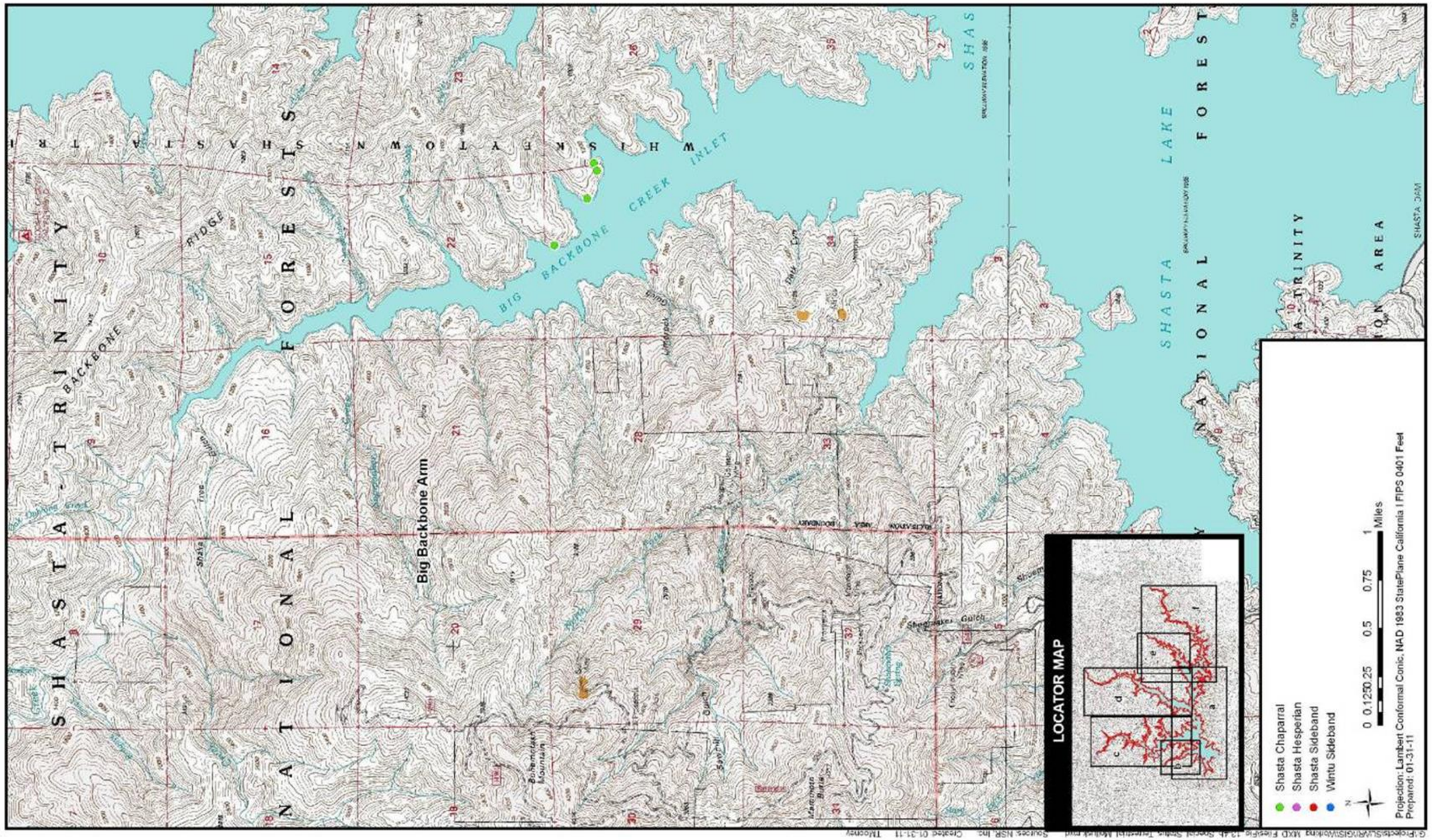

Figure 1-5b. Special-Status Terrestrial Mollusks Occurring in Shasta Lake and Vicinity

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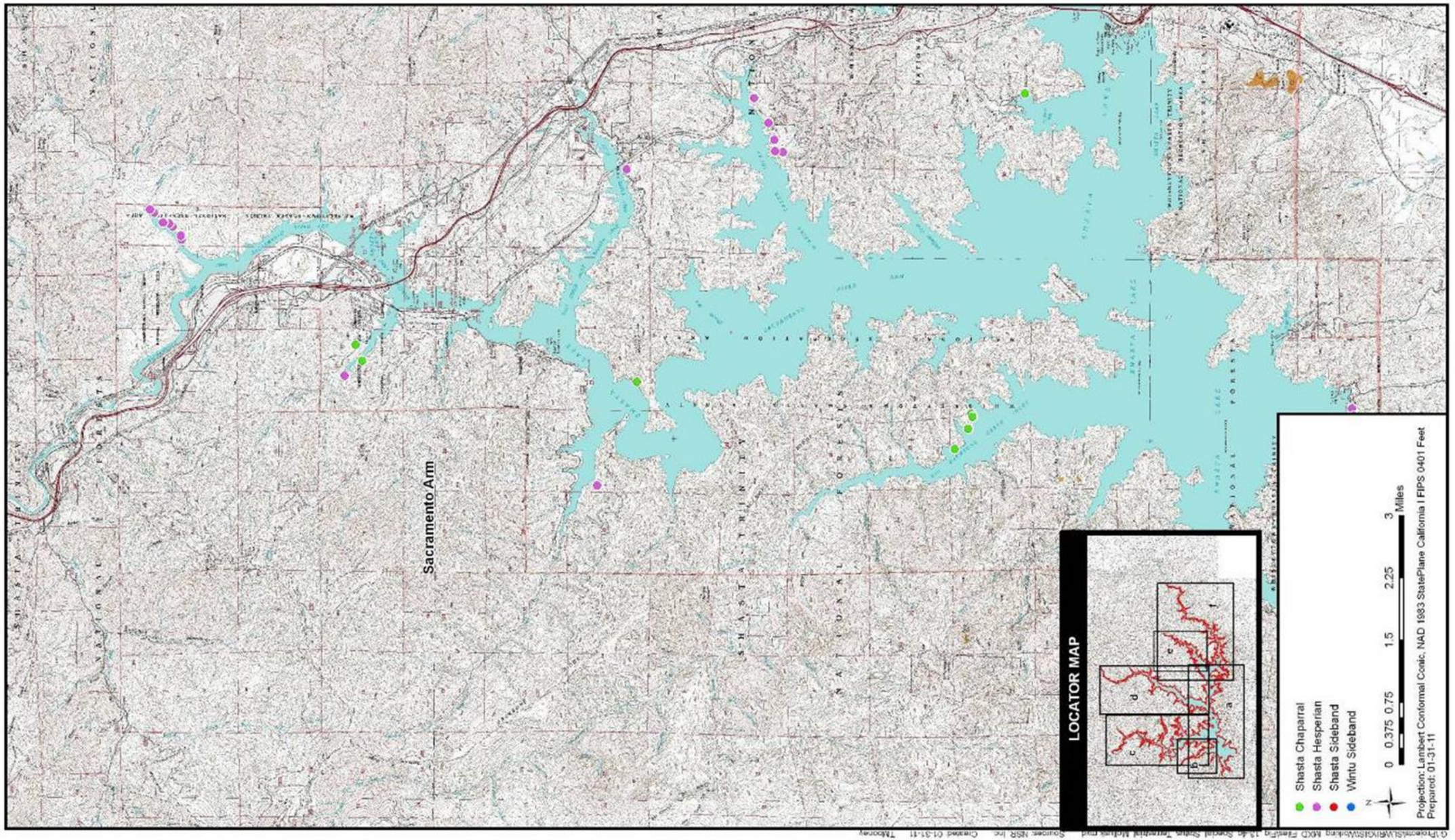

Figure 1-5c. Special-Status Terrestrial Mollusks Occurring in Shasta Lake and Vicinity

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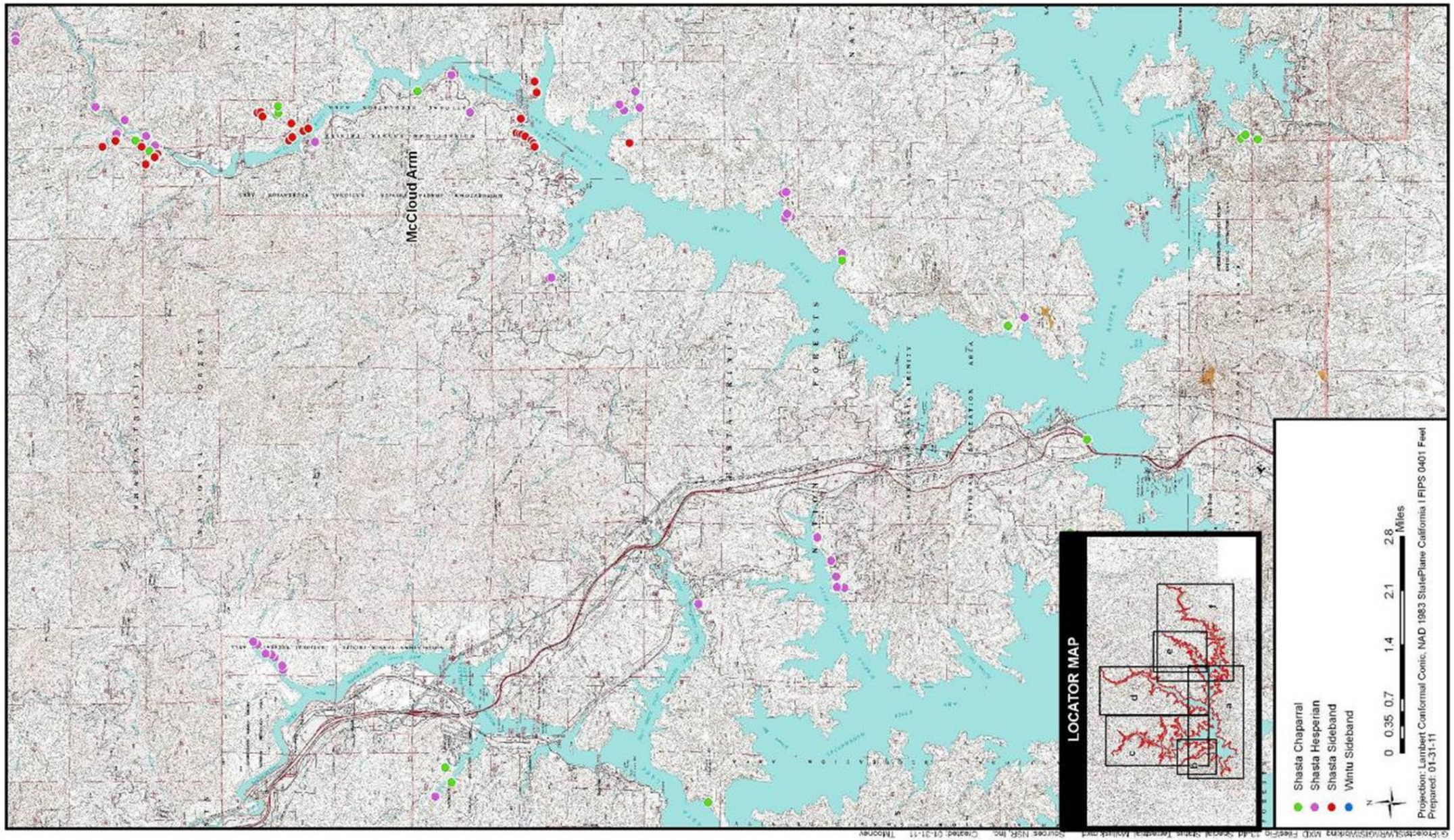

Figure 1-5d. Special-Status Terrestrial Mollusks Occurring in Shasta Lake and Vicinity

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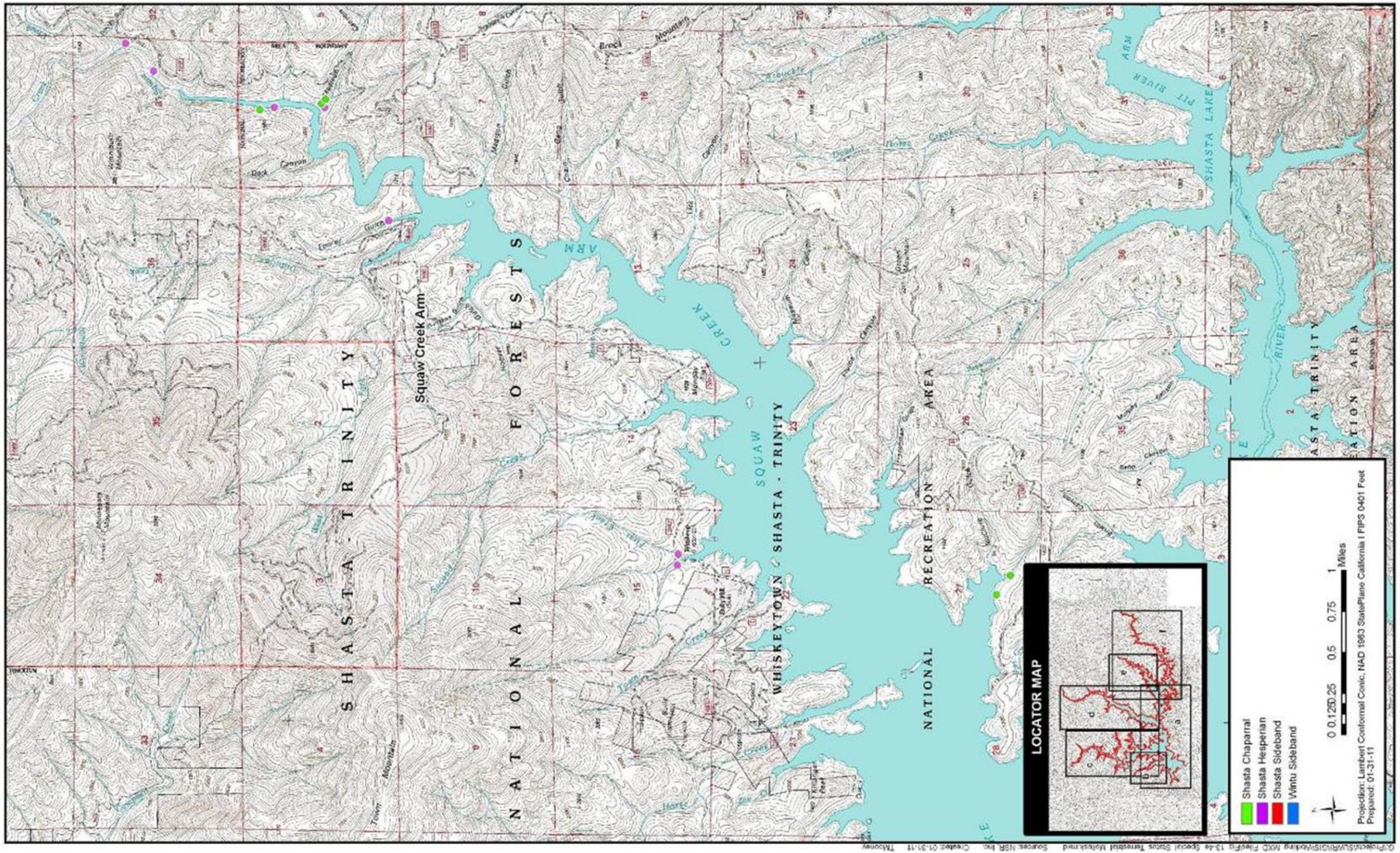

Figure 1-5e. Special-Status Terrestrial Mollusks Occurring in Shasta Lake and Vicinity

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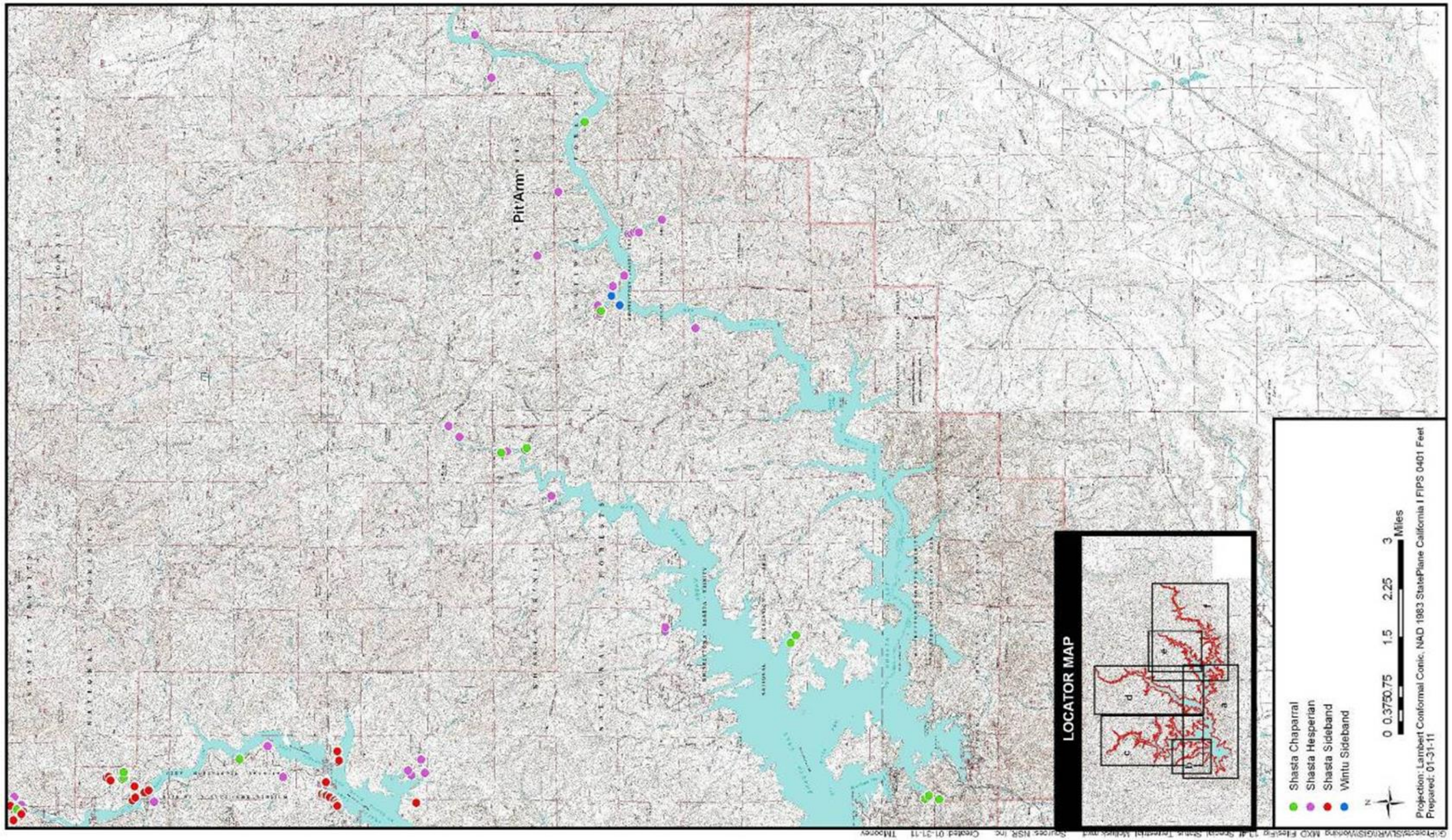

Figure 1-5f. Special-Status Terrestrial Mollusks Occurring in Shasta Lake and Vicinity

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Forest Carnivore Surveys Reclamation conducted surveys for sensitive forest carnivore species (forest carnivores) in the Shasta Lake and vicinity portion of the primary study area during 2003–2005. The specific sensitive forest carnivore species (i.e., "target species") surveyed included the Sierra Nevada red fox (*Vulpes vulpes necator*), American marten (*Martes americana*), Pacific fisher (*Martes pennanti*), and wolverine (*Gulo gulo*). One target forest carnivore species, the Pacific fisher, was detected. Pacific fisher was detected at 13 locations scattered in all areas of the Shasta Lake and vicinity portion of the primary study area, except the McCloud Arm (Figures 13-4a through 13-4f in Chapter 13 of the DEIS). Additionally, the ringtail, a California fully protected species, was detected in all areas of the Shasta Lake and vicinity portion of the primary study area.

The Pacific fisher survey results provide additional information on habitat use and distribution of the species in Northern California. The survey findings represent the southeastern-most Pacific fisher occurrences in the Klamath region. Additionally, these findings show Pacific fishers in areas generally (previously) not considered suitable habitat in California, including open second-growth conifer, hardwood-conifer, and hardwood habitats that have extensive chaparral components. Pacific fishers were also detected in forest habitats that were barren or semi-barren 50 to 60 years ago because of historical copper mining and smelting activities, and near commercial, rural residential, and industrial development areas.

California Red-Legged Frog Assessment Reclamation conducted a California red-legged frog habitat assessment in the Shasta Lake and vicinity portion of the primary study area in 2010. In consultation with USFWS, an assessment area was developed and field surveys of aquatic habitats were conducted in accordance with Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog (USFWS 2005a). The results suggest only one feature may represent potential California red-legged frog breeding habitat. A California red-legged frog habitat assessment report is currently being completed for USFWS review.

Upper Sacramento River (Shasta Dam to Red Bluff) A list of special-status wildlife species with potential to occur within the primary study area from Shasta Dam to RBPP was compiled based on habitat suitability and known occurrences within the Shasta Dam, Redding, Enterprise, Cottonwood, Balls Ferry, Bend, and Red Bluff East U.S. Geological Survey (USGS) 7.5-minute quadrangle maps (CNDDB 2012, USFWS 2007b). This list also includes species that are identified by USFS as sensitive or endemic, identified by BLM as sensitive, designated by the *Northwest Forest Plan* as survey and manage, or designated as MSCS covered species (see Attachment 4). Species that are federally listed or State-listed are described in more detail below and listed in Table 1-5, as are other special-status species that may occur in riparian or wetland habitats that could be affected by altered flows caused by the project.

Table 1-5. Special-Status Wildlife Species Known or with Potential to Occur in the Primary Study Area, Along the Sacramento River from Shasta Dam to Red Bluff Diversion Dam

Common Name	Scientific Name	Status	Potential for Occurrence
Invertebrates			
Conservancy fairy shrimp	*Branchinecta conservatio*	FE, MSCS	Unlikely to occur. No suitable habitat is present along the river corridor.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FPD, FT, MSCS	Known to occur. Elderberry shrubs are present within the riparian woodland community along the Sacramento River.
Vernal pool tadpole shrimp Critical Habitat	*Lepidurus packardi*	FE, MSCS	Unlikely to occur. No suitable habitat is present along the river corridor. Critical habitat does not occur within the river corridor.
Vernal pool fairy shrimp Critical Habitat	*Branchinecta lynchi*	FT, MSCS	Unlikely to occur. No suitable habitat is present along the river corridor. Critical habitat does not occur within the river corridor.
Amphibians			
Shasta salamander	*Hydromantes shastae*	CT, BLM S, USFS S	Unlikely to occur. Suitable habitat generally is not found within the river corridor downstream from Shasta Dam.
California red-legged frog	*Rana aurora draytonii*	FT, CSC, MSCS	Unlikely to occur. No longer occurs on the floor of the Central Valley.
Foothill yellow-legged frog	*Rana boylii*	CSC, USFS S, MSCS	Unlikely to occur in the Sacramento River due to lack of suitable substrate and hydrology.
Western spadefoot toad	*Spea hammondii*	CSC, MSCS	Unlikely to occur. No suitable habitat is present along the Sacramento River corridor.
Reptiles			
Giant garter snake	*Thamnophis gigas*	FT, ST, MSCS	Unlikely to occur in the primary study area; however, known to occur in the extended study area.
Western pond turtle	*Actinemys (Clemmys) marmorata*	CSC, USFS S, MSCS	Known to occur. Suitable habitat is present in the primary study area.
Birds			
Cackling goose (Aleutian Canada goose)	*Branta hutchinsii leucopareia*	FD, MSCS	Unlikely to occur within banks of the Sacramento River where flows could be altered.
American peregrine falcon (nesting)	*Falco peregrinus anatum*	CP, USFS S, MSCS	Unlikely to nest in this portion of the study area; however, may forage in areas of open water with large concentrations of waterbirds.
Bald eagle (nesting and wintering)	*Haliaeetus leucocephalus*	FD, CE, CP, USFS S, MSCS	Known to occur along the Sacramento River within the primary study area.
Bank swallow (nesting)	*Riparia riparia*	CT, MSCS	Known to occur along the Sacramento river in the primary and extended study areas.
Black-crowned night heron (rookery)	*Nycticorax nycticorax*	BLM S, MSCS	Could nest in trees adjacent to the Sacramento River.

Table 1-5. Special-Status Wildlife Species Known or with Potential to Occur in the Primary Study Area, along the Sacramento River from Shasta Dam to Red Bluff Diversion Dam (contd.)

Common Name	Scientific Name	Status	Potential for Occurrence
Birds (contd.)			
California gull (nesting colony)	*Larus californicus*	MSCS	Not within breeding range. Could occur in the study area during winter or migration.
Cooper's hawk (nesting)	*Accipiter cooperii*	MSCS	Could occur. Suitable nesting and foraging habitat is present in the study area.
Double-crested cormorant (rookery)	*Phalacrocorax auritus*	MSCS	Could nest in trees adjacent to the Sacramento River.
Golden eagle	*Aquila chrysaetos*	CP, BLM S, MSCS	No suitable nesting habitat along the Sacramento River. Unlikely to forage along the river corridor.
Great blue heron (rookery)	*Ardea herodius*	MSCS	Could nest in trees adjacent to the Sacramento River.
Great egret (rookery)	*Casmerodius albus*	MSCS	Could nest in trees adjacent to the Sacramento River.
Greater sandhill crane (nesting and wintering)	*Grus canadensis tabida*	CT, CP, MSCS	Unlikely to breed in the study area. Unlikely to use the Sacramento River corridor during winter or migration.
Least bittern (nesting)	*Ixobrychus exilis*	CSC, MSCS	Could nest along the Sacramento River if suitable habitat is present.
Lesser sandhill crane (wintering)	*Grus canadensis canadensis*	CSC	Does not breed in California. Unlikely to use the Sacramento River corridor during winter or migration.
Little willow flycatcher (nesting)	*Empidonax traillii brewsteri*	CE, MSCS	Unlikely to breed in the study area due to elevation, but may use riparian woodlands during migration.
Loggerhead shrike (nesting)	*Lanius ludovidianus*	CSC	Likely to nest and forage in woodlands and scrub habitats in the study area.
Long-billed curlew (nesting)	*Numenius americanus*	MSCS	Does not breed in the study area. Unlikely to use the Sacramento River corridor during winter or migration.
Long-eared owl (nesting)	*Asio otus*	CSC, MSCS	Does not nest in lowland Central Valley areas. Unlikely to forage along the Sacramento River corridor where flows would be altered.
Northern harrier (nesting)	*Circus cyaneus*	CSC, MSCS	Likely to occur. Suitable nesting and foraging habitat is present in the study area.
Northern spotted owl (nesting) Critical Habitat	*Strix occidentalis caurina*	FT, MSCS	Unlikely to occur along the Sacramento River corridor due to lack of suitable habitat. Critical habitat does not occur in the project area.

Table 1-5. Special-Status Wildlife Species Known or with Potential to Occur in the Primary Study Area, along the Sacramento River from Shasta Dam to Red Bluff Diversion Dam (contd.)

Common Name	Scientific Name	Status	Potential for Occurrence
Birds (contd.)			
Osprey (nesting)	*Pandion haliaetus*	MSCS	Known to nest along the Sacramento River within the primary study area.
Purple martin (nesting)	*Progne subis*	CSC	Could occur. Potentially suitable habitat is present along the Sacramento River corridor.
Short-eared owl (nesting)	*Asio flammeus*	CSC, MSCS	Could occur. Potentially suitable habitat is present within the primary study area.
Snowy egret (rookery)	*Egretta thula*	MSCS	Could nest in trees adjacent to the Sacramento River.
Swainson's hawk (nesting)	*Buteo swainsoni*	CT, USFS S, MSCS	Could occur. Suitable nesting and foraging habitat is present in the study area.
Tricolored blackbird (nesting colony)	*Agelaius tricolor*	CSC, MSCS	Could occur. Potentially suitable habitat is present in the primary study area.
Western yellow-billed cuckoo (nesting)	*Coccyzus americanus occidentalis*	FC, CE, USFS S, MSCS	Likely to nest and forage in the primary study area.
Western burrowing owl (burrow sites)	*Athene cunicularia hypugea*	CSC, MSCS	Unlikely to occur along the Sacramento River corridor due to a lack of suitable nesting habitat.
White-tailed kite (nesting)	*Elanus leucurus*	CP, MSCS	Likely to occur. Suitable nesting and foraging habitat is present in the study area.
Yellow-breasted chat (nesting)	*Icteria virens*	CSC, MSCS	Likely to nest and forage in the primary study area
Yellow warbler (nesting)	*Setophaga (Dendroica) petechia*	CSC, MSCS	Could nest and forage in the primary study area. Likely to use riparian woodlands during migration.
Mammals			
Pacific fisher	*Martes pennanti*	FC, CSC, USFS S	Unlikely to occur. No suitable habitat along the Sacramento River corridor.
Pallid bat	*Antrozous pallidus (roosting)*	CSC, BLM S, USFS S	Could occur. Potentially suitable habitat is present in woodland in the primary study area.
Ringtail	*Bassariscus astutus*	CP, MSCS	Could occur. Potentially suitable habitat is present along the Sacramento River corridor.
Western mastiff bat (roosting)	*Eumops perotis californicus*	CSC, BLM S, MSCS	Unlikely to roost along the Sacramento River corridor because suitable roost sites are lacking.

Table 1-5. Special-Status Wildlife Species Known or with Potential to Occur in the Primary Study Area, along the Sacramento River from Shasta Dam to Red Bluff Diversion Dam (contd.)

Common Name	Scientific Name	Status	Potential for Occurrence
Mammals (contd.)			
Western red bat	*Lasiurus blossevillii*	CSC, USFS S	Could occur. Potentially suitable habitat is present in woodland in the primary study area.
Sierra Nevada red fox	*Vulpes vulpes necator*	CT, USFS S	Unlikely to occur within the project area because the vegetation communities are different than preferred and the area is generally below the preferred elevation range.

Sources: CNDDB 2012; USFWS 2011; USFS 2007; CALFED 2000a; Shuford and Gardali 2008

Key:
BLM S = U.S. Bureau of Land Management sensitive
FC = Federal candidate for listing
FD = Federally delisted
FE = Federally listed as endangered
FT = Federally listed as threatened
FPD = Proposed for Federal delisting
CE = California endangered
CP = California fully protected
CSC = California species of special concern
CT = California Threatened
USFS S = USFS sensitive
MSCS = Multi-Species Conservation Strategy covered species

Figures 1-6a through 1-6j show the locations of special-status wildlife species reported to the CNDDB along the Sacramento River from Shasta Dam to RBPP.

The special-status species listed in Table 1-5 were identified as having the potential to occur in the upper Sacramento River portion of the primary study area. Some species included in Table 1-5 are not expected to occur in this portion of the primary study area because of lack of suitable habitat. The following section describes special-status species that are known or are likely to occur between Shasta Dam and RBPP. Species accounts for each federally listed or State-listed species that could occur are provided below. Species accounts for nonlisted species of special concern that could occur between Shasta Dam and RBPP are provided in Attachment 4.

The five federally listed or State-listed species that could occur in the primary study area downstream from the reservoir are the following:

- Bald eagle
- Bank swallow
- Swainson's hawk
- Valley elderberry longhorn beetle
- Western yellow-billed cuckoo

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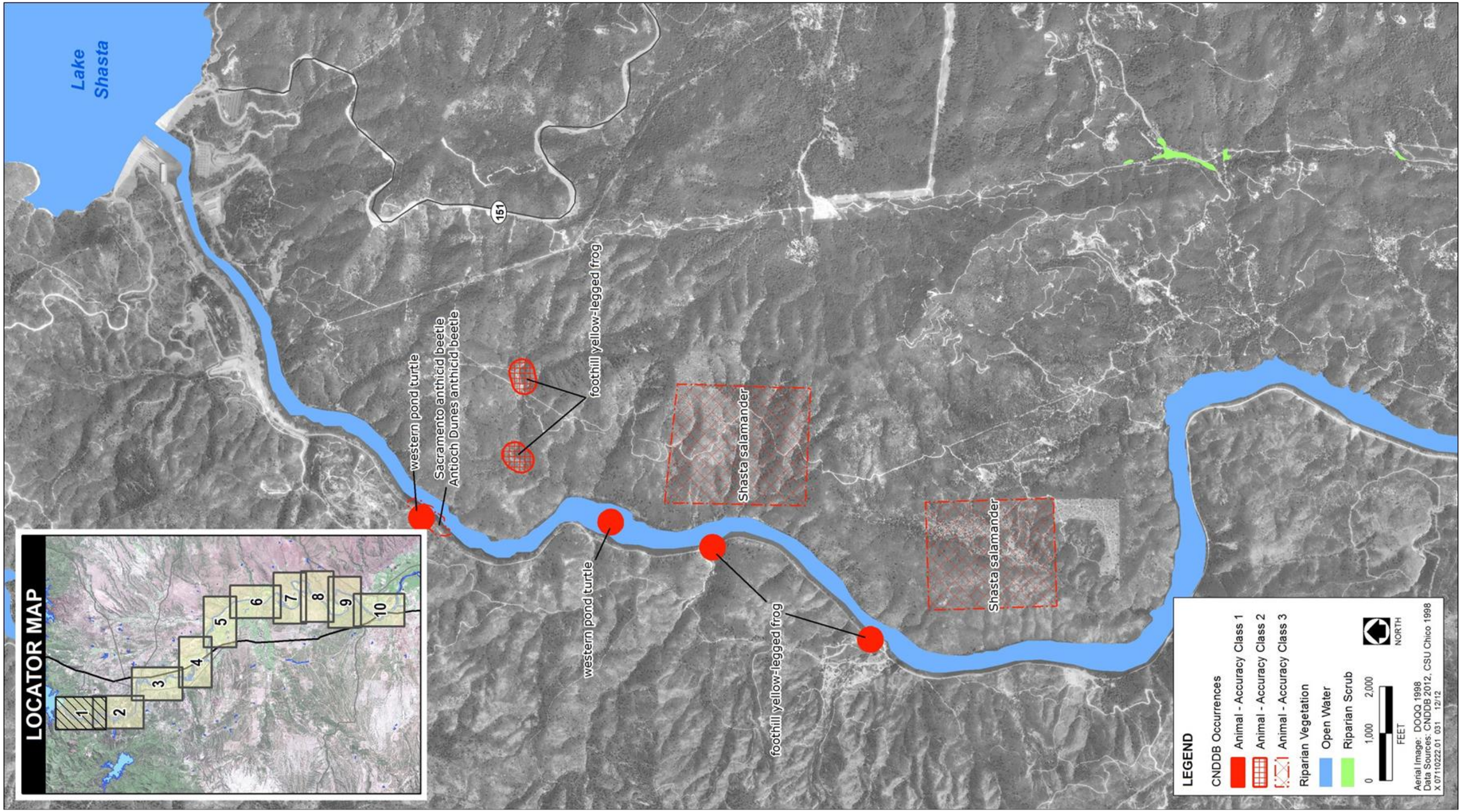

Figure 1-6a. Sensitive Biological Resources Between Shasta Dam and Red Bluff Pumping Plant

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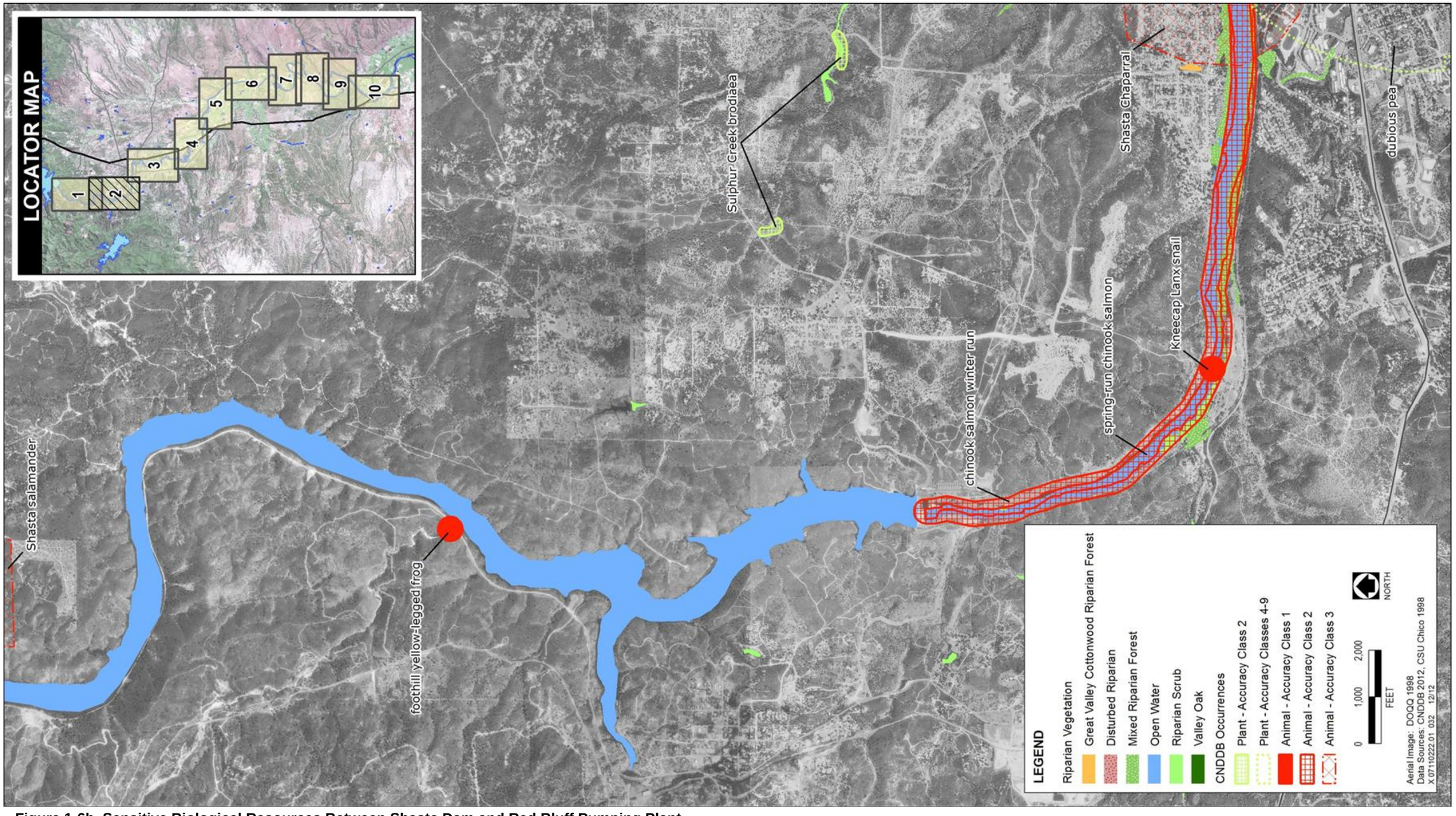

Figure 1-6b. Sensitive Biological Resources Between Shasta Dam and Red Bluff Pumping Plant

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Figure 1-6c. Sensitive Biological Resources Between Shasta Dam and Red Bluff Pumping Plant

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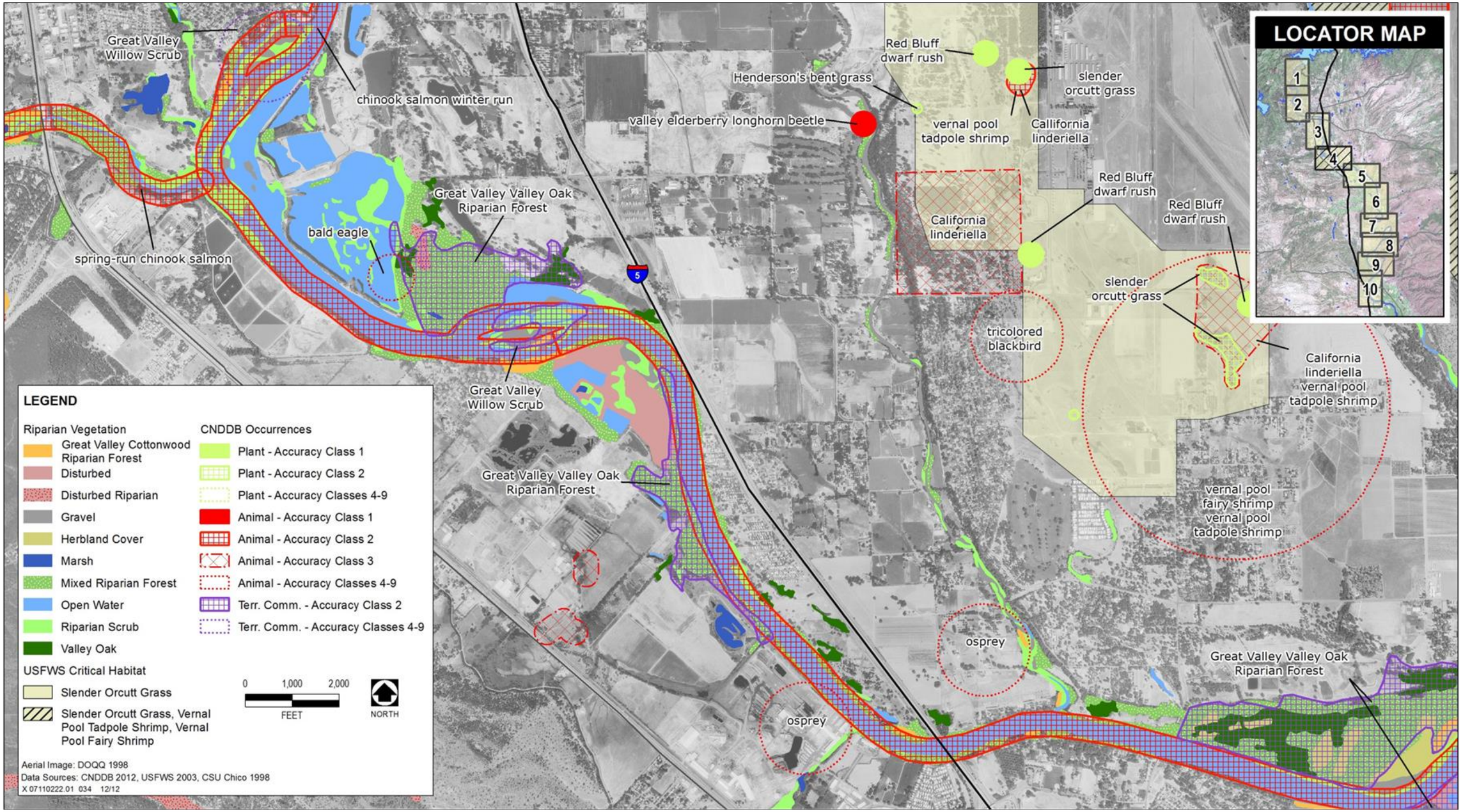

Figure 1-6d. Sensitive Biological Resources Between Shasta Dam and Red Bluff Pumping Plant

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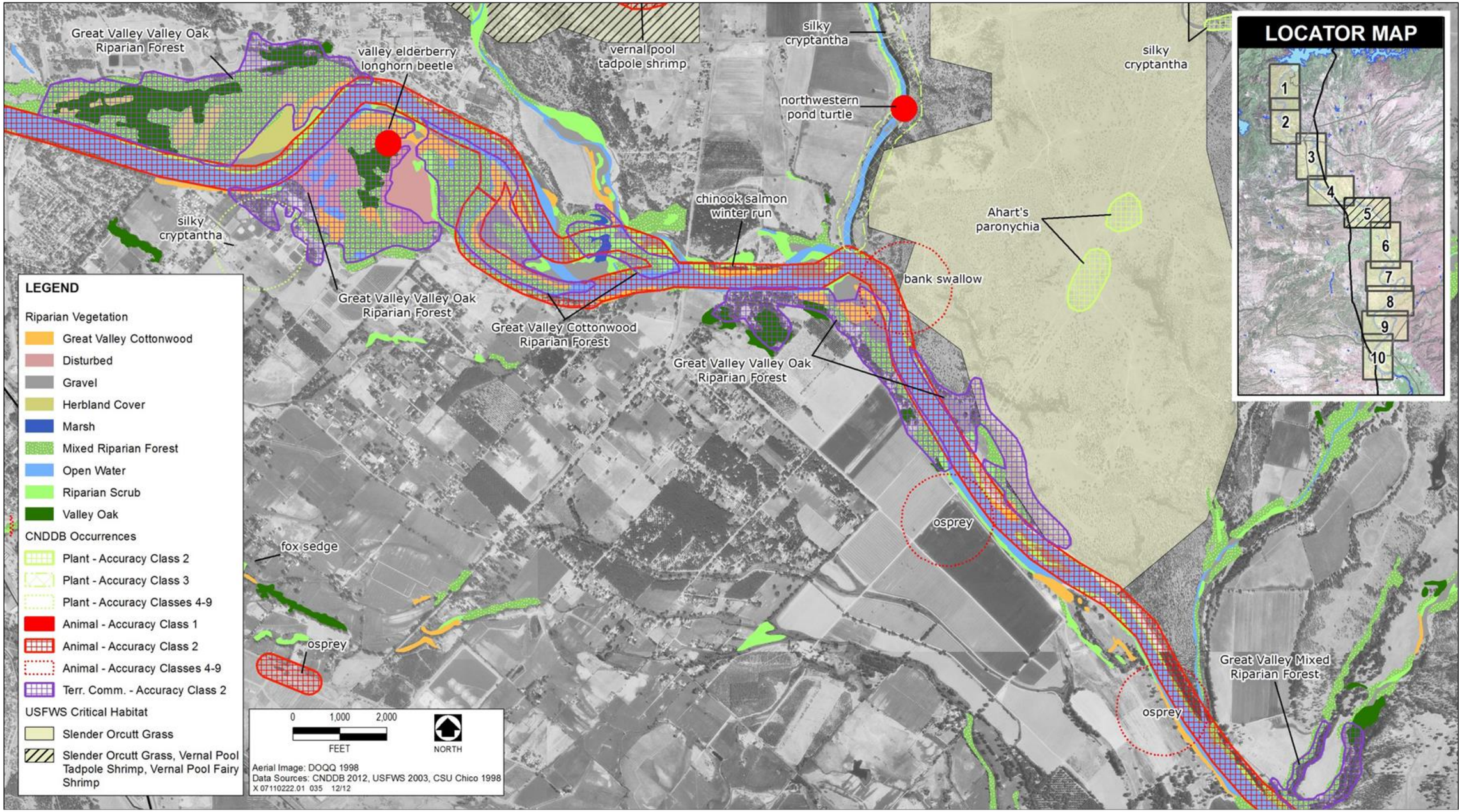

Figure 1-6e. Sensitive Biological Resources Between Shasta Dam and Red Bluff Pumping Plant

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Figure 1-6f. Sensitive Biological Resources Between Shasta Dam and Red Bluff Pumping Plant

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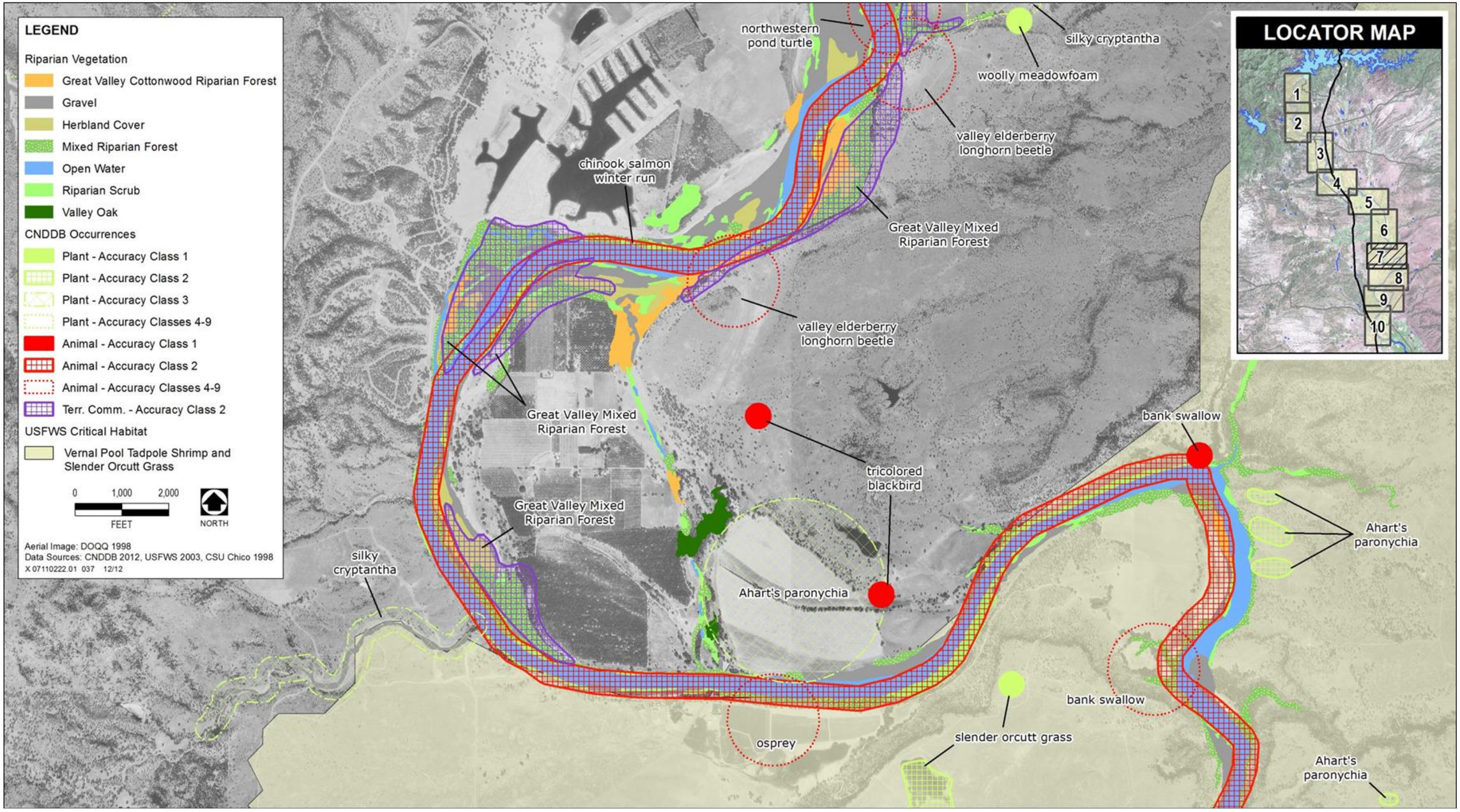

Figure 1-6g. Sensitive Biological Resources Between Shasta Dam and Red Bluff Diversion Dam

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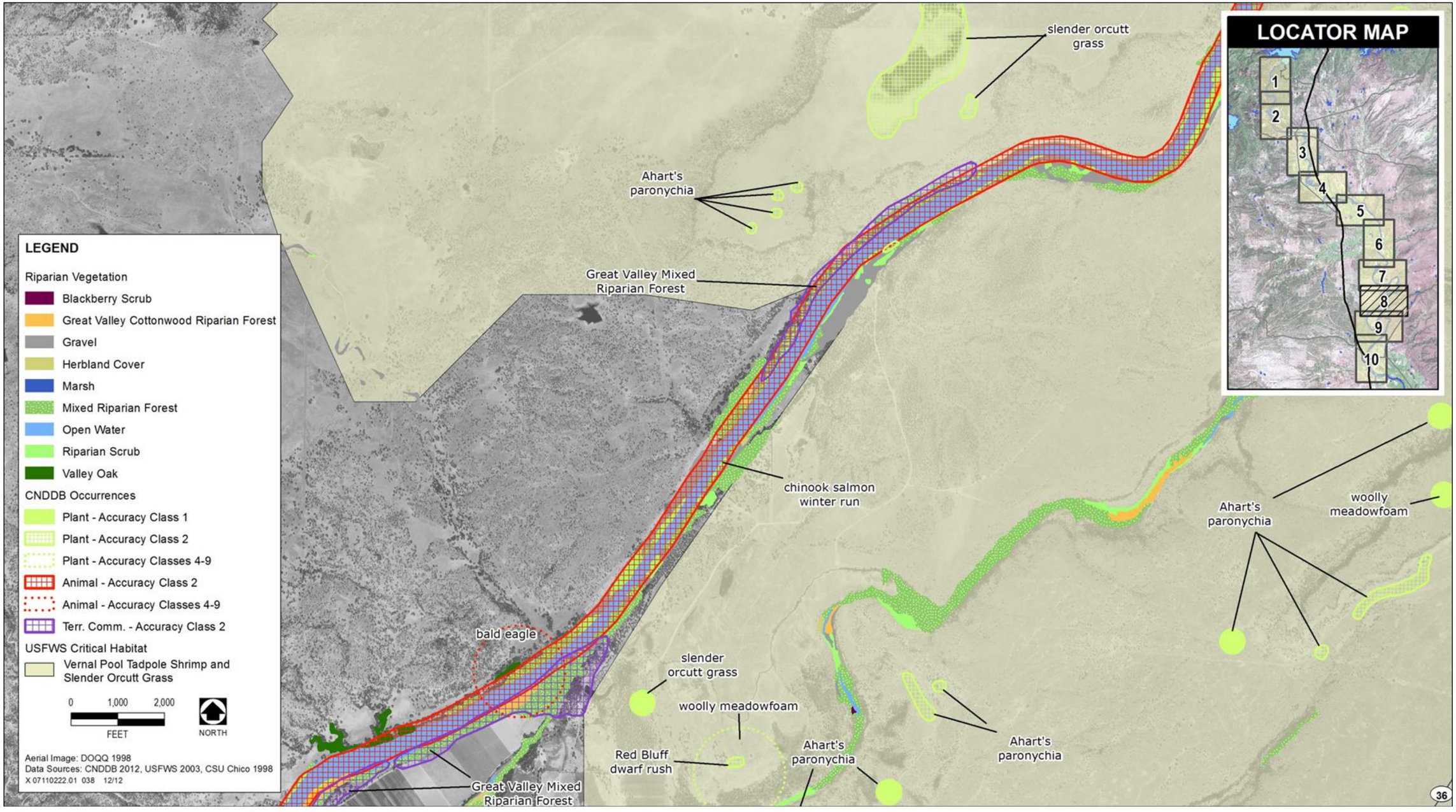

Figure 1-6h. Sensitive Biological Resources between Shasta Dam and Red Bluff Pumping Plant

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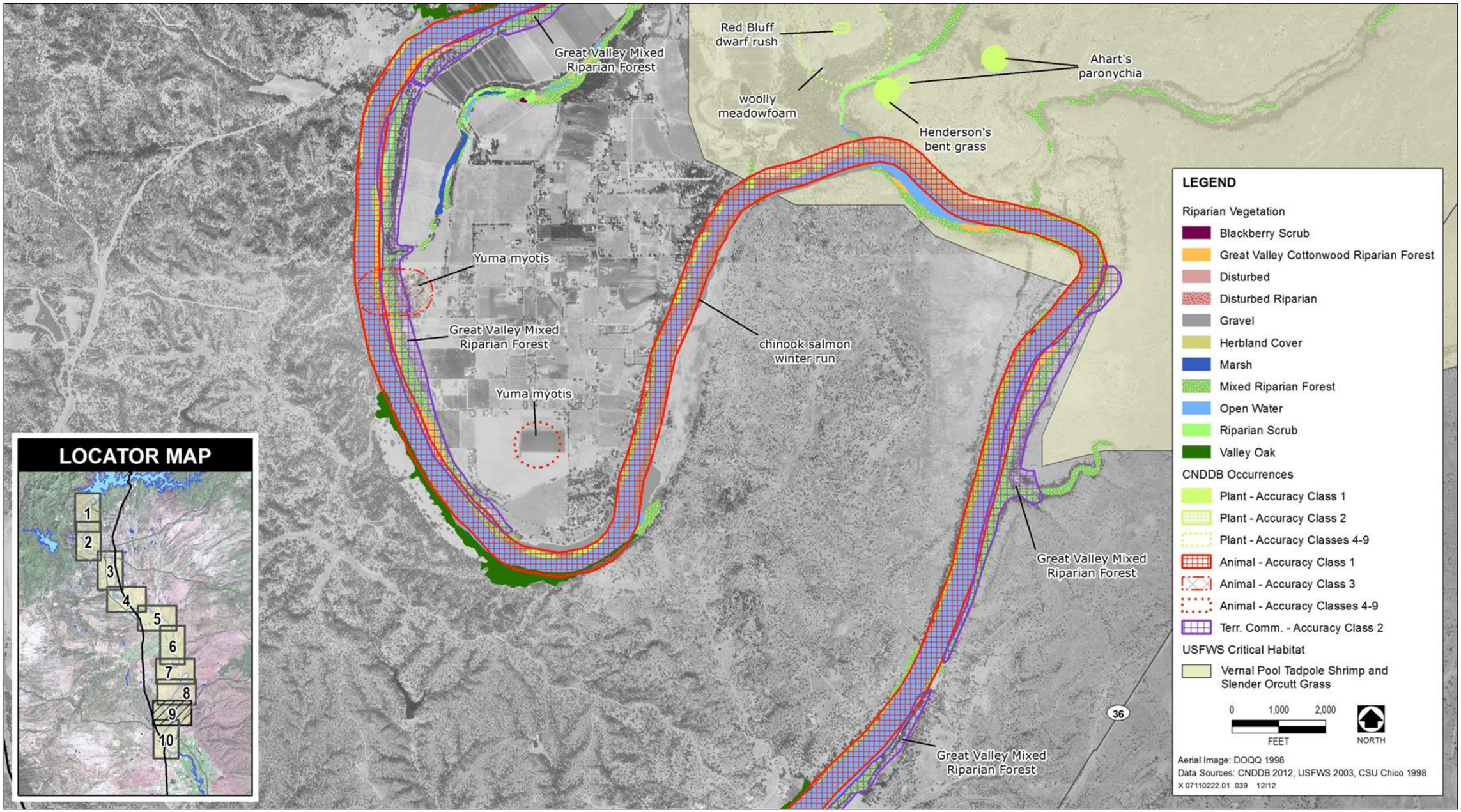

Figure 1-6i. Sensitive Biological Resources between Shasta Dam and Red Bluff Pumping Plant

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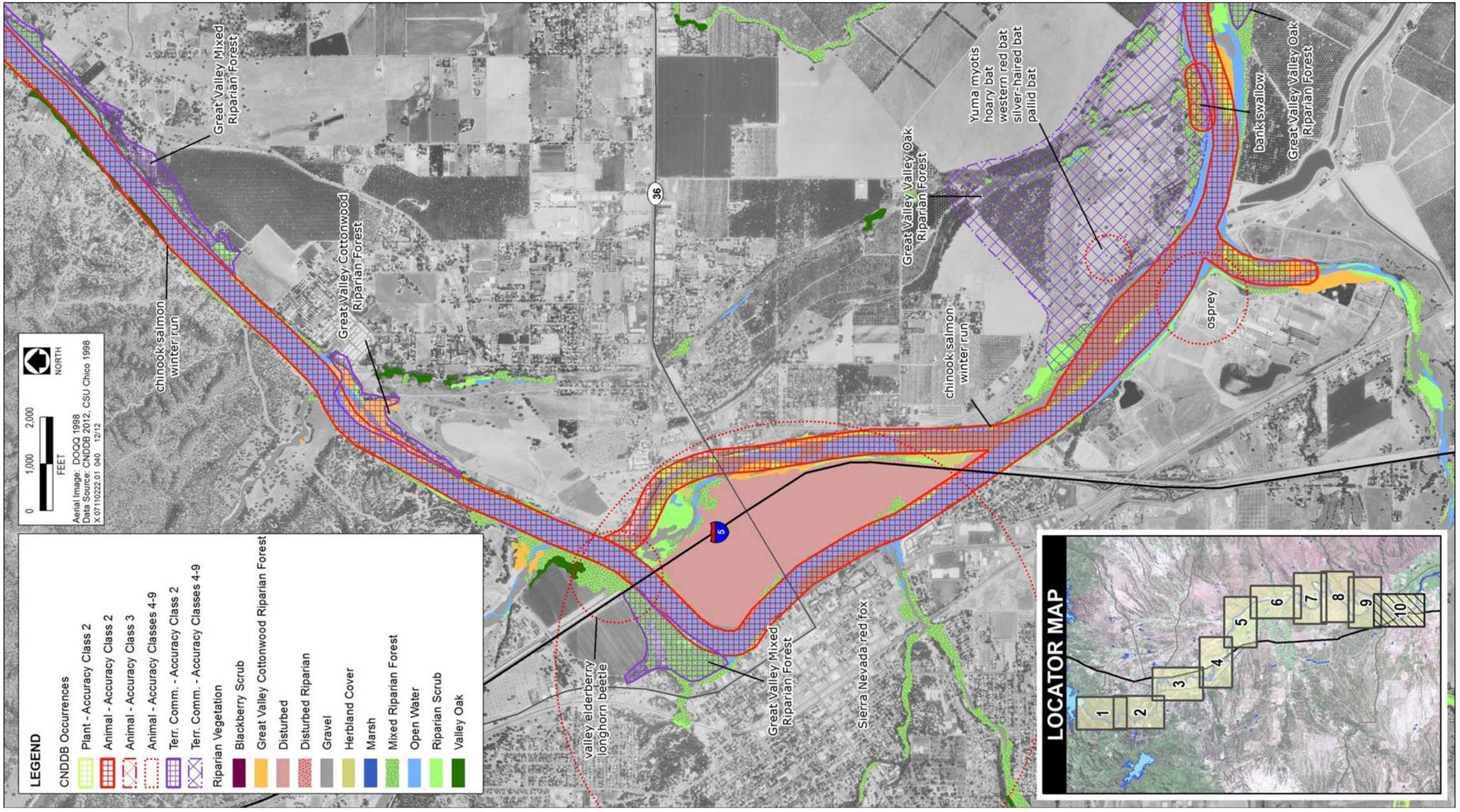

Figure 1-6j. Sensitive Biological Resources between Shasta Dam and Red Bluff Diversion Dam

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Bald Eagle The bald eagle has been delisted from the Federal Endangered Species Act (ESA), but is still listed as endangered under the California Endangered Species Act (CESA). This species nests in tall trees or on cliffs near rivers and lakes. It nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino counties and in the Tahoe basin. The species' winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County. Bald eagles are also known to nest along the riparian corridor of the primary study area.

Bank Swallow The bank swallow is State-listed as threatened. This species nests in bluffs or banks, usually adjacent to water. It occurs along the Sacramento River from Tehama County to Sacramento County, along the Feather and lower American rivers, in the Owens Valley, and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou counties. Small populations of this species are also found near the coast from San Francisco County to Monterey County. It is known to occur in at least 7 locations along the Sacramento River in the primary study area, and extant populations are reported in approximately 100 locations in the extended study area (CNDDB 2012).

Bank swallow was identified as one of two wildlife indicator species (the other being western pond turtle) in the "Linkages Report" for the Sacramento River Ecological Flows Study (Stillwater Sciences 2007). The goal of this study was to define how flow characteristics and associated management actions influence the creation and maintenance of habitats for a number of native species that occur in the Sacramento River corridor. Bank erosion is an important habitat feature for bank swallows to find suitable nesting sites. Erosion in the winter resulting from high volume and/or velocity flows is important to create nesting habitat. However, high flows during the breeding season (beginning in late March), when bank swallow nests may be present, can cause banks to erode and result in nest destruction. Flood control and bank protection projects can also reduce bank swallow habitat availability. The following information about bank swallow is excerpted from the report:

> *There has been a general decline in the total number of bank swallow burrows, colonies, and estimated breeding pairs found between Redding and Verona (RM (River Mile) 292–81) since 1986. The Sacramento River and its tributaries harbor approximately 70 percent of California's bank swallow nesting locations (Hight 2000).*
>
> *High flows during nesting season are generally infrequent in the Sacramento River but nevertheless have the potential to adversely affect bank swallow colonies. Although there is general disagreement on the exact magnitude of the flow required to initiate substantial bank erosion, growing evidence*

> *suggests that flows in the 20,000–25,000 cfs [cubic feet per second] range will typically erode some banks, causing partial bank collapse that can result in localized nest failure if swallows are present. Flows above 50,000–60,000 cfs are almost certain to cause widespread bank erosion. This can lead to partial or complete colony failure at many sites if breeding bank swallows are present.*

The installation of riprap and concrete in bank armoring activities can have the immediate effect of reducing the availability of sufficiently steep, suitably textured habitat for bank swallow nesting colonies. Overall, an estimated 48 percent of the channel from Red Bluff to Colusa (RM 243–143) is now covered by riprap on at least one side (Larsen and Greco 2002; S. Greco, unpublished data). However, bank revetment has been preferentially applied to actively migrating bends which would otherwise be among the most suitable sites for bank swallow nests. Hence, it is likely that bank revetment has eliminated substantially more than 48 percent of potential nesting sites between Red Bluff and Colusa. Plans for new bank revetment projects on the Sacramento River continue to be developed. If implemented, these projects would further reduce available habitat, and thus add to the already high overall effect of bank revetment on the bank swallow population (Schlorff 2004).

A levee-removal project was completed on the mainstem Sacramento River at RM 233 in late fall 1999 (Golet et al. 2003). Erosion in the mid-1990s had already damaged and washed out the riprap that had been installed at the site by the landowner. Further erosion in the winter of 2000 expanded the existing cut bank, and a swallow colony was established there in the following spring. The newly established colony, with 2,770 burrows, was the largest on the river that year. It represented a substantial expansion for bank swallows at the site, which had supported just 930 burrows in the previous year.

Swainson's Hawk Swainson's hawk is State-listed as a threatened species. This species nests in oaks or cottonwoods in or near riparian habitats, and it forages in grasslands, irrigated pastures, and grain fields. This species occurs throughout the lower Sacramento and San Joaquin valleys, the Klamath basin, and Butte Valley. Potential nest trees for this species occur along the riparian corridor of the primary study area.

Valley Elderberry Longhorn Beetle The valley elderberry longhorn beetle is federally listed as threatened. Its obligate host plant, the elderberry (*Sambucus* sp.), occurs in riparian and oak savanna habitats below 3,000 feet throughout the Central Valley. This species is known to occur in several locations along the riparian corridor of the primary study area. Potential habitat (i.e., the elderberry shrub) is a common component of riparian communities in the study area.

Western Yellow-Billed Cuckoo The western yellow-billed cuckoo is a candidate species for Federal listing and is State-listed as endangered. It inhabits

wide, dense riparian forest and scrub where there is a thick understory of willows for nesting. It prefers sites with a dominant cottonwood overstory for foraging. It may avoid valley-oak riparian habitats where scrub jays are abundant. This species nests along the upper Sacramento, lower Feather, south fork of the Kern, Amargosa, Santa Ana, and Colorado rivers.

State Species of Special Concern Several State species of special concern (i.e., purple martin, yellow warbler, and yellow-breasted chat) are likely or are known to occur in riparian habitats in the primary study area. Other State species of special concern (i.e., least bittern, northern harrier, short-eared owl, tricolored blackbird, and western pond turtle) are likely or known to be found in emergent wetlands and marsh habitats adjacent to the riparian corridor of the primary study area. Open woodlands or scrub vegetation could provide nesting habitat for loggerhead shrike and white-tailed kite and denning or roosting habitat for pallid bat, ringtail, and western red bat.

Of particular importance along the Sacramento River corridor is the western pond turtle, which serves as an indicator species because it uses many of the habitat types along the river corridor (Stillwater Sciences 2007). The western pond turtle is California's only native freshwater turtle. The habitat needs of this species are diverse. Along major alluvial river systems, such as the Sacramento River, it uses oxbow lakes, sloughs, and other off-channel water bodies for foraging and rearing. Main-channel habitats are used for aquatic dispersal and at least occasionally for foraging and basking. Upland areas, including grasslands, oak woodlands, and gaps in riparian forests, also are used for nesting, dispersal, and overwintering. Thus, the habitats of western pond turtles are used by many species, which together contribute to the overall diversity of wildlife along the Sacramento River corridor. Western pond turtle habitats have likely been reduced in extent and quality from historical conditions as a function of land use changes that have converted habitat to agriculture and urban development. They have also likely been reduced as a result of dam construction and operations; by altering flow and sediment regimes, dam construction and operations have reduced bank erosion and meander migration, thereby affecting the formation of off-channel habitats that appear to provide the majority of the aquatic habitat for western pond turtle in the Sacramento River corridor (Stillwater Sciences 2007).

Extended Study Area

The extended study area consists of the lower Sacramento River and Delta, major tributaries and floodplain bypasses, and the CVP/SWP service areas. Habitats in each of these areas are described below. Special-status wildlife species associated with habitat in these areas are also discussed.

Lower Sacramento River and Delta

The roughly 300 miles of the Sacramento River can be subdivided into distinct reaches. These reaches are discussed separately below because of differences in morphology, riparian vegetation, and habitat functions. This section focuses on the reaches of the mainstem Sacramento River from RBPP to Colusa, from

Colusa to the Delta, and in the Delta. Each of these reaches is discussed individually along with the main tributaries and floodplain bypasses to the Sacramento River. (See the *Fisheries and Aquatic Ecosystem Technical Report* for more information.)

Lower Sacramento River

Red Bluff Diversion Dam to Colusa In this reach, the Sacramento River is classified as a meandering river, where relatively stable, straight sections alternate with more sinuous, dynamic sections (Resources Agency 2003). The active channel is fairly wide in some stretches and the river splits into multiple forks at many different locations, creating gravel islands often with riparian vegetation. Historic bends in the river are visible throughout this reach and appear as scars of the historic channel locations with the riparian corridor and oxbow lakes still present in many locations. Well-developed riparian woodland occurs in many locations. The channel remains active and has the potential to migrate in times of high water. Point bars, islands, high and low terraces, instream woody cover, early successional riparian plant growth, and other evidence of river meander and erosion are common in this reach.

Colusa to the Delta The general character of the Sacramento River changes quite drastically downstream from Colusa from a dynamic and active meandering channel to a confined, narrow channel restricted from migration. Surrounding agricultural lands encroach directly adjacent to the levees, which have cut the river off from the majority of its riparian corridor, especially on the eastern side of the river. The majority of the levees in this reach are lined with riprap, allowing the river no erodible substrate and limiting the extent of riparian vegetation.

Primary Tributaries to the Lower Sacramento River Primary tributaries to the lower Sacramento River are the Feather and American rivers; each is described separately below.

Lower Feather River The aquatic and riparian ecosystems of the lower Feather River are influenced by DWR Oroville Facilities downstream to the confluence with the Sacramento River at Verona. The upper extent is fairly confined by levees as it flows through the city of Oroville. Downstream from Oroville, the Feather River is fairly active and meanders its way south to Marysville. However, this stretch is bordered by active farmland, which confines the river into an incised channel in certain stretches and limits the width of riparian woodland. Relatively large areas of adjacent farmlands are in the process of being restored to floodplain habitat with the relocation of levees to become setback levees.

Lower American River The lower American River (downstream from Folsom and Nimbus dams) is fairly low gradient and provides a variety of aquatic and riparian habitats. The majority of the lower American River is

surrounded by the American River Parkway, preserving the surrounding riparian zone. The river channel does not migrate to a large degree because of the geologic composition that has allowed the river to incise deep into sediments, leaving tall cliffs and bluffs adjacent to the river.

Sacramento River Floodplain Bypasses There are multiple water diversion structures in the lower Sacramento River that move floodwaters into floodplain bypass areas during high-flow events. Primary floodplain bypass areas include the Butte basin, Sutter Bypass, and Yolo Bypass. These bypasses provide broad, inundated floodplain habitat during wet years. Unlike other Sacramento River and Delta habitats, floodplains and floodplain bypasses are seasonally dewatered (as high flows recede) during late spring through autumn and provide important habitat for migrating waterfowl and shorebirds.

Lower San Joaquin and Stanislaus Rivers The lower San Joaquin River is characterized by a relatively wide (approximately 300 feet) channel with little canopy or overhead vegetation and minimal bank cover. Aquatic habitat in the San Joaquin River is characterized primarily by slow-moving water and with limited water clarity and overall low habitat diversity. Aquatic and riparian habitats of the downstream portions of the Stanislaus River are more varied, in association with the development of levees and encroachment of agriculture and urban uses. Flows in both river systems are highly altered and are managed for flood control and water supply purposes.

Special-Status Species Most of the special-status wildlife species listed in Table 1-5 have the potential to occur within the extended study area. Numerous additional special-status wildlife species could occur in the extended study area in plant communities that are not present in the primary study area. The potential occurrence of special-status wildlife species is given for each section of the primary and extended study areas in Attachment 6. Additional species that are endemic to the Bay-Delta area, the Delta proper, or the Coast Range, as well as other species whose distribution ranges do not extend into the primary study area could occur in the extended study area. Attachment 7 contains a comprehensive list of all sensitive wildlife species in the extended study area that have been reported to the CNDDB.

Sacramento River from RBPP to the Delta Many of the special-status wildlife species described above for the upper Sacramento River corridor have the potential to occur in the middle and lower reaches of the Sacramento River.

Before the habitat and community changes that resulted from human settlement and development along the Sacramento River, several animals were present that have since been extirpated from the region. However, numerous special-status wildlife species still occur along the Sacramento River from RBPP to the Delta. The majority of the special-status wildlife species are associated with grasslands, freshwater emergent wetlands, lakes, rivers, and riparian vegetation on the valley floor. Many of these species have been listed by Federal and State

wildlife agencies because of habitat loss associated with agricultural development and water projects. Wildlife species listed under the Federal ESA and/or CESA that have potential to occur in a portion of the extended study area from RBPP to the Delta include valley elderberry longhorn beetle, giant garter snake (*Thamnophis gigas*), bald eagle, Swainson's hawk, western yellow-billed cuckoo, willow flycatcher, and bank swallow. Information about these and other special-status species is provided in the CALFED MSCS (CALFED 2000a).

Sacramento-San Joaquin River Delta Many special-status species are known or are likely to occur in the Delta because of the presence of unique wetland habitats there. Generally, the existing distribution of wildlife species in the Delta is closely linked with the distribution of one or more habitat types on which a species depends. Dozens of special-status wildlife occur in the Delta region. Most of the special-status wildlife species are associated with freshwater emergent wetlands, marshes, open water, and agricultural lands. Tidal marshes and emergent wetlands support several special-status wildlife species, including the California black rail (*Laterallus jamaicensis coturniculus*), California clapper rail (*Rallus longirostris obsoletus*), greater sandhill crane, salt marsh common yellowthroat (*Geothlypis trichas sinuosa*), salt marsh harvest mouse (*Reithrodontomys raviventris*), Suisun ornate shrew (*Sorex ornatus sinuosus*), Suisun song sparrow (*Melospiza melodia maxillaris*), and tricolored blackbird. The giant garter snake is known to inhabit sloughs, canals, and low-gradient streams and freshwater marshes in the Delta. Vernal pools and other freshwater seasonal wetlands support several special-status crustaceans, including vernal pool tadpole shrimp and vernal pool fairy shrimp. Although it is severely declining because of a dramatic shrinkage of suitable habitat, the valley elderberry longhorn beetle has been found in the Delta region on McCormack-Williamson and New Hope Tracts. Information about these and other special-status species is provided in the CALFED MSCS and Ecosystem Restoration Program Plan (CALFED 2000a, 2000b) and the Baylands Ecosystem Species and Community Profiles (Goals Project 2000).

San Joaquin River Basin to the Delta Changes in the natural landscape of the San Joaquin River region have substantially affected plant and wildlife species. Thus, 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. Because animals are highly dependent on specific habitats, changes in the quality and quantity of various habitat types have affected the area of habitat for many wildlife species. Conversion of grasslands to row crops has favored species that have adapted to the use of agricultural fields for foraging and species that can thrive in the altered landscape; however, many special-status wildlife species live in the periphery of these areas.

Remnant patches of native vegetation are likely to support a high diversity of wildlife species. More than 100 special-status wildlife and plants occur in the San Joaquin River region. The largest number of special-status plant species occurs in grassland and valley foothill woodland. Most of the special-status

wildlife species are associated with grasslands (which include vernal pools), freshwater emergent wetlands, lakes, and rivers that occur on the valley floor. Many of these special-status species have been listed by Federal and State wildlife agencies because of habitat losses associated with agricultural development and water projects. Information on these and other special-status species is provided in the CALFED MSCS (CALFED 2000a).

CVP/SWP Service Areas The CVP/SWP service areas are dominated by agricultural land and urban development, which can support many wildlife species, most of which are highly adapted to these disturbed environments. The conflict between urban growth and conservation of native habitat has resulted in the listing of a number of wildlife species that have been threatened with extinction. Many of these special-status wildlife species are unable to adapt to other habitat types or altered habitat conditions. The region also supports a variety of nonnative species, some of which are detrimental to survival of native species. Generally, the lowest diversity of native wildlife species occurs in densely urbanized areas. Special-status wildlife occurs in both large and small blocks of habitat, while some large mammals and secretive species are generally found only on large undisturbed parcels.

Changes in the natural landscape in the CVP/SWP service areas greatly reduced the distribution and abundance of wildlife species. The California condor (*Gymnogyps californianus*), lightfooted clapper rail (*Rallus longirostris levipes*), California least tern (*Sternula antillarum brownie*), least Bell's vireo (*Vireo bellii pusillus*), Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), southwestern willow flycatcher (*Empidonax traillii extimus*), California gnatcatcher (*Polioptila californica*), Mohave ground squirrel (*Spermophilus mohavensis*), and Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*) are examples of species that have been listed as threatened or endangered under the ESA and/or CESA and could occur within the CVP/SWP service areas. Attachments 6 and 7 provide tables listing the special-status wildlife species with potential to occur in, or reported to the CNDDB from, the CVP/SWP service areas.

Other Wildlife Resources

Shasta Lake and Vicinity

Critical Deer Range Critical black-tailed deer winter range for the McCloud Flats and Cow Creek herds is located in the Shasta Lake and vicinity portion of the primary study area in all five arms of the lake. Critical fawning range also is found along the south-facing slopes of Little Sugarloaf Creek (CDFG 1998). Critical deer winter range can include movement corridors, staging areas where deer congregate, and habitats with high-quality winter forage or other elements that help deer to survive the winter. Winter ranges are at lower elevations and are fewer in number than summer ranges, and thus are more vulnerable to human impact. Deer from different summer ranges may use common winter

ranges when breeding typically occurs, which contributes to genetic diversity (CDFG 1998).

USFWS HEP Analysis Reclamation is working with USFWS to complete a Habitat Evaluation Procedure (HEP) analysis to help quantify potential project impacts and meet Fish and Wildlife Coordination Act consultation requirements. To date, HEP studies and analyses have been completed for part of the Shasta Lake and vicinity portion of the primary study area. Additional planning and coordination are ongoing.

Incidental Observations Reclamation has maintained a database of special-status wildlife species incidentally observed during all biological surveys performed since 2002. The incidental species observations include the foothill yellow-legged frog, western pond turtle (*Actinemys marmorota marmorata*), osprey (*Pandion haliaetus*), yellow-breasted chat (*Icteria virens*), and yellow warbler (*Dendroica petechia brewsteri*) (Figures 1-4a through 1-4f).

Upper and Lower Sacramento River, Delta, and CVP/SWP Service Areas
For the upper and lower Sacramento River, Delta, and CVP/SWP service areas, no other wildlife resources were evaluated in addition to wildlife habitats, wildlife, and special-status wildlife.

Regulatory Framework

Wildlife resources in California are protected and/or regulated by a variety of Federal and State laws and policies. Key regulatory and conservation planning issues applicable to the project are discussed below.

Federal

Federal Endangered Species Act
Pursuant to the Federal ESA, USFWS and the National Marine Fisheries Service (NMFS) have authority over projects that may result in "take" of a federally listed species. In general, ESA Section 7 prohibits persons (including private parties) from "taking" listed endangered or threatened fish and wildlife species on private property, and from "taking" listed endangered or threatened plant species in areas under Federal jurisdiction or in violation of State law (16 U.S. Code (USC) 1532, 50 Code of Federal Regulations (CFR) 17.3). Under the ESA, the definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" as part of an intentional or negligent act or omission. The term "harm" includes acts that result in death or injury to wildlife. Such acts may include significant habitat modification or degradation if it results in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Section 7(a) of the ESA, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed for

listing or is listed as endangered or threatened. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its designated critical habitat. If a Federal action may affect a listed species or its designated critical habitat, the responsible Federal agency must enter into formal consultation with USFWS or NMFS, depending on the species.

As defined in the ESA, critical habitat is a specific geographic area that is essential for the conservation of a threatened or endangered species and that may require special management and protection. It may include an area that is not currently occupied by the species but that will be needed for its recovery. Critical habitats are designated to ensure that actions authorized by Federal agencies will not destroy or adversely modify designated critical habitat, thereby protecting areas necessary for the conservation of the species.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC 661–667e, as amended) provides the basic authority for the involvement of USFWS in evaluating impacts on fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive consideration equal to that of other project features. It also requires Federal agencies that construct, license, or permit water resource development projects to first consult with USFWS (and NFMS in some instances) and State fish and wildlife agencies regarding the impacts of the proposed action on fish and wildlife resources and measures to mitigate these impacts.

Bald Eagle Protection Act

The bald eagle and golden eagle are federally protected under the Bald Eagle Protection Act (16 USC 668–668c). It is illegal to take, possess, sell, purchase, barter, offer to sell or purchase or barter, transport, export, or import a live or dead bald or golden eagle or any eagle part, nest, or egg unless authorized by the Secretary of the Interior. The Bald Eagle Protection Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" (16 USC 668–668d). USFWS has further defined "disturb" under the act as follows (72 Federal Register (FR) 31132–31140 (June 5, 2007)):

> *Disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.*

Active nest sites are also protected from disturbance during the breeding season, generally February through September.

USFWS has proposed new permit regulations to authorize the take of bald and golden eagles under the Bald Eagle Protection Act, generally where the take to be authorized is associated with otherwise lawful activities (72 FR 31141–31155 (June 5, 2007)). With the delisting of the bald eagle in 2007 from the ESA, this act is the primary law protecting bald eagles and golden eagles. Violators are subject to fines and/or imprisonment for up to 1 year.

Migratory Bird Treaty Act

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703–711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). This prohibition includes direct and indirect acts, although harassment and habitat modifications are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA, which can be found in Title 50, Section 10.13 of the Code of Federal Regulations, includes several hundred species, essentially all native birds. Loss of nonnative species, such as house sparrows (*Passer domesticus*), European starlings (*Sturnus vulgaris*), and rock pigeons (*Columba livia*), is not covered by this statute.

U.S. Forest Service Sensitive Species

The National Forest Management Act requires USFS to "provide for a diversity of plant and animal communities" (16 USC 1604(g)(3)(B)) as part of its multiple-use mandate. USFS must maintain "viable populations of existing native and desired nonnative species in the planning area" (36 CFR 219.19). The Sensitive Species program is designed to meet this mandate and to demonstrate USFS's commitment to maintaining biodiversity on National Forest System lands. The program is a proactive approach to conserving species to prevent a trend toward listing under the ESA and to ensure the continued existence of viable, well-distributed populations. A "Sensitive Species" is any species of plant or animal that has been recognized by the Regional Forester to need special management to prevent the species from becoming threatened or endangered.

Shasta-Trinity National Forest Land and Resource Management Plan

The Shasta-Trinity National Forest (STNF) Land and Resource Management Plan (LRMP) contains forest goals, standards, and guidelines designed to guide the management of STNF. The following goals, standards, and guidelines related to wildlife resource issues associated with the study area were excerpted from the STNF LRMP (USFS 1995).

U.S. Forest Service Survey and Manage

In 1994, BLM and USFS adopted standards and guidelines developed as part of the Northwest Forest Plan. These standards and guidelines address management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. The Northwest Forest Plan was designed to

address human and environmental needs served by the Federal forests of the western part of the Pacific Northwest and Northern California. The development of the Northwest Forest Plan was triggered in the early 1990s by the listing of the northern spotted owl and marbled murrelet as threatened under the ESA.

To mitigate potential impacts on plant and wildlife species that have the potential to occur within the range of the northern spotted owl, surveys are required for species thought to be rare, or whose status is unknown because of a lack of information. These species became known as the Survey and Manage species. The Northwest Forest Plan has gone through several revisions since its implementation in 1994, including the elimination of the Survey and Manage Mitigation Measure Standards and Guidelines in 2004. However, these guidelines were reinstated in January 2006 as the result of a court order.

Biological Diversity

Goals (LRMP, p. 4-4) Integrate multiple resource management on a landscape level to provide and maintain diversity and quality of habitats that support viable populations of plants, fish, and wildlife.

Standards and Guidelines (LRMP, p. 4-14)

- **Natural Openings** – Management of natural openings will be determined at the project level consistent with desired future conditions.

- **Snags** – Over time, provide the necessary number of replacement snags to meet density requirements as prescribed for each land allocation and/or management prescription. Live, green culls and trees exhibiting decadence and/or active wildlife use are preferred.

- **Hardwood** – Apply the following standards in existing hardwood types:

  - Manage hardwood types for sustainability.

  - Conversion to conifers will only take place to meet desired future ecosystem conditions.

  - Where hardwoods occur naturally within existing conifer types on suitable timber lands, manage for a desired future condition for hardwoods as identified during ecosystem analysis consistent with management prescription standards and guidelines. Retain groups of hardwoods over single trees.

- Threatened, Endangered, and Sensitive Species (Plants and Animals)

Goals (LRMP, p. 4-5)

- Monitor and protect habitat for federally listed Threatened and Endangered and candidate species. Assist in recovery efforts for Threatened and Endangered species. Cooperate with the State to meet objectives for state listed species.

- Manage habitat for sensitive plants and animals in a manner that will prevent any species from becoming a candidate for Threatened and Endangered status.

Goals (LRMP, p. 4-6)

- Meet habitat or population objectives established for management indicators.

- Cooperate with Federal, State, and local agencies to maintain or improve wildlife habitat.

- Maintain natural wildlife species diversity by continuing to provide special habitat elements within Forest ecosystems.

Standards and Guidelines (LRMP, pp. 4-29 through 4-30)

- Minimize accidental electrocution of raptors by ensuring that newly constructed overhead power lines meet safe design standards.

- Consider transplants, introductions, or reintroductions of wildlife species only after ecosystem analysis and coordination with other agencies and the public.

- Manage habitat for Neotropical migrant birds to maintain viable population levels.

- Develop interpretation/view sites for wildlife viewing, photography, and study. Provide pamphlets, slide shows, and other educational material that enhance the watchable wildlife and other interpretive programs.

- Maintain and/or enhance habitat for federally listed threatened and endangered or Forest Service Sensitive species consistent with individual species recovery plans.

Management Guide for the Shasta and Trinity Units of the Whiskeytown-Shasta-Trinity National Recreation Area The Management Guide for the Whiskeytown-Shasta-Trinity National Recreation Area, including the Shasta Unit of the National Recreation Area (NRA), contains management strategies intended to achieve or maintain a desired condition. These strategies take into account opportunities, management recommendations for specific projects, and mitigation measures needed to achieve specific goals. The following strategies

relative to wildlife resource issues associated with the project site were excerpted from the management guide (USFS 1996).

Vegetation (Management Guide, pp. IV-18 through IV-19)

- Prescribed burning, fuel break construction, and other forms of vegetation manipulation will be used to reduce fire hazards and improve forest health.

- Recreation sites will be inventoried and vegetative management plans will be developed to ensure healthy and safe vegetation complexes are maintained over time.

- Bald eagle nest territories will be inventoried and vegetation management plans will be developed to ensure that suitable nest and perch trees are maintained over time.

- Chaparral and woodland habitat management will occur to meet wildlife objectives.

- Interpretive materials will address the need to conserve rare plant communities in accordance with the NRA Interpretive Plan.

- Diversity of native species will be emphasized. Eradication program will be implemented for nonnative, introduced species in areas where healthy, botanically diverse plant communities are necessary to meet ecosystem management objectives.

Wildlife (Management Guide, pp. IV-19 through IV-20)

- Management activities will assure population viability for all native and nonnative desirable species. Management to insure viability will occur within occupied habitat for bald eagle, peregrine falcon, northern spotted owl, northern goshawk, willow flycatcher, western pond turtle, Pacific fisher, Shasta salamander, and candidate species in accordance with species and/or territory management plans, Forest Orders, and appropriate laws and policy.

- Surveys will continue within potential suitable habitats to determine occupancy status for Threatened, Endangered, sensitive, and candidate species.

- Cooperation will continue with the CDFW and USFWS regarding habitat management of wildlife species inhabiting the NRA. Consultation with USFWS will continue regarding habitat management for threatened and endangered species.

Section 404 of the Clean Water Act

The U.S. Army Corps of Engineers regulates discharges of dredged or fill materials into waters of the United States under Section 404 of the Clean Water Act. Waters of the United States include lakes, rivers, streams, and relatively permanent tributaries and adjacent wetlands. Wetlands are defined under Section 404 as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support (and that do support under normal circumstances) a prevalence of vegetation typically adapted for life in saturated soil conditions. Activities that require a permit under Section 404 include, but are not limited to, placing fill or riprap, grading, mechanized land clearing, and dredging. Any activity that results in the deposit of dredged or fill material below the ordinary high-water mark of waters of the United States or within a jurisdictional wetland usually requires a Section 404 permit, even if the area is dry at the time the activity takes place.

Executive Order 11312: Invasive Species

Executive Order 13112 directs Federal agencies to use relevant programs and authorities to do all of the following:

- Prevent the introduction of invasive species
- Detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner
- Monitor invasive species populations accurately and reliably
- Provide for restoration of native species and habitat conditions in ecosystems that have been invaded
- Conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species
- Promote public education on invasive species and the means to address them
- Refrain from authorizing, funding, or carrying out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions

Executive Order 11312 established a national Invasive Species Council made up of Federal agencies and departments and a supporting Invasive Species

Advisory Committee composed of State, local, and private entities. The Invasive Species Council and Advisory Committee oversee and facilitate implementation of the executive order, including preparation of a national invasive species management plan.

Executive Order 11990: Protection of Wetlands

Executive Order 11990 established the protection of wetlands and riparian systems as the official policy of the Federal government. It requires all Federal agencies to consider wetland protection as an important part of their policies and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

Executive Order 13186: Migratory Birds

Executive Order 13186 directs executive departments and agencies to take certain actions to further implement the MBTA. It requires that each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations develop and implement a memorandum of understanding (MOU) with USFWS that will promote the conservation of migratory bird populations.

Executive Order 13443 (Facilitation of Hunting Heritage and Wildlife Conservation)

Executive Order 13443 directs Federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the U.S. Department of the Interior and the U.S. Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

State

California Endangered Species Act

Under the CESA, CDFW has the responsibility for maintaining a list of endangered and threatened species (California Fish and Game Code, Section 2070). CDFW also maintains a list of "candidate species," which are species for which CDFW has issued a formal notice that they are under review for addition to the list of endangered or threatened species. In addition, CDFW maintains lists of "species of special concern," which serve as species "watch lists." Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any State-listed endangered or threatened species may be present in the project study area and, if so, whether the proposed project would have a potentially significant impact on any of these species. In addition, CDFW encourages informal consultation on any proposed project that may affect a species that is a candidate for state listing.

Project-related impacts on species listed as endangered or threatened under the CESA would be considered significant. State-listed species are fully protected

under the mandates of the CESA. "Take" of protected species incidental to otherwise lawful management activities may be authorized under Section 2081 of the California Fish and Game Code. Under the CESA, "take" is defined as an activity that would directly or indirectly kill an individual of a species, but the definition does not include "harm" or "harass," as the Federal act does. As a result, the threshold for take under the CESA is higher than that under the ESA.

Authorization from CDFW would be in the form of an incidental take permit or as a consistency determination (California Fish and Game Code, Section 2080.1(a)). Section 2080.1(a) of the California Fish and Game Code authorizes CDFW to accept a Federal biological opinion as the take authorization for a state-listed species when a species is listed under both the ESA and the CESA.

Sections 3503 and 3513 of the California Fish and Game Code – Protection of Birds of Prey

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided in other sections. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (birds in the order of Falconiformes or Strigiformes (birds of prey) – i.e., eagles, hawks, owls, and falcons), including their nests or eggs. Section 3513 provides for adoption of the MBTA's provisions. It states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird. These State codes offer no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of nongame, migratory birds. Typical violations include destruction of active raptor nests resulting from removal of vegetation in which the nests are located. Violation of Sections 3503.5 and 3513 could also include disturbance of nesting pairs that results in failure of an active raptor nest.

Fully Protected Species under the Fish and Game Code

Protection of fully protected species is described in four sections of the Fish and Game Code (Sections 3511, 4700, 5050, and 5515) that list 37 fully protected species. These statutes prohibit take or possession at any time of fully protected species. CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species. CDFW has informed non-Federal agencies and private parties that they must avoid take of any fully protected species in carrying out projects.

Section 1602 of the California Fish and Game Code – Streambed Alteration

Diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by CDFW, pursuant to Section 1602 of the California Fish and Game Code. The regulatory definition of a stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports wildlife, fish, or other aquatic life. This includes

watercourses that have a surface or subsurface flow that supports or has supported riparian vegetation. CDFW's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. A CDFW streambed alteration agreement must be obtained for a project that would result in an impact on a river, stream, or lake.

Section 401 Water Quality Certification/Porter-Cologne Water Quality Control Act

Under Section 401 of the Clean Water Act, an applicant for a Section 404 permit must obtain a certificate from the appropriate State agency stating that the intended dredging or filling activity is consistent with the State's water quality standards and criteria. In California, the authority to grant water quality certification is delegated by the State Water Resources Control Board to the nine regional water quality control boards (RWQCB). Each of the RWQCBs must prepare and periodically update basin plans for water quality control in accordance with the Porter-Cologne Water Quality Control Act. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Basin plans offer an opportunity to protect wetlands through the establishment of water quality objectives. The RWQCB's jurisdiction includes federally protected waters as well as areas that meet the definition of "waters of the state." A water of the state is defined as any surface water or groundwater, including saline waters, within the boundaries of California. The RWQCB has the discretion to take jurisdiction over areas not federally protected under Section 401, provided that those areas meet the definition of waters of the state. Mitigation requiring no net loss of wetlands functions and values of waters of the State is typically required by the RWQCB.

California Department of Fish and Wildlife Species Designations

CDFW maintains an informal list of species called "species of special concern." These are broadly defined as plant and wildlife species that are of concern to CDFW because of population declines and restricted distributions, and/or because they are associated with habitats that are declining in California. These species are inventoried in the CNDDB regardless of their legal status. Impacts on species of special concern may be considered significant.

Regional and Local

Shasta, Tehama, Glenn, Sutter, Sacramento, and Yolo counties and the cities of Redding, Colusa, and Sacramento have established codes and policies that address protection of natural resources, including vegetation, sensitive species, and trees, and are applicable to the project.

Shasta County's general plan emphasizes that the maintenance and enhancement of quality fish and wildlife habitat is critical to the recreation and tourism industry, and acknowledges that any adverse and prolonged decline of these resources could result in negative impacts on an otherwise vibrant industry. The general plan identifies efforts to protect and restore these habitats

to sustain the long-term viability of the tourism and recreation industry (Shasta County 2004).

The City of Redding's general plan strives to strike a balance between development and conservation by implementing several measures such as creek-corridor protection, sensitive hillside development, habitat protection, and protection of prominent ridge lines that provide a backdrop to the city (City of Redding 2000).

Tehama County's general plan update provides an overarching guide to future development and establishes goals, policies, and implementation measures designed to address potential changes in county land use and development. The general plan identifies the importance of retaining agriculture as one of the primary uses of land in Tehama County (Tehama County 2009).

Glenn County's general plan provides a comprehensive plan for growth and development in Glenn County for the next 20 years (2007–2027). This plan recognizes that public lands purchased for wildlife preservation generate economic activity as scientists and members of the public come to view and study remnant ecosystems (Glenn County 1993).

The City of Colusa's general plan seeks to promote its natural resources through increased awareness and improved public access (City of Colusa 2007).

Sutter County's general plan contains policies that generally address preservation of natural vegetation, including wetlands. It requires that new development mitigate the loss of federally protected wetlands to achieve "no net loss," but it does not include any other specific requirements (Sutter County 2010).

Sacramento County's general plan contains goals and policies that promote management, protection, and restoration of natural habitats and sensitive species of plants and animals throughout the county (Sacramento County 2011). This includes policies for "no net loss" of riparian and oak woodland. The Sacramento County general plan includes specific setbacks from streams that can be 200 feet wide; development within setbacks is prohibited except for passive recreation and stormwater facilities in the outside most 50 feet. It also addresses the need to conserve vernal pools and ephemeral wetlands to ensure no net loss of vernal pool acreage. Several policies specifically promote protection of native oak trees, and, in some areas of the county, seek to ensure that there is no net loss of canopy area.

Chapter 12.56, "Trees Generally," of the City of Sacramento Municipal Code addresses the protection of trees within the city boundaries, including general protection of all trees on city property and specific protection of heritage trees.

Yolo County's general plan aims to provide an active and productive buffer of farmland and open space separating the Bay Area from Sacramento, and integrating green spaces into its communities (Yolo County 2009).

Federal, State, and Local Programs and Projects

California Bay-Delta Authority

The California Bay-Delta Authority was established as a State agency in 2003 to oversee implementation of CALFED for the 25 Federal and State agencies working cooperatively to improve the quality and reliability of California's water supplies while restoring the Bay-Delta ecosystem. The Ecosystem Restoration Program has provided a funding source for projects that include those involving acquisition of lands within the Sacramento River Conservation Area, initial baseline monitoring and preliminary restoration planning, and preparation of long-term habitat restoration management and monitoring plans.

Cantara Trustee Council

The Cantara Trustee Council administers a grant program that has provided funding for numerous environmental restoration projects in the primary study area, including programs in the Fall River watershed, Sulphur Creek, the upper Sacramento River, Middle Creek, lower Clear Creek, Battle Creek, Salt Creek, and Olney Creek. The Cantara Trustee Council is a potential local sponsor for future restoration actions in the primary study area. The Cantara Trustee Council includes representatives from CDFW, USFWS, the Central Valley Regional Water Quality Control Board, the California Sportfishing Protection Alliance, and the Shasta Cascade Wonderland Association.

Resource Conservation Districts

Numerous resource conservation districts (RCD) are within the study area. Once known as soil conservation districts, RCDs were established under California law with a primary purpose to implement local conservation measures. Although RCDs are locally governed agencies with locally appointed, independent boards of directors, they often have close ties to county agencies and the National Resources Conservation Service. RCDs are empowered to conserve resources within their districts by implementing projects on public and private lands and to educate landowners and the public about resource conservation. They are often involved in the formation and coordination of watershed working groups and other conservation alliances. In the Shasta Lake and upper Sacramento River vicinity, districts include the Western Shasta County RCD and the Tehama County RCD. To the east are the Fall River and Pit River RCDs, and to the west and north are the Trinity County and Shasta Valley RCDs.

Riparian Habitat Joint Venture

The Riparian Habitat Joint Venture (RHJV) was initiated in 1994 and includes signatories from 18 Federal, State, and private agencies. The RHJV promotes

conservation and the restoration of riparian habitat to support native bird population through three goals:

- Promote an understanding of the issues affecting riparian habitat through data collection and analysis
- Double riparian habitat in California by funding and promoting on-the-ground conservation projects
- Guide land managers and organizations to prioritize conservation actions

RHJV conservation and action plans are documented in The Riparian Bird Conservation Plan (RHJV 2004). The conservation plan targets 14 "indicator" species of riparian-associated birds and provides recommendations for habitat protection, restoration, management, monitoring, and policy. The report notes habitat loss and degradation as one of the most important factors causing the decline of riparian birds in California. The RHJV has participated in monitoring efforts within the Sacramento National Wildlife Refuge Complex and other conservation areas. The RHJV's conservation plan identifies lower Clear Creek as a prime breeding area for yellow warblers (*Setophaga petechia*) and song sparrows (*Melospiza melodia*), advocating a continuous riparian corridor along lower Clear Creek. Other recommendations of the conservation plan apply to the North Delta Offstream Storage Investigation study area in general.

Sacramento River Advisory Council

In 1986 the California Legislature passed Senate Bill (SB) 1086, which called for a management plan for the Sacramento River and its tributaries to protect, restore, and enhance fisheries and riparian habitat in an area stretching from the confluence of the Sacramento River with the Feather River and continuing northward to Keswick Dam about 4 miles north of Redding. The law established an advisory council that included representatives of Federal and State agencies, county supervisors, and representatives of landowners, water contractors, commercial and sport fisheries, and general wildlife and conservation interests. Responsibilities of the advisory council included development of the *Sacramento River Conservation Area Forum Handbook* (The Resources Agency 2003). This action also resulted in formation in May 2000 of the Sacramento River Conservation Area (SRCA) Forum, a nonprofit, public benefit corporation with a board of directors that includes private landowners and public interest representatives from a seven-county area, an appointee of the California Resources Agency, and ex-officio members from six Federal and State resource agencies.

Sacramento River Conservation Area Program

The SRCA Program has an overall goal of preserving remaining riparian habitat and reestablishing a continuous riparian ecosystem along the Sacramento River between Redding and Chico, and reestablishing riparian vegetation along the

river from Chico to Verona. The program is to be accomplished through an incentive-based, voluntary river management plan. The *Upper Sacramento River Fisheries and Riparian Habitat Management Plan* (The Resources Agency 1989) identifies specific actions to help restore the Sacramento River fishery and riparian habitat between the Feather River and Keswick Dam. The *Sacramento River Conservation Area Forum Handbook* (The Resources Agency 2003) is a guide to implementing the program. The Keswick Dam–to–Red Bluff portion of the conservation area includes areas within the 100-year floodplain, existing riparian bottomlands, and areas of contiguous valley oak woodland, totaling approximately 22,000 acres. The 1989 fisheries restoration plan recommended several actions specific to the study area:

- Fish passage improvements at RBPP (completed)
- Modification of the Spring Creek Tunnel intake for temperature control (completed)
- Spawning gravel replacement program (ongoing)
- Development of side-channel spawning areas, such as those at Turtle Bay in Redding (ongoing)
- Structural modifications to the Anderson-Cottonwood Irrigation District Dam to eliminate short-term flow fluctuations (completed)
- Maintaining instream flows through coordinated operation of water facilities (ongoing)
- Improvements at the Coleman National Fish Hatchery (partially completed)
- Measures to reduce acute toxicity caused by acid mine drainage and heavy metals (ongoing)
- Various fisheries improvements on Clear Creek (partially completed)
- Flow increases, fish screens, and revised gravel removal practices on Battle Creek (beginning summer 2006, ongoing monitoring)
- Control of gravel mining, improvements of spawning areas, improvements of land management practices in the watershed, and protection and restoration of riparian vegetation along Cottonwood Creek (ongoing)

Sacramento River National Wildlife Refuge

The Sacramento River National Wildlife Reserve (SRNWR) is composed of many units between the cities of Red Bluff and Princeton. The SRNWR along

the middle Sacramento River is part of the Sacramento National Wildlife Refuge Complex, consisting of five refuges and three wildlife management areas within the Sacramento Valley. Reaches and subreaches of the river are delineated based generally on transitions in fluvial geomorphic riverine conditions, although county boundaries were considered as well. The middle Sacramento River region between Red Bluff and Colusa includes three units within the Chico Landing Subreach that contain restoration project sites addressed in the Sacramento River–Chico Landing Subreach Habitat Restoration Draft Environmental Impact Report (CBDA 2005). In addition, three areas proposed for restoration in this area occur within the larger SRNWR units that were evaluated in the Environmental Assessment for Proposed Restoration Activities on the Sacramento River National Wildlife Refuge (USFWS 2001; CBDA 2005).

In June 2005, USFWS issued the Sacramento River National Wildlife Refuge Final Comprehensive Conservation Plan and Environmental Assessment and Finding of No Significant Impact (USFWS 2005b) to serve as an integrated management plan for land that it acquires and manages for inclusion in the SRNWR. The SRNWR final comprehensive conservation plan includes goals, objectives, and strategies to guide management of lands within the SRNWR. It also includes assessments of and establishes parameters for "compatible uses," which are uses that are considered compatible with the primary purposes for which the area was established. Riparian habitat restoration projects are being implemented under cooperative agreements between USFWS and other entities such as The Nature Conservancy (TNC) in accordance with the SRNWR final comprehensive conservation plan.

Sacramento River Wildlife Area

The Sacramento River Wildlife Area is managed by CDFW and consists of approximately 3,770 acres of important riparian habitat located along a 70-mile reach of the lower Sacramento River. These lands are managed to protect and enhance habitat for wildlife species, and to provide the public with compatible, wildlife-related recreational uses. This management is guided by the Sacramento River Comprehensive Management Plan (CDFG 2004).

Sacramento River Preservation Trust

The Sacramento River Preservation Trust is a private, nonprofit organization active in environmental education and advocacy to preserve the natural environmental values of the Sacramento River. The trust has participated in various conservation and land acquisition projects, including securing lands for the SRNWR. The group is pursuing designation of a portion of the Sacramento River between Redding and Red Bluff as a national conservation area.

Sacramento River Watershed Program

The Sacramento River Watershed Program is an effort to bring stakeholders together to share information and work together to address water quality and other water-related issues within the Sacramento River watershed. The group is

funded congressionally through the U.S. Environmental Protection Agency. The program's primary goal is "to ensure that current and potential uses of Sacramento River watershed resources are sustained, restored, and where possible, enhanced while promoting the long-term social and economic vitality of the region." The Sacramento River Watershed Program manages grants for the Sacramento River Toxic Pollutants Control Program; performs extensive water quality monitoring and data collection and management for the watershed; and is instrumental in the study and monitoring of toxic pollutants. Although the program does not implement restoration projects, it is a potential partner for coordinating research and monitoring through consensus-based collaborative partnerships and promoting mutual education among the stakeholders of the Sacramento River watershed.

Sacramento Watersheds Action Group

The Sacramento Watersheds Action Group (SWAG) is a nonprofit corporation that secures funding for, designs, and implements projects that provide watershed restoration, streambank and slope stabilization, erosion control, watershed analysis, and road removal. SWAG has successfully worked with local groups, agencies, and organizations to fund and complete restoration projects on the Sacramento River and tributaries downstream from Keswick Dam. Their projects include development of the Sulphur Creek Watershed Analysis and Action Plan, the Whiskeytown Reservoir Shoreline Erosion Control Project, the Sulphur Creek Crossing Restoration Project, and the Lower Sulphur Creek Realignment and Riparian Habitat Enhancement Project. SWAG is a potential local sponsor for watershed restoration actions in the study area.

Shasta Land Trust

The Shasta Land Trust is a regional, nonprofit organization dedicated to conserving open space, wildlife habitat, and agricultural land. This organization works with public agencies and private landowners and is funded primarily through membership dues and donations. It employs various voluntary programs to protect and conserve valuable lands using conservation easements, land donations, and property acquisitions. The trust is a potential local partner for restoration activities in the Shasta Dam–to–Red Bluff area.

The Nature Conservancy

TNC is a private, nonprofit organization involved in environmental restoration and conservation throughout the United States and the world. TNC approaches environmental restoration primarily through strategic land acquisition from willing sellers and obtaining conservation easements. Some of the lands are retained by TNC for active restoration, research, or monitoring activities, while others are turned over to government agencies such as USFWS or CDFW for long-term management. Lower in the Sacramento River basin, TNC has been instrumental in acquiring and restoring lands in the SRNWR and managing several properties along the Sacramento River. It also has pursued conservation easements on various properties at tributary confluences, including Cottonwood and Battle Creeks.

The Trust for Public Land

The Trust for Public Land is a national, nonprofit organization involved in preserving lands with natural, historic, cultural, or recreational value, primarily through conservation real estate. This organization's Western Rivers Program has been involved in conservation efforts along the Sacramento River between Redding and Red Bluff (BLM's Sacramento River Bend Management Area), Battle Creek, Paynes Creek, Inks Creek, and Fenwood Ranch in Shasta County. The group promotes public ownership of conservation lands to ensure public access and enjoyment.

Chapter 2
Wildlife Resources Attachments

This technical report includes the following attachments:

- 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 Survey Results – 2007”
- Attachment 4, “Species Accounts for Special-Status Wildlife in the Primary Study Area Downstream from Shasta Dam”
- Attachment 5, “State and 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 CNDDB”

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Chapter 3
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