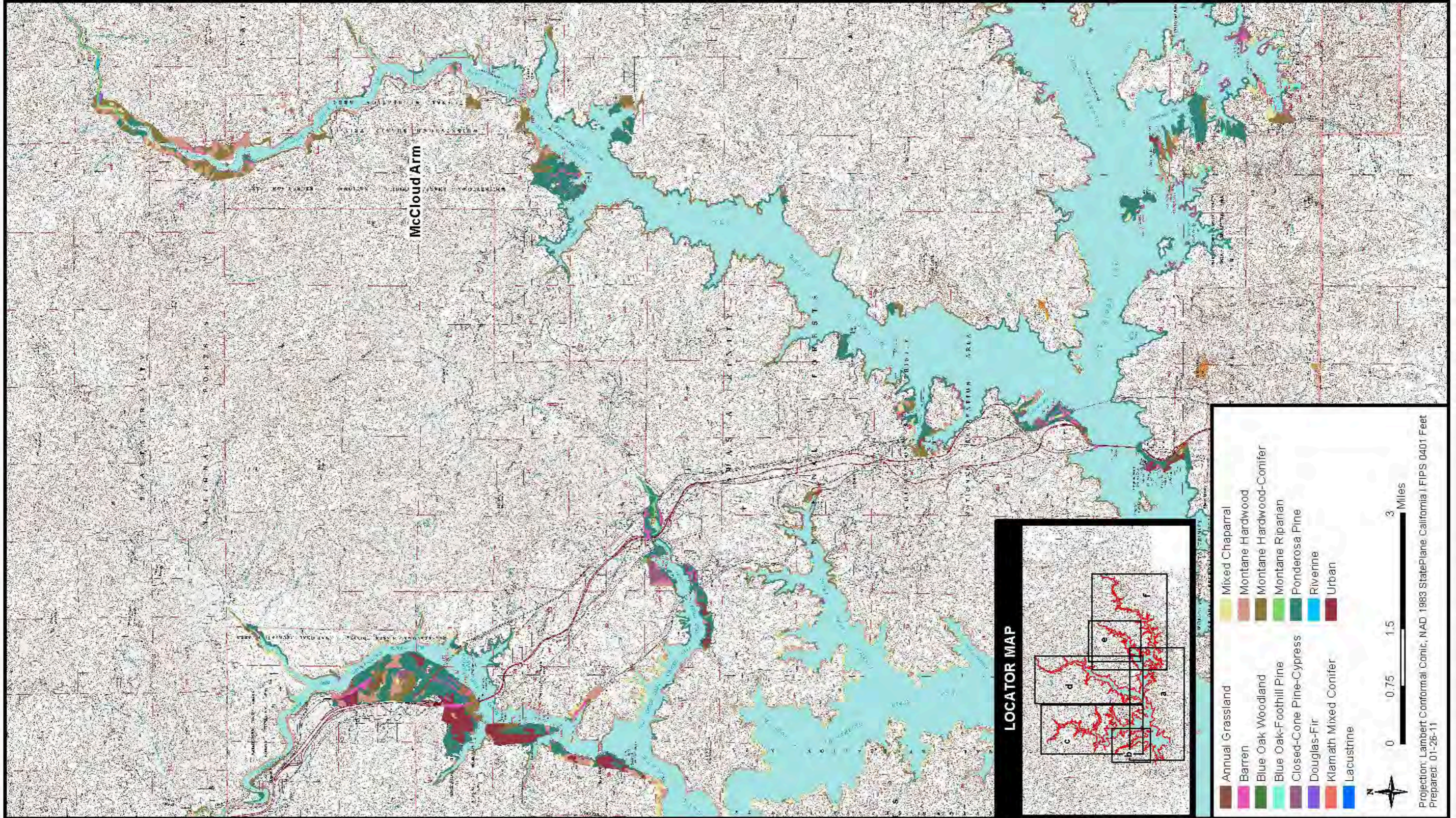


Figure 13-3d. California Wildlife Habitat Relationship Types

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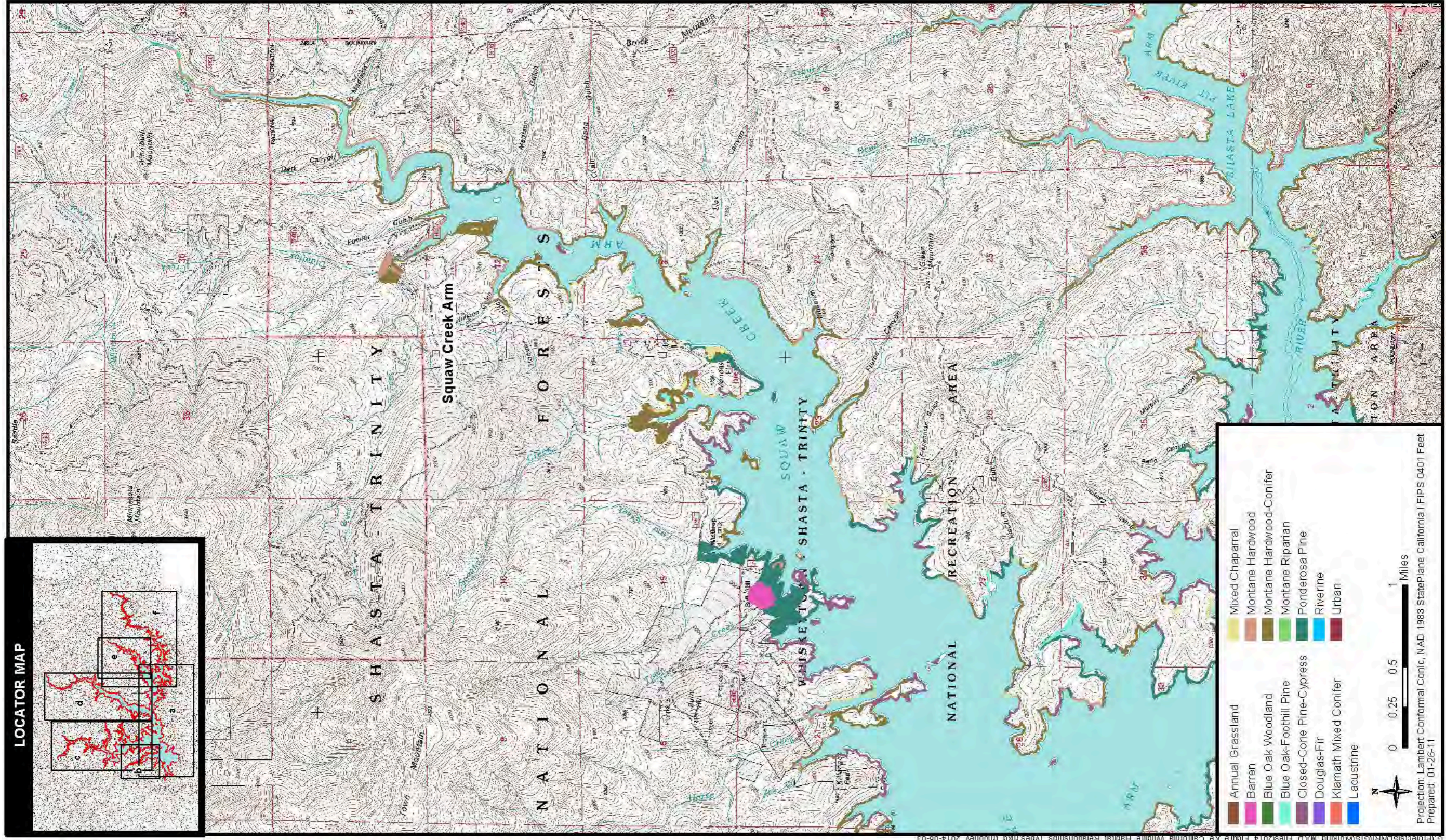


Figure 13-3e. California Wildlife Habitat Relationship Types

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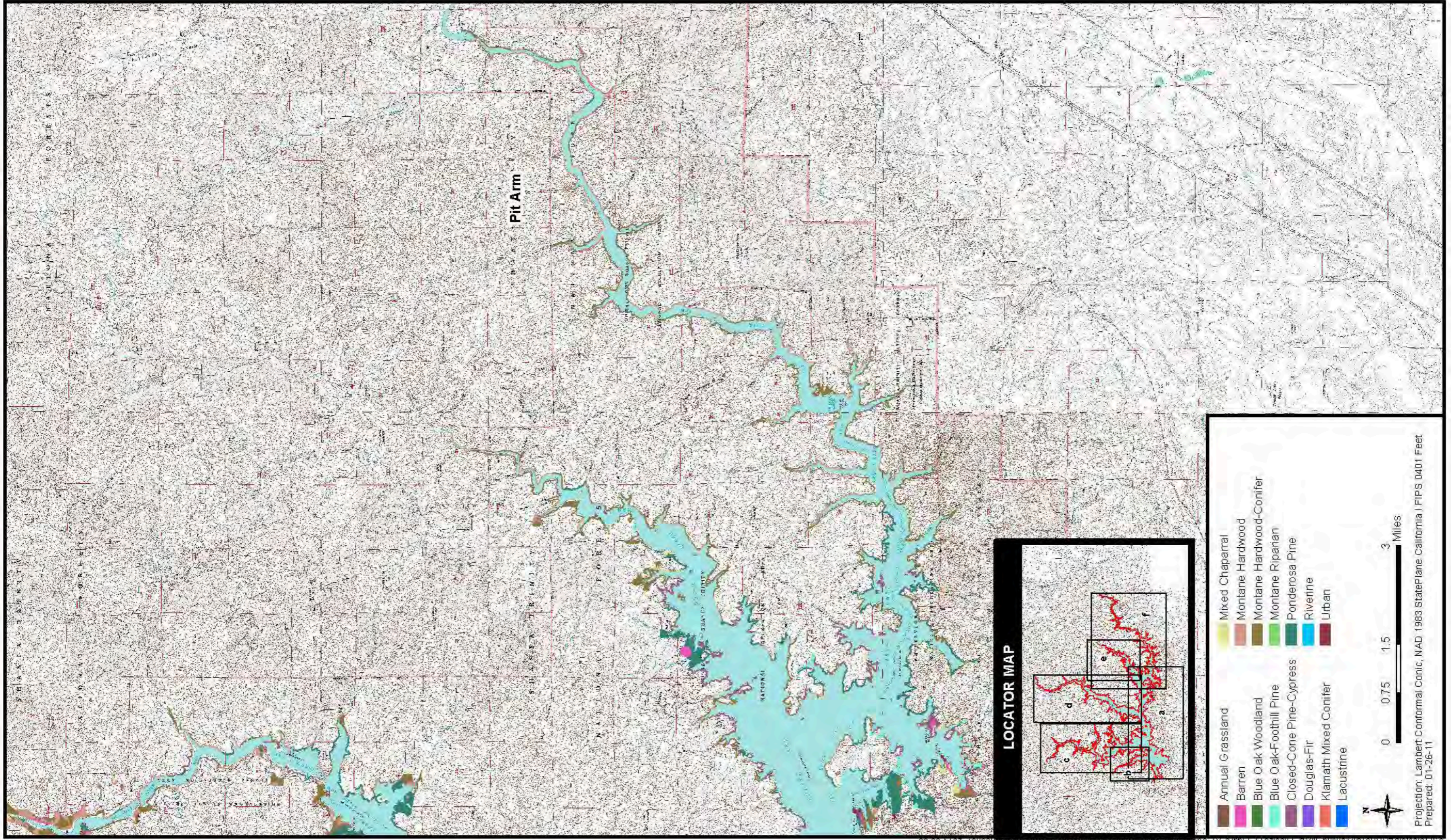


Figure 13-3f. California Wildlife Habitat Relationship Types

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Annual Grassland Annual grassland is uncommon in the Shasta Lake and vicinity portion of the primary study area and occurs as small inclusions in other more prevalent plant series types or in areas subjected to previous disturbance. Dominant species include wild oat (*Avena fatua*), cheatgrass (*Bromus tectorum*), ripgut (*B. diandrus*), yellow star-thistle (*Centaurea solstitialis*), squirreltail (*Elymus elymoides*), and European hairgrass (*Aira caryophylla*). Grassland bird species, such as the mourning dove (*Zenaida macroura*), savannah sparrow (*Passerculus sandwichensis*), and white-crowned sparrow (*Zonotrichia leucophrys*), as well as rodents, such as the California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), and deer mouse (*Peromyscus maniculatus*), may forage on the seed crop this community provides. These species, in turn, attract predators, such as the gopher snake (*Pituophis melanoleucus*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), and coyote. Reptile species expected to inhabit this area include the western fence lizard (*Sceloporus occidentalis*), western skink (*Eumeces skiltonianus*), western rattlesnake (*Crotalus viridis*), and yellow-bellied racer (*Coluber constrictor*).

Barren Barren habitat consists mainly of human-made features without vegetation scattered throughout the Shasta Lake and vicinity portion of the primary study area, including boat ramps, parking lots, and roads. Other barren habitats include a large gravel plain feature at the confluence of Butcher Creek and Shasta Lake (Main Body) and a sealed riprap feature adjacent to Interstate 5 near the upper Sacramento Arm and Shasta Lake confluence. Vegetation is usually not present, although a sparse cover of grasses/forbs or weedy species may be present. Barren habitat has limited value for wildlife; however, many species in adjacent habitats may use these areas occasionally as opportunities arise, such as for feeding. Also, open nesting species, such as killdeer (*Charadrius vociferus*), may use some barren surfaces for nesting.

Blue Oak Woodland Blue oak woodland occurs mainly as small inclusions within other more prevalent habitats; however, moderate-sized stands also occur. This habitat occurs at scattered locations along the Main Body, McCloud Arm, and Pit Arm. Blue oak woodland is characterized by a moderate overstory of blue oak (*Quercus douglasii*) with a dense herbaceous understory. Oak woodlands produce acorns used as forage by a variety of species, including acorn woodpeckers (*Melanerpes formicivorus*), western scrub-jays (*Aphelocoma californica*), turkey (*Meleagris gallopavo*), western gray squirrels (*Sciurus griseus*), and black-tailed deer (*Odocoileus hemionus columbianus*). Snags and live trees containing cavities provide nesting habitat for species such as the western bluebird (*Sialia mexicana*), tree swallow (*Tachycineta bicolor*), American kestrel, and northern flicker (*Colaptes auratus*), as well as roost sites for bats and denning sites for mammals, such as the raccoon, Virginia opossum (*Didelphis virginiana*), and gray fox (*Urocyon cinereoargenteus*). Raptors, including the red-tailed hawk and great horned owl, also nest in these woodlands. Amphibian and reptile species found here include the Pacific chorus frog (*Pseudacris regilla*), bullfrog (*Rana catesbeiana*), western fence lizard,

southern alligator lizard (*Elgaria multicarinata*), western terrestrial garter snake (*Thamnophis elegans*), common garter snake (*Thamnophis sirtalis*), and western rattlesnake.

Blue Oak–Foothill Pine Blue oak–foothill pine habitat also occurs mainly as small inclusions within other more prevalent habitats in the Shasta Lake and vicinity portion of the primary study area; however, moderate-sized stands also occur. This habitat is found in the Main Body, Squaw Creek Arm, and Pit Arm. Species composition is similar to the blue oak woodland habitat; however, gray pine and a shrub component are more common. Dominant overstory species include blue oak, California black oak (*Quercus kelloggii*), valley oak (*Quercus lobata*), interior live oak (*Quercus wislizenii*), and gray pine (*Pinus sabiniana*). Common shrubs observed in this habitat include white leaf manzanita (*Arctostaphylos viscida*), buck brush (*Ceanothus cuneatus*), poison oak (*Toxicodendron diversilobum*), coffee berry (*Frangula californica*), snowdrop bush (*Styrax officinalis*), wild mock orange (*Philadelphus lewisii*), deer brush (*Ceanothus integerrimus*), and California buckeye (*Aesculus californica*). Common grasses and forbs observed in this vegetation habitat include pussy ears (*Calochortus tolmiei*), Pacific hounds tongue (*Cynoglossum grande*), slender wild oat, and soaproot (*Chlorogalum pomeridianum*). Lianas of Dutchman’s pipe (*Aristolochia californica*) and chaparral clematis (*Clematis lasiantha*) shroud shrubs and often grow into the tree canopy.

The blue oak–foothill pine community provides breeding habitat for a large variety of wildlife species, although no species is completely dependent on it for breeding, feeding, or cover. Many of the species found in blue oak habitat are also found here. Acorns and gray pine seeds are an important resource for many of the species using this habitat, such as the acorn woodpecker, western scrub-jay, and western gray squirrel. The newly emerged leaves of oaks in the spring support an abundance of insects that attract migrating and nesting warblers, vireos, flycatchers, and other insectivorous birds. In addition, the shrubs provide habitat for birds, such as the spotted towhee (*Pipilo maculatus*), California towhee (*Pipilo crissalis*), wrentit (*Chamaea fasciata*), and blue-gray gnatcatcher (*Polioptila caerulea*). Characteristic reptiles and amphibians include western toads (*Bufo boreas*), a wide variety of snakes (common garter snakes, California whipsnakes (*Masticophis lateralis*), gopher snakes, and western rattlesnakes), western skinks, southern alligator lizards, and western fence lizards.

Closed-Cone Pine–Cypress Closed-cone pine–cypress consists of open to dense knobcone pine (*Pinus contorta*) stands. This habitat is scattered throughout all portions of the Shasta Lake and vicinity portion of the primary study area and often occurs in disturbed areas, including areas subject to wildfires and historic mining activities. Dominant species include knobcone pine, with occasional canyon live oak (*Quercus chrysolepis*), California black oak, ponderosa pine, and gray pine. The shrub layer is moderate to dense and is dominated by white leaf manzanita and poison oak. The ground cover varies and is dominated by various grasses and forbs. Numerous game and nongame

species make use of this habitat for feeding and cover. Steller's jays (*Cyanocitta stelleri*) and western scrub-jays, downy woodpeckers (*Picoides pubescens*), and western gray squirrels extract seeds from partially opened cones. The great horned owl and red-tailed hawk are among the few species known to use this habitat for breeding.

Douglas-Fir As a habitat type, Douglas-fir is uncommon in the Shasta Lake and vicinity portion of the primary study area. This habitat type occurs in the upper portion of the McCloud Arm. Douglas-fir is characterized by moderate to dense conifer stands dominated by Douglas-fir (*Pseudotsuga menziesii*), with occasional ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), incense cedar (*Calocedrus decurrens*), canyon live oak, and California black oak. Associated understory species vary and include Pacific dogwood (*Cornus nuttallii*), mock orange (*Philadelphus lewisii*), poison oak, snowdrop bush, and white leaf manzanita. The ground layer ranges from open to moderate and is dominated by various grasses and forbs. The multilayered vegetation in the Douglas-fir community supports a variety of wildlife species. A significant feature of the community is the presence of cavity-bearing trees. Mature, fire-damaged, and wind-damaged forests typically contain snags (dead trees that are still standing), which are a valuable resource for birds and mammals that prefer nest and den sites in cavities, such as the flammulated owl (*Otus flammeolus*) and northern pygmy owl (*Glaucidium gnoma*). Snags also support wood-boring insects that provide food for bark-gleaning insectivorous birds, such as the brown creeper (*Certhia americana*). Other birds foraging and/or breeding in this habitat include the sharp-shinned hawk (*Accipiter striatus*), American peregrine falcon, mountain quail, western wood-pewee (*Contopus sordidulus*), and western tanager (*Piranga ludoviciana*). Mammals found in this habitat include the long-eared myotis (*Myotis evotis*), western red bat (*Lasiurus blossevillii*), northern flying squirrel (*Glaucomys sabrinus*), and bobcat (*Lynx rufus*).

Klamath Mixed Conifer Klamath mixed conifer is an uncommon habitat type in the Shasta Lake and vicinity portion of the primary study area. This habitat type occurs in the upper portion of the Pit Arm, and in scattered locations in the watershed above the Shasta Lake and vicinity portion of the primary study area. Klamath mixed conifer is characterized by conifer stands dominated by Douglas-fir, ponderosa pine, sugar pine, with occasional incense cedar. Dominant hardwoods include canyon live oak, California black oak, and Pacific madrone (*Arbutus menziesii*). Associated understory species vary and include Pacific dogwood, mock orange, poison oak, and snowberry (*Symphoricarpos* sp.). The ground layer ranges from open to moderate and is dominated by various grasses and forbs. These forest stands are generally complex structurally, tend to grow on cooler northerly aspect slopes, and support similar wildlife species as the Douglas-fir habitat.

Lacustrine Lacustrine habitat consists of the area regularly inundated by Shasta Lake (i.e., areas up to and below the 1,070-foot elevation). Most of this

area is barren of vegetation and is characterized as exposed soil and/or rock. Portions of the lacustrine habitat do support vegetation during draw-down periods, including woody riparian species, such as black willow, button willow, Fremont cottonwood, and various grasses and forbs.

Mixed Chaparral Mixed chaparral is a common habitat type and is scattered throughout all portions of the Shasta Lake and vicinity portion of the primary study area. This habitat often occurs on exposed slopes and/or in disturbed areas, including areas subject to wildfires and historic mining activities. Mixed chaparral is typically characterized by dense shrub stands dominated by white leaf manzanita, buck brush, toyon (*Heteromeles arbutifolia*), California buckeye, Brewer's oak (*Quercus garryana* var. *breweri*), California bay (*Umbellularia californica*), interior live oak, Lemmon's ceanothus (*Ceanothus lemmonii*), birch-leaf mountain mahogany (*Cercocarpus betuloides*), holly-leaf redberry (*Rhamnus ilicifolia*), yerba santa (*Eriodictyon californicum*), and poison oak. Few herbaceous plants occur in this habitat. Mixed chaparral provides habitat for a wide variety of wildlife species. It provides seeds, fruit, and protection from predators and harsh weather. In addition, it provides singing, roosting, and nesting sites for many species of birds, including the California quail (*Callipepla californica*), wrentit, and Bewick's wren (*Thryomanes bewickii*). Mammals common in this habitat include the black-tailed hare (*Lepus californicus*), gray fox, coyote, and deer mouse. Reptiles that make use of this habitat include the western fence lizard and southern alligator lizard.

Montane Hardwood Montane hardwood is a common tree habitat type and is scattered throughout all portions of the Shasta Lake and vicinity portion of the primary study area. The montane hardwood stands are typically characterized by moderate to dense stands of California black oak, canyon live oak, and occasional interior live oak. The understory is variable, although often sparse in the evergreen (live oak) stands because of a typically dense overstory canopy. Mast crops provided by montane hardwood forests are an important food resource for many species, including the acorn woodpecker, Steller's jay, mountain quail (*Oreortyx pictus*), western gray squirrel, and black-tailed deer. In addition, cavities in mature trees provide nesting and denning habitat for species such as the northern flicker, western screech owl (*Otus kennicottii*), American kestrel, and Virginia opossum. In moist areas, many amphibians and reptiles are found in the duff layer, including ensatina (salamander) (*Ensatina eschscholtzii*) and western skink.

Montane Hardwood–Conifer Montane hardwood–conifer is a common tree habitat type and is scattered throughout all portions of the Shasta Lake and vicinity portion of the primary study area. Montane hardwood–conifer is a complex forest type generally characterized by a complex of hardwood and conifer tree species. Stand composition varies, depending on numerous physical and geographic factors, and can include California black oak, canyon live oak, interior live oak, Oregon white oak (*Quercus garryana*), gray pine, ponderosa

pine, Douglas-fir, sugar pine, and knobcone pine. Understory species are generally moderate to dense and include white leaf manzanita, buck brush, California buckeye, western redbud (*Cercis occidentalis*), California bay, poison oak, birch-leaf mountain mahogany, Brewer's oak, and snowdrop bush. The ground layer varies and is dominated by various grasses and forbs, including pussy ears, soaproot, Pacific hound's tongue, and slender wild oat.

The variability of the canopy cover and understory vegetation makes montane hardwood–conifer habitat suitable for numerous species of wildlife. Hollow trees and logs provide denning sites for mammals, such as the coyote and gray fox, and cavities in mature trees are used by cavity-dwelling species, such as the acorn woodpecker, violet-green swallow (*Tachycineta thalassina*), northern flicker, great horned owl, raccoon, and California myotis (*Myotis californicus*). In addition, raptors, such as the red-tailed hawk, construct nests in the upper canopy of mature trees. Moreover, mast crops and conifer seeds are an important food source for many birds and mammals, including the Steller's jay, acorn woodpecker, California quail, black-tailed deer, and western gray squirrel. In moist areas, many amphibians and reptiles, including ensatina and western fence lizards, inhabit the duff layer. Snakes, including the western rattlesnake and sharp-tailed snake (*Contia tenuis*), also are found in this habitat.

Montane Riparian Montane riparian is the dominant riparian habitat type and is scattered throughout all portions of the Shasta Lake and vicinity portion of the primary study area. Montane riparian habitat occurs as thin stringers and large patches along most stream corridors and is characterized as a sparse overstory of white alder (*Alnus rhombifolia*), Fremont cottonwood (*Populus fremontii*), or big leaf maple (*Acer macrophyllum*), along with a fairly dense mid-story and herbaceous layer. The mid-story is dominated by red osier dogwood (*Cornus sericea*), arroyo willow (*Salix lasiolepis*), narrow-leaved willow (*S. exigua*), red willow (*S. laevigata*), spicebush (*Calycanthus occidentalis*), mock orange, button willow (*Cephalanthus occidentalis*), American dogwood (*Cornus cericea*), California ash (*Fraxinus dipetala*), and mugwort (*Artemisia douglasiana*). Brambles of Himalayan blackberry (*Rubus armeniacus*) and California blackberry (*R. ursinus*) often engulf broader, low-gradient riparian areas. Lianas, including California grape and greenbriar (*Smilax californica*), grow into the canopy.

Riparian habitats are among the most important wildlife habitats because of their high floristic and structural diversity, high biomass (and therefore high food abundance), and high water availability. In addition to providing breeding, foraging, and roosting habitat for a diverse array of animals, riparian habitats also provide movement corridors for some species, connecting a variety of habitats throughout the region.

The leaf litter, fallen tree branches, and logs associated with the riparian community in the study area provide cover for the western toad and Pacific chorus frog. The western fence lizard, western skink, and southern alligator

lizard are also expected to occur here. Common species nesting and foraging primarily in the riparian tree canopy include the bushtit (*Psaltriparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), and Nuttall's woodpecker (*Picoides nuttallii*). Other resident species, such as the spotted towhee and song sparrow (*Melospiza melodia*), nest and forage on or very close to the ground, usually in dense vegetation. A variety of mammals also inhabit riparian communities, including the deer mouse, raccoon, Virginia opossum, and several bat species.

Ponderosa Pine Ponderosa pine is the most common conifer habitat type in the Shasta Lake and vicinity portion of the primary study area and is scattered throughout all portions of the area. This habitat is characterized by open to dense conifer stands dominated by ponderosa pine. Associated species include occasional Douglas-fir, sugar pine, incense cedar, canyon live oak, and California black oak. Associated understory species vary and include redbud, buck brush, mock orange, poison oak, snowdrop bush, and white leaf manzanita. The ground layer ranges from open to moderate and is dominated by various grasses and forbs.

Ponderosa pine needles, cones, buds, pollen, twigs, seeds, and associated fungi and insects provide food for many species of birds and mammals, including the mountain quail, western gray squirrel, black-tailed deer, Allen's chipmunk (*Tamias senex*), and black bear (*Ursus americanus*). Mature trees provide nesting habitat for raptors, such as the bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), sharp-shinned hawk, and red-tailed hawk, and snags and hollow logs provide shelter for species such as the Virginia opossum, western spotted skunk (*Spilogale gracilis*), and several bat species.

Riverine Riverine habitat includes the free-flowing portions of the rivers and larger streams tributary to Shasta Lake. The riverine habitat is highly variable and ranges from moderately to well-confined stream reaches with low to steep gradient. Most riverine habitat is dominated by run-and-riffle habitats, with bedrock, boulder, cobble, gravel, and sand substrates. The vegetation in the active stream channel is sparse, with occasional clumps of torrent sedge (*Carex nudata*) and Indian rhubarb (*Darmera peltata*).

Riverine areas provide habitat for numerous fish, including rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), smallmouth bass (*Micropterus dolomieu*), and riffle sculpin (*Cottus gulosus*). Aquatic wildlife species include the foothill yellow-legged frog (*Rana boylei*), aquatic garter snake (*Thamnophis atratus*), and the aquatic phase of the rough-skinned newt (*Taricha granulosa granulosa*). Birds present include the American dipper (*Cinclus mexicanus*), common merganser (*Mergus merganser*), and belted kingfisher (*Ceryle alcyon*). Many mammals in the surrounding upland habitats use the riverine areas, including raccoon, gray fox, black-tailed deer, and many bat species.

Urban Urban habitat consists of various human-made features scattered throughout the Shasta Lake and vicinity portion of the primary study area, including resorts and a portion of the visitor center complex at Shasta Dam. These features are typically a combination of buildings, pavement areas with manicured landscaping, and lawns. The wildlife species most often associated with urban areas are those that are most tolerant of periodic human disturbances, including several introduced species, such as European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), and house mouse (*Mus musculus*). Native species that are able to use these habitats include the western fence lizard, American robin (*Turdus migratorius*), Brewer's blackbird (*Euphagus cyanocephalus*), northern mockingbird (*Mimus polyglottos*), mourning dove, house finch (*Carpodacus mexicanus*), California ground squirrel, black-tailed hare, and striped skunk (*Mephitis mephitis*). In addition, bats that forage in nearby habitats may make use of small cavities around the eaves of structures.

Upper Sacramento River (Shasta Dam to Red Bluff)

The following section provides a description of the wildlife habitats that exist along the Sacramento River throughout the primary study area, and a detailed discussion of potential Sacramento River downstream habitat restorations areas.

Important wildlife habitat is found throughout the upper Sacramento River portion of the primary study area, and large contiguous blocks that contain multiple habitat types have the potential to support the highest wildlife diversity and abundance. Overall, the quantity and variety of wildlife species now inhabiting the area have been reduced since agricultural and residential development permanently removed much of the native and natural habitat. Most affected have been wildlife species associated with riparian habitats, which have declined substantially and been highly altered by land use, water resources development, and land management practices. Wildlife species associated with grassland and oak woodland habitats have also been affected by habitat loss resulting from habitat conversions to residential, commercial, and agricultural uses; cattle grazing; and other compounding factors, such as lack of oak regeneration, spread of Sudden Oak Death Syndrome, and competition from invasive species. The region also supports a variety of nonnative plant and animal species, some of which are detrimental to survival of native species.

Habitats present in this portion of the primary study area are riparian woodland, riparian scrub, oak woodland, chaparral, annual grassland, agriculture, and urban. (See the *Wildlife Resources Technical Report* for a description of the plant and wildlife species typical of these habitats.) Riparian habitat has been designated by the CDFW as a sensitive habitat in California because of its limited abundance and high value to wildlife.

Potential Sacramento River Downstream Habitat Restoration Areas As a component of the SLWRI, Reclamation proposes to restore and/or enhance riparian and riverine habitats at six locations along the lower Sacramento River

below Shasta Dam. These six locations occur generally between the city of Redding and Reading Island, Shasta County, California. The purpose of the restoration effort is to improve spawning and rearing habitat for anadromous fish occurring in the Sacramento River. These six locations are referred to as the potential Sacramento River downstream habitat restoration areas (Figure 13-2).

The potential Sacramento River downstream habitat restoration areas are characterized by habitats typical of riparian and riverine areas along the Sacramento River below Shasta Dam. These habitats were also mapped and classified using the Guide to Wildlife Habitats of California (Mayer and Laudenslayer 1988). Habitats present in the potential Sacramento River downstream habitat restoration areas are summarized in Table 13-3, and shown in Figures 13-4a through 13-4f. General habitat descriptions for these locations are also described below.

Table 13-3. Summary of Wildlife Habitats in the Potential Sacramento River Downstream Habitat Restoration Areas

Habitat	Area (Acres ¹)						Total
	Henderson	Tobiasson Island	Shea Island Complex	Kapusta Island	Anderson River Park	Reading Island	
Annual grassland	2.50	13.73	2.61	18.15	7.83	0.00	44.82
Barren	0.31	1.10	0.00	0.00	0.55	0.00	1.96
Freshwater emergent wetland	3.73	0.28	0.54	0.43	11.05	15.33	31.36
Mixed chaparral	0.00	0.00	0.00	0.00	2.80	0.00	2.80
Orchard	0.00	0.00	0.00	0.00	0.00	0.55	0.55
Riverine	0.66	1.33	3.45	8.07	0.00	0.47	13.98
Valley-foothill riparian	13.12	9.06	28.97	25.08	57.90	24.78	158.90
Valley oak woodland	0.00	13.26	0.00	13.33	26.85	50.48	103.92
Total	20.32	38.76	35.57	65.06	106.96	91.61	358.29

Note:

¹ Acreage values are approximate.



Figure 13-4a. California Wildlife Habitat Relationship Types – Henderson Open Space

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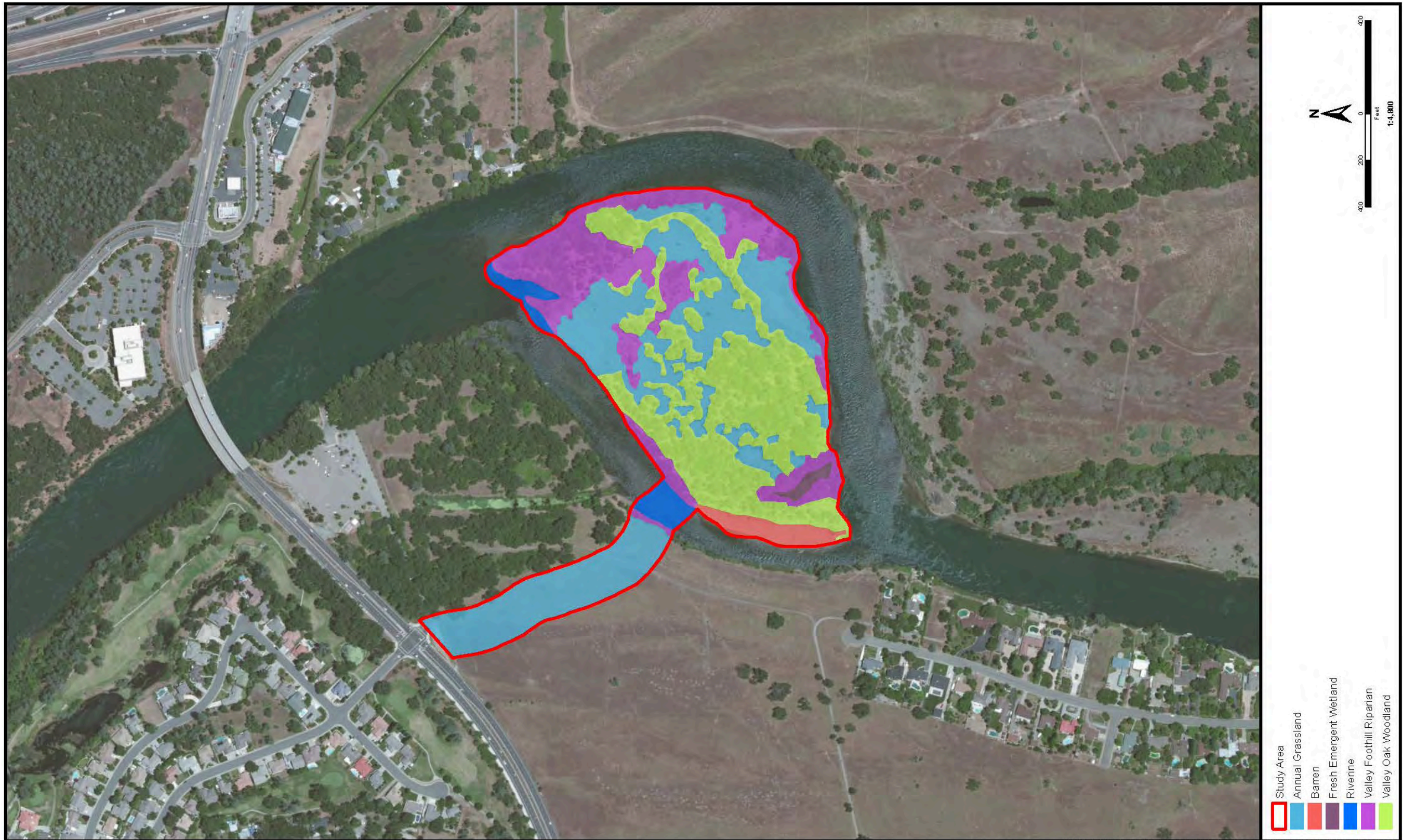


Figure 13-4b. California Wildlife Habitat Relationship Types – Tobiasson Island

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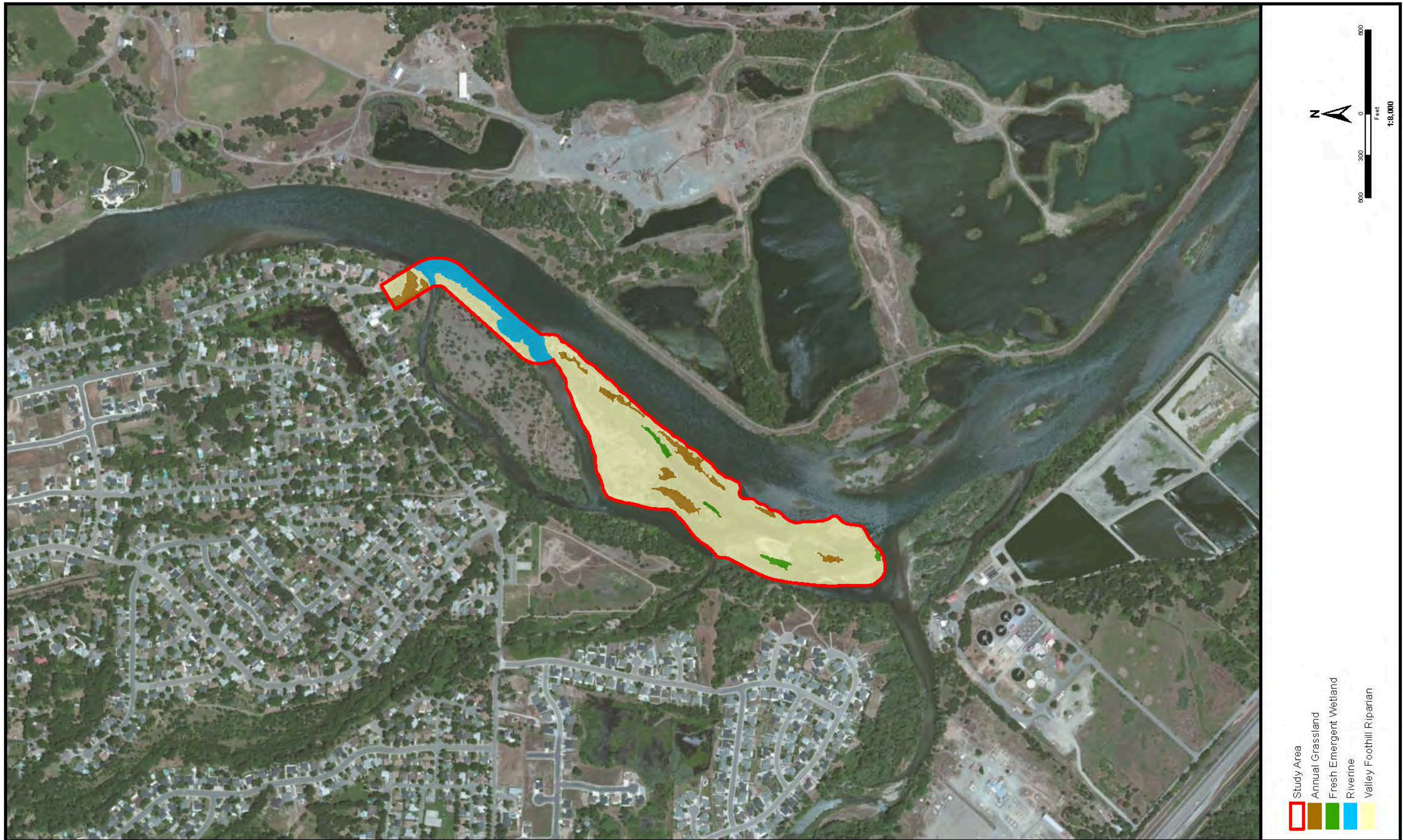


Figure 13-4c. California Wildlife Habitat Relationship Types – Shea Island Complex

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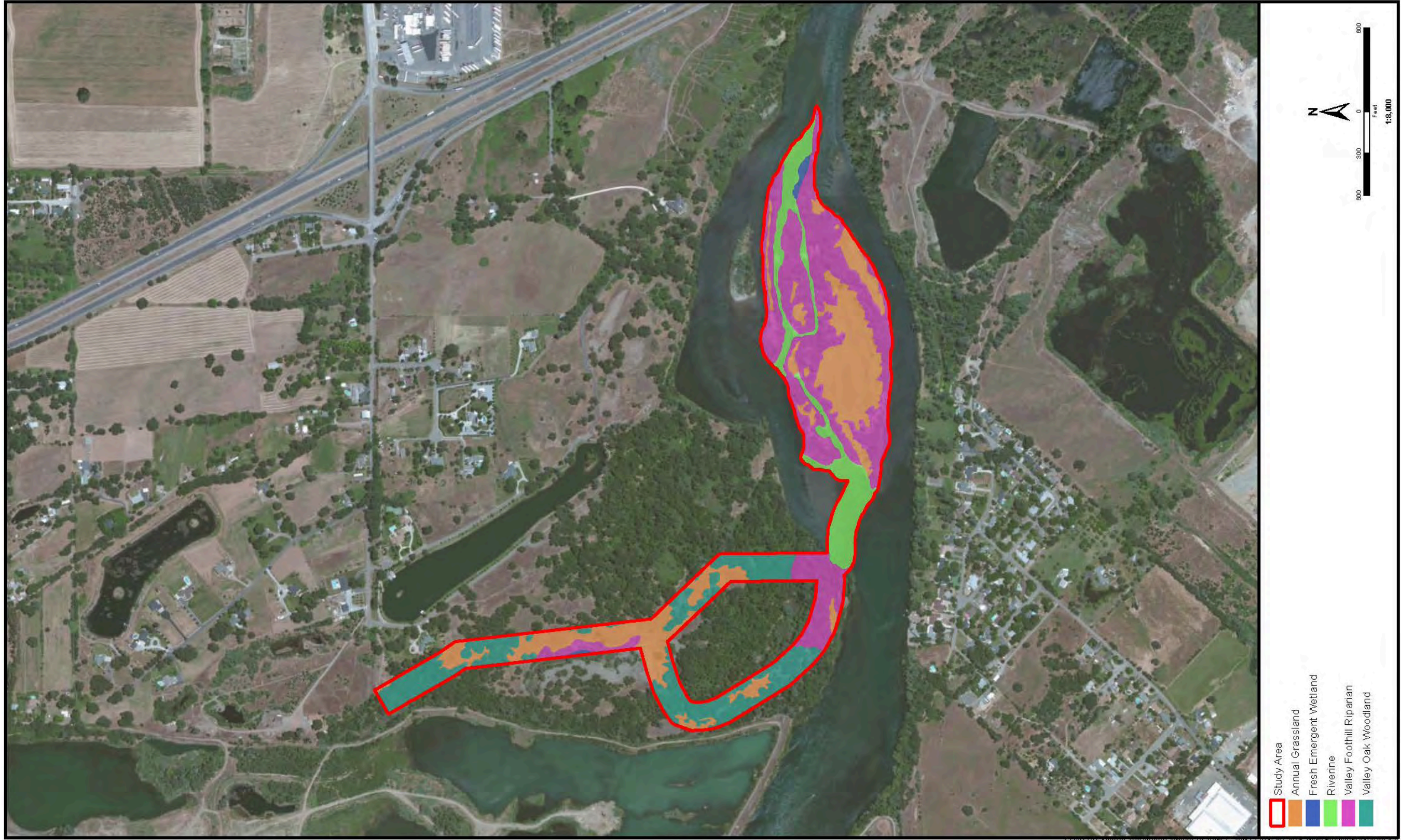


Figure 13-4d. California Wildlife Habitat Relationship Types – Kapusta Island

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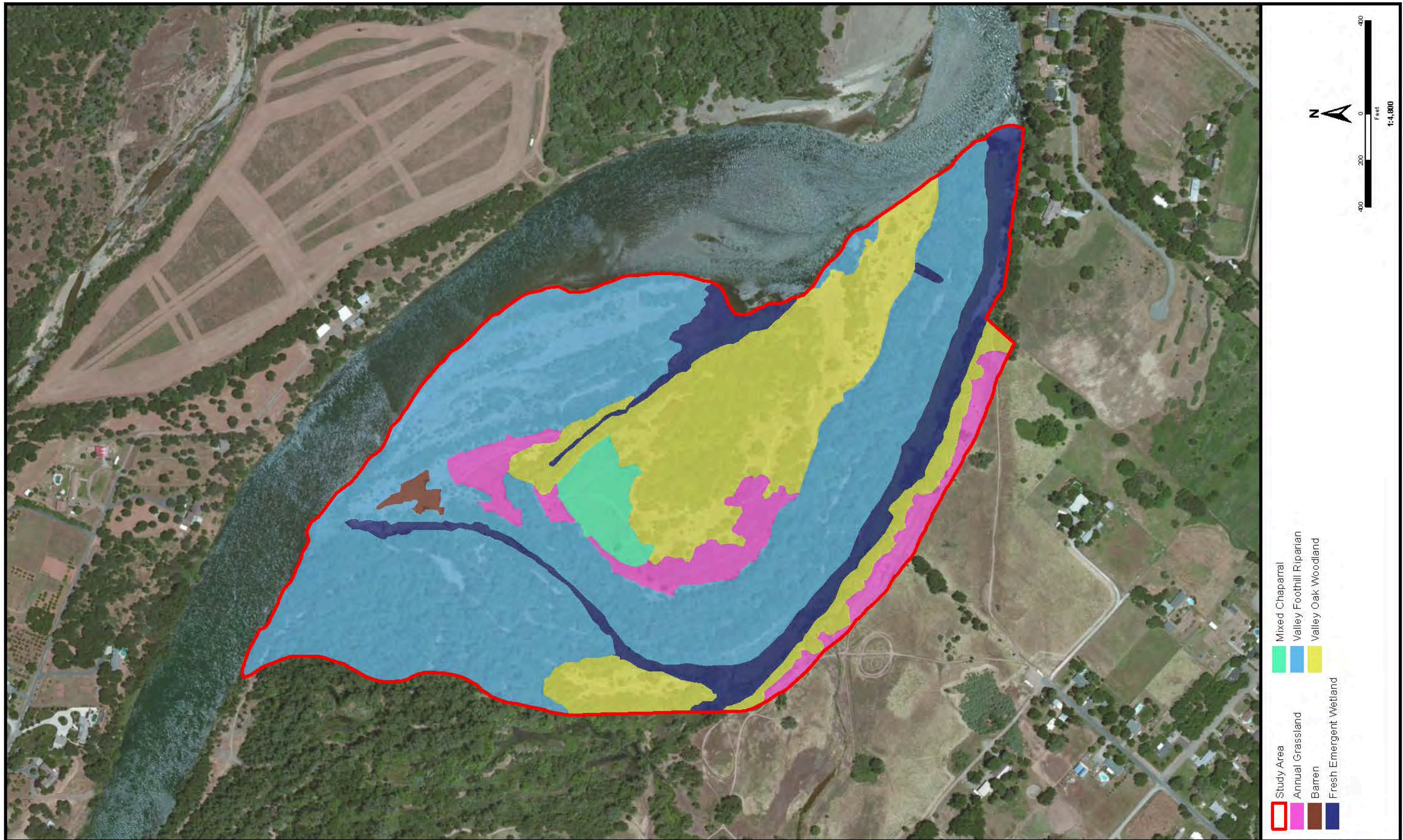


Figure 13-4e. California Wildlife Habitat Relationship Types – Anderson River Park

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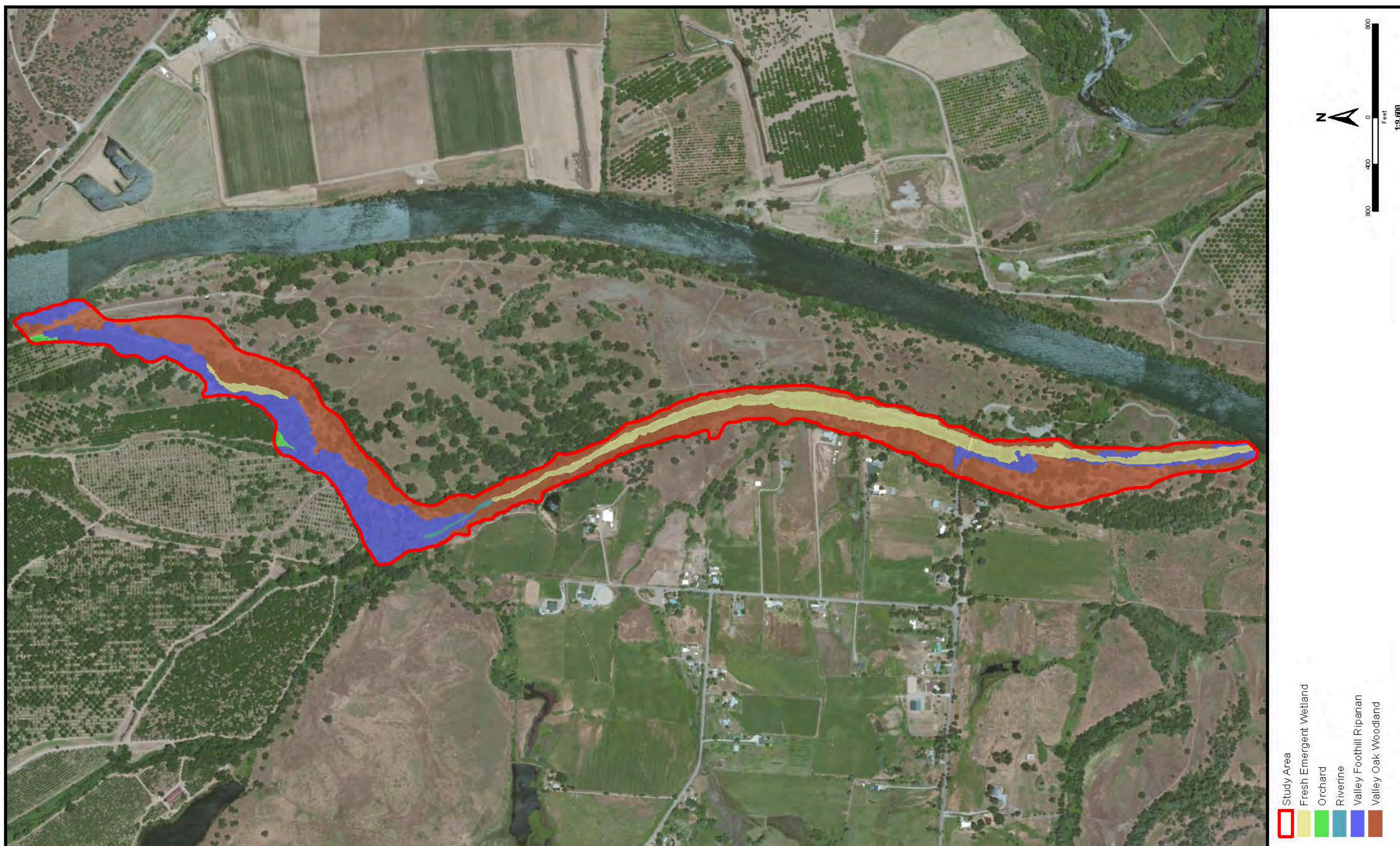


Figure 13-4f. California Wildlife Habitat Relationship Types – Reading Island

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Many of the same wildlife habitats found in the Shasta Lake and vicinity portion of the primary study area also occur in the potential Sacramento River habitat restoration areas. However, the species composition, structure, and overall function of these areas are significantly different, as these areas are situated in a separate geographic setting and region. Habitats occurring in the potential Sacramento River habitat restoration areas include annual grassland, barren, freshwater emergent wetland, mixed chaparral, orchard, riverine, valley-foothill riparian, and valley oak woodland.

Annual Grassland Annual grasslands are uncommon in the potential Sacramento River habitat restoration areas and occur as open ruderal areas and vegetated gravel bars. This plant community is characterized by moderate to dense cover of annual grasses and forbs including black mustard (*Brassica nigra*), California poppy (*Eschscholzia californica*), ripgut grass (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), wild oat (*Avena barbata*), rose clover (*Trifolium hirtum*), long beaked storks bill (*Erodium botrys*), turkey mullein (*Croton setigeris*), Oregon golden aster (*Heterotheca oregona*), and tall sock-destroyer (*Torilis arvensis*).

Barren Barren habitat occurs on gravel bars and is characterized by open areas of gravel and cobble substrates. Vegetation is typically absent, although in some barren areas sparse opportunistic grasses/forbs or weedy species may occur.

Freshwater Emergent Wetland Freshwater emergent wetlands occur along the margins of backwater sloughs and other wetland features, and as small inclusions in valley-foothill riparian habitats. These wetlands are characterized by dense stands of broadleaf cattail (*Typha latifolia*), with reed canarygrass (*Phalaris arundinacea*), horsetail (*Equisetum* sp.), smartweed (*Persicaria* sp.), sedges (*Carex* spp.), rushes (*Juncus* spp.), and dallisgrass (*Paspalum dilatatum*). Submergent vegetation dominated by parrot's feather (*Myriophyllum aquaticum*) and water primrose (*Ludwigia peploides*) grow in the deep water portions of the wetlands.

Mixed Chaparral Mixed chaparral is uncommon in the potential Sacramento River habitat restoration areas and only occurs at the Anderson River Park site. This habitat consists of shrub patches in open rocky areas in the central portion of the study area dominated by California yerba santa (*Eriodictyon californicum*) and wright's buckwheat (*Eriogonum wrightii*). Other associated species include Oregon golden aster, naked buckwheat (*Eriogonum nudum*), slender wild oat, mousetail, ripgut grass, soft chess, and red brome (*Bromus madritensis* ssp. *rubens*).

Orchard Orchard habitat is uncommon in the potential Sacramento River habitat restoration areas and only occurs at the Reading Island site. This habitat consists of a small portion of a walnut orchard extending into a portion of the northern site boundary. The walnut orchard is mature and well maintained.

Vegetation includes an overstory of walnut trees and ground cover of various grasses and forbs.

Riverine Riverine habitat occurs at each potential Sacramento River habitat restoration area and consists of portions of active Sacramento River channel within and/or around each site. The riverbed is dominated by primarily gravel, cobble, and boulder substrates.

Valley-foothill Riparian Valley-foothill riparian is the dominant habitat in the potential Sacramento River habitat restoration areas and occurs as moderate to dense stands of mainly riparian trees and shrubs. Many tree and shrub species occur including Fremont cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), Oregon ash (*Fraxinus latifolia*), white alder (*Alnus rhombifolia*), narrowleaf willow (*Salix exigua*), shining willow (*Salix lasiandra*), Goodding's black willow (*Salix gooddingii*), black locust (*Robinia pseudoacacia*), and silver wattle (*Acacia dealbata*). Understory vegetation is moderate to dense and includes Himalayan blackberry (*Rubus armeniacus*), California grape (*Vitis californica*), Santa Barbara sedge (*Carex barbarae*), giant reed (*Arundo donax*), mugwort (*Artemisia douglasii*), horsetail, and Johnson grass (*Sorghum halepense*).

Valley Oak Woodland Valley oak woodland is uncommon in the potential Sacramento River habitat restoration areas and only occurs at the Anderson River Park site and a small portion of the Tobiasson Island site. This habitat occurs above the active floodplain of the Sacramento River and is characterized by a moderate overstory of valley oak (*Quercus lobata*) with occasional interior live oak (*Quercus wislizenii*), foothill pine (*Pinus sabiniana*), narrowleaf willow, shining willow, Fremont cottonwood, Oregon ash, and tree of heaven (*Ailanthus altissima*). Dominant understory vegetation includes western redbud (*Cercis occidentalis*), California coffee berry (*Frangula californica*), mugwort, winter vetch (*Vicia villosa*), Santa Barbara sedge, ripgut grass, common ragweed (*Ambrosia artemisiifolia*), and Bermuda grass (*Cynodon dactylon*).

Lower Sacramento River and Delta

The roughly 300 miles of the Sacramento River can be subdivided into distinct reaches. The reaches in the lower Sacramento River and Delta portion of the extended study area are discussed separately below because of differences in morphology, riparian vegetation, and habitat functions.

Sacramento River from Red Bluff Pumping Plant to the Delta Most habitat types and many of the wildlife species found in the upper Sacramento River portion of the primary study area have the potential to occur in the Central Valley portion of the extended study area, with additional species occurring in upland and foothill areas. The segment of the extended study area between Red Bluff Pumping Plant and the Delta includes a diverse array of wildlife habitats – floodplains, basins, terraces, active and remnant channels, and oxbow sloughs. The variety and availability of habitats along the middle Sacramento River

support a wide range of wildlife species: a variety of resident and migratory waterfowl, raptors, and songbirds, plus a variety of mammals, amphibians, and reptiles that inhabit both aquatic and upland habitats.

Sacramento–San Joaquin River Delta Delta wetlands are considered to be among the most productive wildlife habitats in California. These wetlands consist of permanent saline, brackish, and freshwater marshes; seasonal freshwater wetlands; open water; tidal and nontidal marshes, and emergent wetlands; and seasonally flooded agricultural cropland, such as rice fields (CALFED 2000a). (See the *Wildlife Resources Technical Report* for a discussion of the plant and wildlife species typical of Delta wetlands.)

San Joaquin River Basin to the Delta Most habitat types and many of the wildlife species described above for the Sacramento River corridor have the potential to occur in the Central Valley portion of the extended study area, with additional species occurring in upland and foothill areas. The current wildlife habitat value of this area is somewhat limited by the predominance of agricultural lands, which support a relatively low diversity of wildlife species. However, the orchards, row and field crops, and fallow fields can be used by a number of common species, and fallow fields and some crops (e.g., wheat and barley) can support a variety of small mammals and provide high-quality foraging habitat for many species of raptors. More importantly, remnant native vegetation patches are likely to support a high diversity of wildlife species.

CVP/SWP Service Areas

The CVP and SWP service areas contain a large diversity of both lowland and upland habitats and species, although agricultural and urban growth has reduced the area and connectivity of important habitats that are critical to sustaining a wide variety of unique plants and animals (CALFED 2000a). The agricultural land and urban development that dominate the CVP and SWP service areas, respectively, can support many wildlife species, most of which are highly adapted to these disturbed environments.

13.1.2 Special-Status Species

Special-status species addressed in this section include animals that are legally protected or are otherwise considered sensitive by Federal, State, or local resource conservation agencies and organizations. Specifically, these include species that are Federally listed and/or State-listed as rare, threatened, or endangered; those considered as candidates or proposed for listing as threatened or endangered; species identified by CDFW as fully protected or species of special concern; species identified by USFS as sensitive, or endemic; species identified by the U.S. Department of the Interior, Bureau of Land Management (BLM) as sensitive; species designated by the *Northwest Forest Plan* (NWFP) as survey and manage (S&M); other animals protected by the California Fish and Game Code; and those designated as Multi-Species Conservation Strategy (MSCS) covered species by the CALFED Bay-Delta Program (CALFED).

Shasta Lake and Vicinity

For the purposes of this evaluation, wildlife species of concern include species that are any of the following:

- Designated as threatened or endangered by the State or Federal government
- Proposed or petitioned for Federal listing as threatened or endangered
- State or Federal candidates for listing as threatened or endangered
- Identified by CDFW as a species of special concern
- Considered sensitive or endemic by USFS
- Considered sensitive by BLM
- Considered S&M species by NWFP
- Designated as MSCS-covered species by CALFED

Special-status wildlife species with the potential to occur in the Shasta Lake and vicinity portion of the primary study area were determined using several database searches; review of USFWS and CDFW special-status species lists for Shasta County; review of the CALFED MSCS list; review of other appropriate literature; discussions with BLM, CDFW, DWR, USFS, and USFWS personnel; and professional experience in the area. All special-status wildlife species potentially occurring in the Shasta Lake and vicinity portion of the primary study area are discussed in Attachment 1 of the *Wildlife Resources Technical Report*, which provides a general comparison of habitat requirements for each species and the general habitats in the primary study area above Shasta Dam. For those special-status species for which generally suitable habitat was determined to be present, results from the various vegetation habitat mapping and wildlife surveys conducted in the area by Reclamation since 2002 were used to determine the likelihood of their presence in the primary study area above Shasta Dam (Table 13-4).

The S&M species include all species included in the January 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines* (U.S. Department of Agriculture and U.S. Department of the Interior 2001) (2001 S&M Record of Decision [ROD]) The current S&M species list is from the 2001 S&M ROD and includes species listed in the 2001 S&M ROD *Survey and Manage Standards and Guidelines and Category Assignment* (BLM December 2013). For the purposes of this evaluation, S&M species of concern include taxa that are designated as Category A and C by the current category

assignment. These categories include taxa that require what are known as pre-disturbance (i.e., pre-project) surveys.

The CNDDDB was reviewed for records of special-status plant species in or near the Shasta Lake and vicinity portion of the primary study area. The CNDDDB is a database consisting of historical observations of special-status plant species, wildlife species, and natural communities. The CNDDDB is limited to reported sightings and is not a comprehensive list of special-status species that could occur in a particular area.

Table 13-4. Wildlife Species of Concern in the Shasta Lake and Vicinity Portion of the Primary Study Area

Common Name	Scientific Name	Status ¹	Potential for Occurrence
Western bumble bee	<i>Bombus occidentalis</i>	USFS S	Various habitats with abundant flowering vegetation from spring through fall.
Church's sideband	<i>Monadenis churchi</i>	S&M	Potentially occurring in mixed conifer and conifer/woodland habitats. Many known occurrences in the Shasta Lake and vicinity portion of the study area.
Shasta sideband	<i>Monadenia troglodytes troglodytes</i>	FP, USFS S, S&M, MSCS m	Endemic to Shasta County. Potentially occurring in mixed conifer and woodland habitats, especially near limestone. Species occurs in limestone on the McCloud Arm.
Wintu sideband	<i>Monadenia troglodytes wintu</i>	FP, USFS S, S&M	Endemic to Shasta County. Potentially occurring in mixed conifer and woodland habitats, especially near limestone. Known to occur between the Pit and Squaw Creek arms and at Mountain Gate.
Oregon shoulderband	<i>Helminthoglypta hertlenii</i>	S&M	Potentially occurring in mixed conifer and conifer/woodland habitats. Many known occurrences in the Shasta Lake and vicinity portion of the study area.
Shasta chaparral	<i>Trilobopsis roperi</i>	FP, USFS S, S&M	Endemic to Shasta County. Potentially occurring in mixed conifer and conifer/woodland habitats. Known occurrences in the Shasta Lake and vicinity portion of the study area.
Shasta hesperian	<i>Vespericola shasta</i>	FP, USFS S, S&M	Endemic to the southeastern Klamath Mountains. Potentially occurring in mixed conifer and conifer/woodland habitats (riparian and/or riverine habitats). Known occurrences in the Shasta Lake and vicinity portion of the study area.
Shasta salamander	<i>Hydromantes shastae</i>	CT, USFS S, S&M, MSCS m, BLMS	Only known from the southeastern Klamath Mountains. Potentially occurring in mixed conifer, woodland, and chaparral habitats, especially near limestone. Known occurrences in the Shasta Lake and vicinity portion of the study area.
Tailed frog	<i>Ascaphus truei</i>	CSC	Potentially occurring in stream habitats in the Shasta Lake and vicinity portion of the study area. Known occurrences in the McCloud Arm and the upper Sacramento Arm tributaries outside the study area boundaries (CDFG 2003).

Table 13-4. Wildlife Species of Concern in the Shasta Lake and Vicinity Portion of the Primary Study Area (contd.)

Common Name	Scientific Name	Status ¹	Potential for Occurrence
California red-legged frog	<i>Rana draytonii</i>	FT, CSC, MSCS m	Requires aquatic habitat for breeding; also uses a variety of other habitat types, including riparian and upland areas. The Shasta Lake and vicinity portion of the study area is outside the current species range. A USFWS habitat assessment is in preparation to determine habitat suitability.
Foothill yellow-legged frog	<i>Rana boylei</i>	CSC, USFS S, MSCS m, BLMS	Potentially occurring in stream habitats. Known occurrences scattered throughout the Shasta Lake and vicinity portion of the primary study area.
Northwestern pond turtle	<i>Actinemys marmorata</i>	CSC, USFS S, MSCS m	Potentially occurring in stream or other wetland habitats. Adjacent upland habitats are potential nesting areas. Known occurrences scattered throughout the Shasta Lake and vicinity portion of the primary study area.
Great blue heron	<i>Ardea herodias</i>	MSCS m	Known to breed in nearshore wooded habitat in the Turntable Bay area of Shasta Lake.
Cooper's hawk	<i>Accipiter cooperi</i>	MSCS m	Potentially occurring in mixed conifer and conifer/woodland habitats.
Northern goshawk	<i>Accipiter gentilis</i>	CSC, USFS S, BLMS	Potentially occurring in mixed conifer habitats. Known to occur in the upper McCloud Arm.
Bald eagle	<i>Haliaeetus leucocephalus</i>	FD, FB, CE, CP, USFS S, MSCS m, BLMS	Occur in riverine and lacustrine habitats. Common at Shasta Lake, and a substantial number of nests occur in the Shasta Lake and vicinity portion of the primary study area and vicinity. Shasta Lake has the highest density of breeding bald eagles in the continental United States.
Osprey	<i>Pandion haliaetus</i>	MSCS m	Occur in riverine and lacustrine habitats. Common at Shasta Lake, and many known nests occur in the Shasta Lake and vicinity portion of the primary study area and vicinity.
American peregrine falcon	<i>Falco peregrinus anatum</i>	FD, CD, CP, MSCS m	Potentially occurring in mixed conifer and conifer/woodland habitats. Nesting sites in the study area unlikely due to lack of suitable eyrie sites; however, potential eyrie sites occur adjacent to the Shasta Lake and vicinity portion of the primary study area. A historical nest site occurs in the cliffs near Shasta Caverns and a "new" nest site is believed to occur in cliffs along the Sacramento Arm of Shasta Lake. Another nest site is located south of Shasta Lake at Gray Rocks, near Mountain Gate.
Long-eared owl	<i>Asio otus</i>	CSC, MSCS m	Potentially occurring in coniferous forest habitats.

Table 13-4. Wildlife Species of Concern in the Shasta Lake and Vicinity Portion of the Primary Study Area (contd.)

Common Name	Scientific Name	Status ¹	Potential for Occurrence
Northern spotted owl	<i>Strix occidentalis caurina</i>	FT, MSCS m	Potentially occurring in coniferous forest habitats. The species has been recorded within 0.5 mile of the study area along the Squaw Creek Arm. Potential dispersal habitat occurs in the Shasta Lake and vicinity portion of the primary study area. No designated critical habitat occurs in the Shasta Lake and vicinity portion of the primary study area.
Vaux's swift	<i>Chaetura vauxi</i>	CSC	Potentially occurring in coniferous forest and conifer/woodland habitats. Known to occur in the Shasta Lake and vicinity portion of the study area.
Willow flycatcher	<i>Empidonax traillii</i>	CE, USFS S, MSCS r	Uncommon migrant in riparian habitat; unlikely to nest in the Shasta Lake and vicinity portion of the primary study area.
Purple martin	<i>Progne subis</i>	CSC	Potentially occurring in conifer, woodland, and riparian habitats. Foraging habitat occurs throughout Shasta Lake and vicinity portion of the primary study area. Nests along the Pit River Arm. Shasta Lake is one of the few known breeding sites in interior northern California.
Yellow warbler	<i>Dendroica petechia brewsteri</i>	CSC, MSCS r	Potentially occurring in riparian habitats. Known occurrences in and near the Shasta Lake and vicinity portion of the primary study area.
Yellow-breasted chat	<i>Icteria virens</i>	CSC, MSCS m	Potentially occurring in riparian habitats. Known occurrences in and near the Shasta Lake and vicinity portion of the primary study area.
Pallid bat	<i>Antrozous pallidus</i>	CSC, USFS S, BLMS	Potentially occurring in mixed conifer and conifer/woodland habitat throughout the study area.
Townsend's big-eared bat	<i>Plecotus townsendii</i>	CSC, USFS S	Potentially occurring in mixed conifer and conifer/woodland habitat throughout the study area. Known occurrence from a cave on the Backbone Arm in the Shasta Lake and vicinity portion of the primary study area.
Spotted bat	<i>Euderma maculatum</i>	CSC, BLMS	Potentially occurring in mixed conifer and conifer/woodland habitat throughout the study area. Species has been recorded on Squaw Creek within approximately 6 miles of the Shasta Lake and vicinity portion of the primary study area.
Western red bat	<i>Lasiurus blossevillii</i>	CSC	Potentially occurring in mixed conifer and conifer/woodland habitat throughout the Shasta Lake and vicinity portion of the primary study area.
Long-eared myotis	<i>Myotis evotis</i>	BLMS	Potentially occurring in a wide variety of forest habitats throughout the study area.
Yuma myotis	<i>Myotis yumanensis</i>	BLMS	Potentially occurring in a wide variety of forest habitats throughout the study area.

Table 13-4. Wildlife Species of Concern in the Shasta Lake and Vicinity Portion of the Primary Study Area (contd.)

Common Name	Scientific Name	Status ¹	Potential for Occurrence
Fringed myotis	<i>Myotis thysanodes</i>	USFS S	Potentially occurring in mixed conifer and conifer/woodland habitat throughout the Shasta Lake and vicinity portion of the primary study area.
Western mastiff bat	<i>Eumops perotis</i>	CSC, MSCS m (californicus subspecies only), BLMS	Potentially occurring in mixed conifer and conifer/woodland habitat throughout the Shasta Lake and vicinity portion of the primary study area.
Ringtail	<i>Bassariscus astutus</i>	CP, MSCS m	Potentially occurring in mixed conifer and conifer/woodland habitats. Known occurrences in and near the Shasta Lake and vicinity portion of the primary study area.
American marten	<i>Martes americana</i>	USFS S	Potentially occurring in mixed conifer habitats.
Pacific fisher	<i>Martes pennanti</i>	FC, CSC, USFS S, BLMS	Potentially occurring in mixed conifer and conifer/woodland habitats. Known occurrences in and near the Shasta Lake and vicinity portion of the primary study area.

Note:

¹Status Definitions

Key:

BLMS = U.S. Department of the Interior, Bureau of Land Management sensitive

CD= California delisted

CE = California endangered

CP = California fully protected

CSC = California species of special concern

CT = California (State) listed as threatened

FB = Federal Bald and Golden Eagle Protection Act

FC = Federal candidate for listing

FD = Federally delisted

FP = Federally petitioned for listing

FPD = Proposed for Federal delisting

FT = Federally listed as threatened

m = Maintain. Ensure that any adverse effects on the species that could be associated with implementation of CALFED Bay-Delta Program actions will be fully offset through implementation of actions beneficial to the species.

MSCS = Multi-Species Conservation Strategy covered species

r = Contribute to recovery. Implement some of the actions deemed necessary to recover species' populations in the Multi-Species Conservation Strategy focus area.

USFS M = U.S. Forest Service survey and manage species

USFS S = U.S. Forest Service sensitive

Species accounts for special-status wildlife in the Shasta Lake and vicinity portion of the primary study area are described in detail in Attachment 2 of the *Wildlife Resources Technical Report*. Figures 13-5a through 13-5f depict the known locations of special-status wildlife species in the primary study area above Shasta Dam located during various surveys conducted by Reclamation and from USFS records. Figures 13-6a through 13-6f depict the known locations of special-status terrestrial mollusks.

Summary of Wildlife Investigations

Terrestrial Mollusk Surveys (Survey and Manage) Reclamation has conducted three survey efforts for S&M terrestrial mollusk species in the Shasta Lake and vicinity portion of the primary study area. These include protocol-level efforts during 2002 to 2003 and 2005 along selected portions of the Shasta Lake shoreline, surveys conducted in 2010 at the relocation areas. Additionally, many other terrestrial mollusk locations have been found incidentally during numerous other biological survey tasks throughout the Shasta Lake and vicinity portion of the primary study area. Six S&M terrestrial mollusk species have been found to date: Church's sideband (*Monadenia churchi*), Shasta sideband (*Monadenia troglodytes troglodytes*), Wintu sideband (*Monadenia troglodytes wintu*), Oregon shoulderband (*Helminthoglypta hertlenii*), Shasta chaparral (*Trilobopsis roperi*), and Shasta hesperian (*Vespericola shasta*). Church's sideband and Oregon shoulderband were the most commonly occurring terrestrial mollusk species, as they were found at 325 and 220 locations, respectively. Shasta hesperian was found at 69 locations, while Shasta sideband and Shasta chaparral were found at 29 locations each. Wintu sideband was the least commonly occurring terrestrial mollusk species and was found at 2 locations (Figures 13-6a through 13-6f).

Shasta Salamander Surveys Reclamation has conducted three survey efforts for Shasta salamander in the Shasta Lake and vicinity portion of the primary study area. These include survey efforts during 2003 and 2006 to 2007 along selected portions of the Shasta Lake shoreline and surveys performed in 2010 and 2011 at the relocation areas. Additionally, several other Shasta salamander locations have been found incidentally during other biological survey tasks throughout the Shasta Lake and vicinity portion of the primary study area. Collectively, Shasta salamanders have been found at 39 locations during the survey efforts. These findings and other known locations show that this species occurs in all arms of Shasta Lake in both limestone and nonlimestone habitats (Figures 13-5a through 13-5f).

Bald Eagle/Osprey Surveys Reclamation mapped all known bald eagle and osprey nests in the Shasta Lake and vicinity portion of the primary study area in 2007 and 2010. Additional data, including diameter of nest trees, nest tree height, nest height, proximity to the high-water mark, surrounding vegetation, and shoreline erosion rating, were recorded for the bald eagle nests. Twenty-eight bald eagle nests and 54 osprey nests were located. Reclamation continued surveys and coordination with the USFS through 2013 to maintain current bald eagle and osprey nest site locations. Currently, 32 bald eagle and 54 osprey nest sites are known within or near the Shasta Lake and vicinity portion of the primary study area (Figures 13-5a through 13-5f).

Neotropical Migrant Bird Surveys Reclamation conducted a breeding bird survey in the Shasta Lake and vicinity portion of the primary study area in 2007. Additionally, focused surveys for purple martins and an analysis of purple martin habitat at Shasta Lake were conducted. These surveys provided information on use of the Shasta Lake and vicinity portion of the primary study

area by breeding birds, including breeding neotropical migrant species. Sixty-seven bird species were detected during these surveys, including 38 neotropical migrant species.