

College Boulevard, as shown in **Table 3-13**. The Auburn Ravine below the Auburn Ravine Tunnel Outlet had a B-IBI score of 41, which is considered to be “fair,” as shown in **Figure 3-103**.

**TABLE 3-13  
BENTHIC INDEX OF BIOTIC INTEGRITY FOR SITES AT AUBURN RAVINE, SECRET RAVINE, AND MINERS RAVINE**

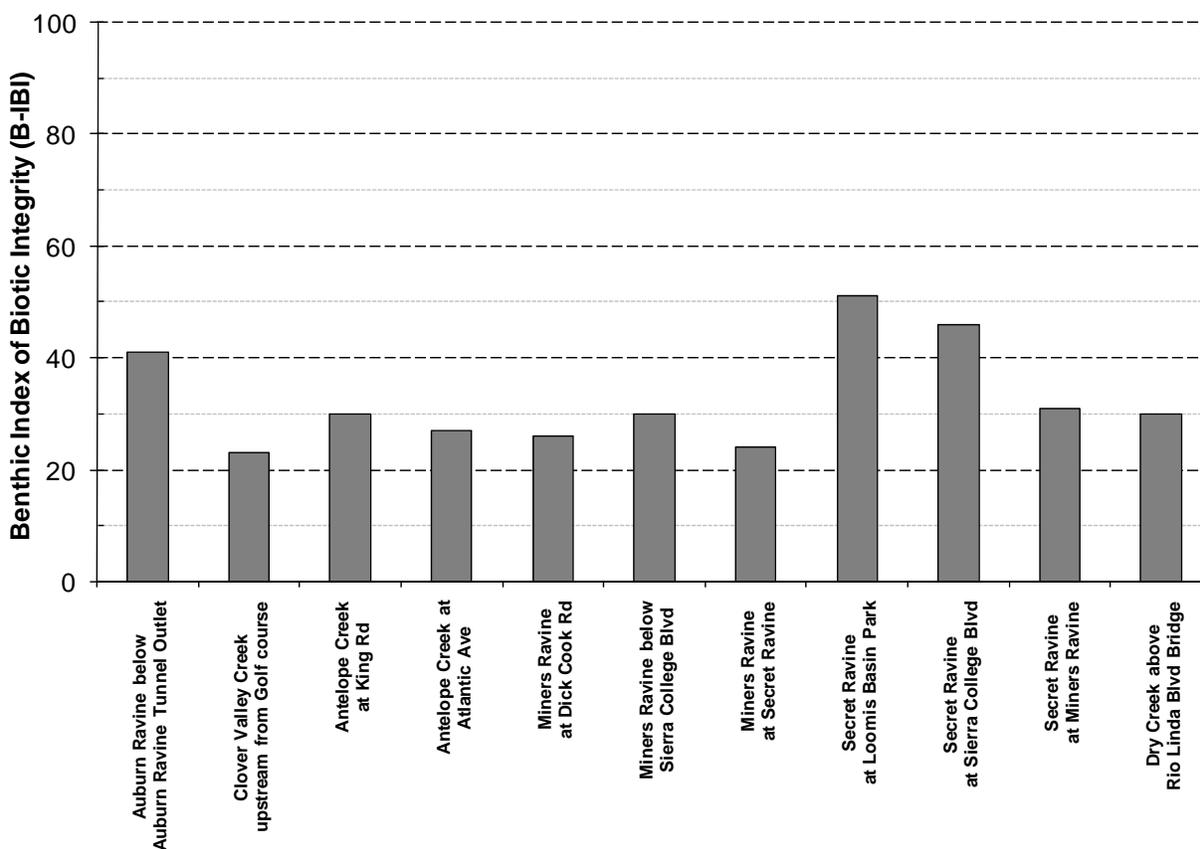
	Auburn Ravine below Auburn Ravine Tunnel Outlet	Secret Ravine at Loomis Basin Park	Miners Ravine below Sierra College Blvd
Coleoptera taxa	4	4	0
EPT taxa	5	6	5
Predator Taxa	2	5	4
Collectors (%)	5	5	4
Intolerant (%)	1	2	1
Non-Insect (%)	4	7	2
Tolerant (%)	8	7	5
Total	29	36	21
B-IBI Score	41	51	30
Ranking	Fair	Fair	Poor

**TABLE 3-14  
PHYSICAL HABITAT SCORES FOR BENTHIC MACROINVERTEBRATE ANALYSES AT AUBURN RAVINE, SECRET RAVINE, AND MINERS RAVINE**

	Auburn Ravine below Auburn Ravine Tunnel Outlet	Secret Ravine at Loomis Basin Park	Miners Ravine below Sierra College Blvd
Flow (cfs)	9.6	3.0	1.7
Temperature (°F)	57.4	55.8	55.2
Habitat Types, % Riffle	41	15	11
Slope (average %)	2.5	0.5	1.4
Instream Habitat <sup>1</sup>	14	11	5
Sediment Deposition <sup>1</sup>	19	11	5
Channel Alteration <sup>1</sup>	15	11	18

Note:

<sup>1</sup>Score is out of possible 20.



**FIGURE 3-103  
COMPARISON OF BENTHIC INDEX OF BIOTIC INTEGRITY SCORES AT STREAM  
SITES IN THE PCWA SERVICE AREA**

As for physical habitat, there is a high percentage of riffle habitat, and the cobble and gravel substrate within the segment sampled had very little sediment, as shown in **Table 3-14**. Detailed results of physical habitat analyses at Auburn Ravine below Auburn Ravine Tunnel Outlet are provided in **Appendix A**.

#### **Clover Valley Creek Watershed**

Studies of aquatic habitat and species conditions in Clover Valley Creek are very limited. Clover Valley Creek is not included in the designated Critical Habitat for Central Valley steelhead (Placer County 2006). An impassable culvert blocks access of salmonids to Clover Valley Creek (Placer and Sacramento Counties 2003). The lack of deep pools and clean riffle habitat limits the potential for biodiversity, which tends to limit food and preferred habitat for rearing salmonids. The potential for salmonid rearing is considered to exist in lower portions of the creek.

In general, substrate and habitat conditions in Clover Valley Creek are considered unsuitable for rearing salmonids (Placer County 2006). Common substrate in the creek consists of fine sediments (sand and silt) with very little gravel and cobbles, particularly in downstream areas. High sediment loads and sediment deposition, degraded water quality, invasive species, and lack

of riparian vegetation contribute to degraded aquatic habitat conditions in Clover Valley Creek. Lower Clover Valley Creek is highly channelized and sometimes impounded.

Although suitable habitat conditions for some salmonid life stages may exist in Clover Valley Creek, there are many significant barriers to upstream passage of anadromous salmonids (City of Rocklin 2006), including an impassable culvert just upstream of its confluence with Antelope Creek (Placer and Sacramento Counties 2003). The Argonaut Bridge crossing, an impoundment structure at Cimarron Court, and an instream impoundment downstream of Midas Way and Rawhide Drive Bridge are all barriers along Clover Valley Creek (City of Rocklin 2006). The total flow of the creek passes through a 30-foot-long culvert, approximately 2 feet in height, and about 3 feet wide. On the downstream side, the culvert hangs 2 feet over the streambed. Migrating salmonids reportedly cannot swim through the flow from the culvert because of its relatively small opening and high flow velocity (Placer and Sacramento Counties 2003).

Because Clover Valley Creek is a tributary to Antelope Creek, fish species present in Clover Valley Creek are likely comparable to the fish species present in Antelope Creek, described below. An Aquatic Habitat Survey and Fisheries Assessment was conducted by ECORP Consulting, Inc. on Clover Valley Creek on June 16 and 19, 2006 (ECORP 2006). The fish community in Clover Valley Creek was found to be dominated by native minnow and hitch (*Lavinia exilicauda*), particularly in the upper portion of the creek. The nonnative western mosquitofish (*Gambusia affinis*) and green sunfish (*Lepomis cyanellus*) were observed in the lower portions of the creek. No salmonids were observed during the survey. The native Sacramento sucker was also found along Clover Valley Creek. Hitch and Sacramento sucker both prefer low-gradient streams with slow water velocities and sandy to gravel substrates, as do green sunfish and mosquitofish. All four species are tolerant of the warm water temperatures characteristic of Clover Valley Creek, particularly during summer and fall.

Based on BMI analyses conducted by DCC (**Figure 3-103**), the site at Clover Valley Creek upstream from the Sunset Whitney Country Club on Midas Avenue in Rocklin had a B-IBI score of 23, which is considered to be “poor,” likely due to presence of organisms tolerant to water quality pollutants and a general lack of benthic macroinvertebrate species diversity.

### **Antelope Creek Watershed**

Antelope Creek is not as well studied as other headwater tributaries of Dry Creek (Secret Ravine and Miners Ravine). Although fall-run Chinook have been periodically documented over the past 40 years to use parts of the watershed for spawning, there is no reliable data on whether steelhead are currently present in the watershed. Similar to Clover Valley Creek, Antelope Creek is not designated as critical habitat for Central Valley steelhead.

Aquatic habitat in Antelope Creek is characterized as low in diversity, generally consisting of flatwater (i.e., shallow run and shallow glide) habitat (Placer and Sacramento Counties 2003). Use of Antelope Creek by anadromous salmonids is generally considered to be limited to occasional stray adults during years of at least moderate streamflow during the migration period. Two potential spawning areas have been identified in Antelope Creek, but the associated habitat is generally not favorable to salmonids (Placer and Sacramento Counties 2003). Juvenile

salmonid habitat is generally limited to shallow pool habitat during years of at least moderate streamflow. Low streamflows in Antelope Creek could impede adult anadromous fish passage during critical periods of the year (Sierra Business Council 2003).

Antelope creek is located in a primarily urban and suburban area. Past and ongoing construction activities adjacent to the creek have resulted in significant upland disturbance and sediment contribution to the stream. Accumulated sediment is common in the lower portion of Antelope Creek. Several portions of the creek are incised (City of Roseville 2005), and vulnerable to erosion. Accumulated sediments, such as sand, small cobbles, and exposed granite, are common in the lower portion of Antelope Creek (Placer and Sacramento Counties 2003). A spawning gravel study conducted by Jones & Stokes in 2004 found that 77 percent of substrate in Antelope Creek was fine sediment, in which fish eggs and larvae would unlikely survive (Placer County Planning Department 2005b).

With the exceptions of wide variations in pH, high nutrient levels, and observed copper concentrations in Antelope Creek, most of the watershed's water quality conditions are capable of supporting anadromous fish year-round (Placer and Sacramento Counties 2003). Water temperatures measured in the creek show that approximately 25 to 50 percent of the channel length is suitable for summer rearing for steelhead (**Table 3-15**). However, some sites along the creek have water temperatures too high for salmonid egg incubations and juvenile rearing (Placer and Sacramento Counties 2003).

**TABLE 3-15**  
**WATER TEMPERATURE CRITERIA FOR CHINOOK SALMON AND STEELHEAD**

Life Stage	Chinook Salmon	Steelhead
Adult Migration	Less than 57°F	Less than 52°F
Spawning	Less than 57°F	Less than 54°F
Incubation	Less than 55°F	Less than 54°F
Juvenile Rearing	Less than 61°F	Less than 65°F

*Sources: A. A. Rich and Associates 2007; Bell 1990; DFG 2007 a and 2007b; Marine 1992; McCullough et al. 2001; NMFS 2002 and 2003; Reiser and Bjornn 1979;*

Riparian development has also affected instream habitat, and is generally characterized as poor to fair for aquatic resources (Placer and Sacramento Counties 2003). Large riparian trees are sparse and the floodplain is constrained by the Union Pacific railroad tracks, Interstate 80 to the east, and an old landfill to the west (City of Roseville 2005). The riparian corridor of Antelope Creek consists largely of overhanging vegetation, such as Himalayan blackberry, and remnant oak woodland. Nonnative and native grassland uplands are present, as are wetland swales.

Rock dams, beaver dams, diversion dams, and culverts provide barriers to fish passage (Placer and Sacramento Counties 2003). Asphalt-bottomed culverts underneath Sunset Boulevard and a dam at a large wetlands complex upstream of the railroad bridge in Rocklin are particular fish passage concerns (Placer and Sacramento Counties 2003).

Fish species present in Antelope Creek are provided in **Table 3-16**.

**TABLE 3-16  
FISH SPECIES PRESENT IN ANTELOPE CREEK**

Native		Introduced	
Common Name	Scientific Name	Common Name	Scientific Name
Fall-run Chinook salmon	Oncorhynchus tshawytscha	Black bullhead	Ameiurus melas
Hitch	Oncorhynchus mykiss	Brown bullhead	Ameiurus nebulosus
Sacramento sucker	Lavinia exilicauda	Common carp	Cyprinus carpio
Sacramento pikeminnow	Catostomus occidentalis	Mosquitofish	Gambusia affinis
Speckled dace	Ptychocheilus grandis	Green sunfish	Lepomis cyanellus
	Rhinichthys osculus	Golden shiner	Notemigonus crysoleucas
			Micropterus spp.

Source: Sierra Business Council, 2003

Note: A general siting of both Trout and Bass was reported during the 1959 DFG survey, but specific species were not identified (DFG, 1959)

The BMI community observed at Antelope Creek during previous studies was primarily composed of organisms that are moderately to highly tolerant of impaired water quality conditions. BMI analyses were conducted at two sites (King Road and Atlantic Avenue) along the Antelope Creek by the DCC in 2000. As shown in **Figure 3-103**, the I-IBI score for the upstream site at King Road was 30, and the score for the downstream site at Atlantic Avenue was 27, both of which are considered to be “poor.” The limited aquatic insect populations found resulted in the “poor” rating at both sites. The data also indicate a high percentage of pollutant-tolerant organisms, with few BMI taxa associated with cleaner waters (Placer and Sacramento Counties 2003). The combination of high seasonal flow fluctuations, water quality conditions, and high sediment loads in the creek may have contributed to the observed results (Placer and Sacramento Counties 2003).

### **Secret Ravine Watershed**

Secret Ravine is a major tributary of Dry Creek, and is designated as Critical Habitat for Central Valley steelhead (70 CFR 52488, September 2, 2005). Secret Ravine is said to be the most productive stream within the Dry Creek watershed for Central Valley fall-run Chinook salmon and Central Valley steelhead, despite urban encroachment and other human-influenced impacts (Fields 1999). Surveys conducted for steelhead in the Dry Creek watershed have shown that most of the suitable spawning and rearing habitat occurs in Secret Ravine (Placer County Planning Department 2005b).

Both fall-run Chinook salmon and steelhead have been documented spawning in Secret Ravine (Placer County Planning Department 2005b). Based on a 2005 survey, estimated spawning habitat area for spawning in Secret Ravine totaled 1,175 square feet, with the capacity for 21 potential redds (nests) for steelhead and 12 potential redds for Chinook salmon (Placer County Planning Department 2005b). Since the late 1990s, an average of 160 adult fish per year have been observed in Secret Ravine (Placer and Sacramento Counties 2003). Juvenile steelhead have

been observed rearing in Secret Ravine near the headwaters around Gilardi Road and downstream to the Brace Road crossing (Sierra Business Council 2003).

Water temperatures in Secret Ravine have been documented as warmer than ideal and suitable ranges for steelhead rearing (**Table 3-15**), which would have a particular effect on juvenile steelhead (Placer County Planning Department 2005b). Water temperatures measured at Gilardi Road during October 2003 to March 2004 (incubation period) were generally lower than criteria identified in **Table 3-15** for sensitive life stages (Sierra Business Council 2003b). Rearing habitat is limited around Sierra College because of high water temperatures and limited thermal refugia are present in the summer. Chinook salmon, however, typically leave within a few months of hatching.

The 2004 spawning gravel study found the amount of fines measured to range from 51 to 82 percent for Secret Ravine (Placer County Planning Department 2005). Adult Chinook salmon and steelhead clean fine sediments from the gravel with their caudal fins during spawning, and as long as fine sediment does not overwhelm the redd, egg and larvae survival is possible.

Well-established beaver dams, from 0.6 to 1.2 meters (2 to 4 feet), were observed during salmonid spawning gravel surveys in Secret Ravine (Placer County Planning Department 2005b). If these observed dams remain intact during the salmonid migration period, then they could represent significant passage impediments or complete passage barriers. Steelhead, however, tend to migrate in winter months when flows are higher, and obstacles are less of a factor to passage. There is also at least one permanent barrier created by a pipeline, and several utility pipe crossings that may be additional obstacles to fish migration (Placer and Sacramento Counties 2003).

Additional fish species that can be found in Secret Ravine (mostly the lower reaches) are listed in **Table 3-17**. The impact of introduced fishes on fall-run Chinook salmon and steelhead in Secret Ravine is not known. However, bass and sunfish (especially spotted bass) are highly predatory species and could be expected to opportunistically feed on rearing and emigrating juvenile Chinook salmon and steelhead. The degree to which this occurs in Secret Ravine, however, is unknown.

**TABLE 3-17  
FISH SPECIES PRESENT IN SECRET RAVINE AND MINERS RAVINE**

Native		Introduced	
Common Name	Scientific Name	Common Name	Scientific Name
Sacramento sucker	Catostomus occidentalis	White catfish	Ameiurus catus
Roach	Hesperoleucus symmetricus	Black bullhead	Ameiurus melas
Pacific lamprey	Lampetra tridentate	Brown bullhead	Ameiurus nebulosus
Hitch	Lavinia exilicauda	Common carp	Cyprinus carpio
Hardhead	Mylopharodon conocephalus	Mosquitofish	Gambusia affinis
Steelhead	Oncorhynchus mykiss	Green sunfish	Lepomis cyanellus
Fall-run Chinook salmon	Oncorhynchus tshawytscha	Warmouth	Lepomis gulosus
Sacramento pikeminnow	Ptychocheilus grandis	Bluegill	Lepomis macrochirus
		Redear sunfish	Lepomis microlophus
		Smallmouth bass	Micropterus dolomieu
		Spotted bass	Micropterus punctulatus
		Largemouth bass	Micropterus salmoides
		Fathead minnow	Pimephales promelas
		White crappie	Pomoxis annularis

Source: DFG 2003.

Fish communities and associated aquatic habitat were assessed in the Secret Ravine by DFG in fall 2004 and spring 2005. Although not as high as Auburn Ravine, both fish IBI scores for Secret Ravine were fairly high, with scores of approximately 75 out of 100 (Titus et al. 2005). The gross ecological health of Secret Ravine was rated “good to very good” by Titus et al. (2005) based on its IBI score.

BMI surveys have been performed in Secret Ravine, including studies by de Barruel et al. (2003), Fields (1999), and DCC (data collected in 1997, 1998, and 2000 through 2006). Although BMI populations reflecting pollution and high water temperatures within Secret Ravine were found in all three studies, overall results suggest that Secret Ravine provides the highest quality fisheries habitat in the Dry Creek watershed (Placer and Sacramento Counties 2003).

Data studies with upstream and downstream sites found more pollutant-tolerant organisms near the confluence with Miners Ravine than at upstream locations. As shown in **Table 3-13** and **Figure 3-103**, the 2007 DCC BMI study found the site at Secret Ravine at Loomis Basin Park to have a B-IBI score of 51, which is considered “fair” (Titus et al. 2005). This score was higher than any previous score recorded for BMI sites in the Dry Creek watershed. During this BMI assessment, physical habitat at Secret Ravine at Loomis Basin Park exhibited low slopes and low flow velocities, and a fairly low percentage of riffle habitat compared to Auburn Ravine (**Table 3-14**). However instream habitat was fairly high for these conditions, and was measured at 11 out of 20. Sediment deposition and channel alteration results were lower at this site than at Auburn Ravine. Detailed results of BMI population, B-IBI, and physical habitat analyses for Secret Ravine at Loomis Basin Park are provided in **Appendix A**.

DCC also conducted BMI sampling in 2000 and 2001 at two downstream locations along the creek: Secret Ravine at Sierra College Boulevard and Secret Ravine at its confluence with Miners Ravine. The Sierra College Boulevard site received a B-IBI score of 46, which is considered “fair,” and the Secret Ravine at Miners Ravine received a rating of 31, which is considered “poor.” Results from these studies indicated a high percentage of pollutant-tolerant organisms with almost no taxa associated with cleaner waters. A BMI survey was conducted at Secret Ravine just downstream from Sierra College (upstream site) and at Secret Ravine just upstream from its confluence with Miners Ravine (downstream site) (de Barruel and West 2003). In this study, the percentage of pollutant-tolerant BMI organisms at the downstream site were found to be significantly higher than at the upstream site, indicating higher perturbation and pollution at the downstream site (de Barruel and West 2003).

### **Miners Ravine Watershed**

Like Secret Ravine, Miners Ravine is a major tributary of Dry Creek, and is also designated as Critical Habitat for Central Valley steelhead (70 CFR 52488, September 2, 2005). Both fall-run Chinook salmon and steelhead have been observed spawning in Miners Ravine (DWR 2002). In the 1950s, up to 100 adult Chinook salmon were estimated to occur in Miners Ravine; however, there is little current information regarding the spawner abundance of Chinook salmon in Miners Ravine, though the Dry Creek Conservancy conducts spawning surveys on up to several days per season (Bates pers. com). During some years in the 1980s and 1990s, DFG planted as many as 100,000 juvenile Chinook salmon from the Feather River hatchery in the lower reaches of Miners Ravine. Although mostly inaccessible to salmonids, aquatic habitat along Miners Ravine was observed to be of highest quality upstream of Cottonwood Dam, near Dick Cook Road, where there is a high canopy cover, deep pools, and higher concentrations of spawning gravel (DWR 2002).

Summer water temperatures in Miners Ravine have been documented as higher than the suitable ranges for steelhead rearing (**Table 3-15**). However, deep pools and cool groundwater accretion could provide thermal refugia for juvenile steelhead. Water temperature data was not recorded during the periods when Chinook salmon would be present in Miners Ravine.

Livestock grazing and riparian vegetation removal have caused increased erosion along banks. Substrate found in Miners Ravine was dominated by fines, such as silt, and clay (DWR 2002), with fine sediment measured between 50 and 75 percent. With the ability of adult Chinook salmon and steelhead to clean fine sediments from the gravel during spawning, egg and larvae survival is still possible if the fines are not reintroduced into the redd.

Many barriers in Miners Ravine reduce the quality of migration habitat. These barriers include six road crossings, one culvert, eight dams, and three natural barriers. Cottonwood Dam, built in the 1950s, is considered to be the uppermost limit to anadromous species in Miners Ravine, but steelhead may be able to pass during flood flows (Placer County Planning Department 2005a, Placer and Sacramento Counties 2003). Additionally, 80 beaver dams were observed in Miners Ravine in one survey (DWR 2002).

Miners Ravine is dominated by spotted bass, a predatory species. As described for Secret Ravine, introduced fishes, such as bass and sunfish, may opportunistically feed upon juvenile salmon and steelhead. Additional fish species that can be found in Miners Ravine (mostly in the lower reaches) are listed in **Table 3-17**.

Fish communities and associated aquatic habitat were assessed in the Miners Ravine by DFG in fall 2004 and spring 2005. Both IBI scores for Miners Ravine were relatively low compared to those of Auburn Ravine and Secret Ravine, with scores of approximately 53 out of 100 (Titus et al. 2005). The gross ecological health of Miners Ravine was rated “fair” based on its IBI score. This low score is due, in part, to the dominant presence of golden shiners (considered an environmentally tolerant species) in the upper reaches of Miners Ravine.

DCC conducted BMI investigations in Miners Ravine from 2000 to 2006 at sites upstream and downstream from the Placer County SMD No. 3 WWTP (DCC 2006). Results of these studies indicate more diversity and more sensitive macroinvertebrates in upstream reaches, and a high proportion of pollution-tolerant organisms farther downstream. Overall, the B-IBI scores at Miners Ravine were considered to be “poor,” with a score of about 26 at Miners Ravine at Dick Cook Road, 30 at Miners Ravine downstream from Sierra College Boulevard, and 24 at Miners Ravine at its confluence with Secret Ravine (**Figure 3-103**). The lack of aquatic habitat complexity and high sediment loads in the ravine also contribute to low B-IBI scores. The Miners Ravine site downstream of Sierra College Boulevard was assessed by DCC in 2007, during which physical habitat exhibited fairly low slopes and very low-flow velocities, as well as the lowest percentage of riffle habitat compared to Auburn Ravine and Secret Ravine (**Table 3-14**). Instream habitat was also the lowest of the three sites, and was measured at 5 out of 20, and channel alteration results exhibited the highest value, at 18 out of 20 (**Table 3-14**). Detailed results of BMI population, B-IBI, and physical habitat analyses for Miners Ravine below Sierra College Boulevard are provided in **Appendix A**.

### **3.3.2.3 Zone 5**

As described earlier, portions of Auburn Ravine are designated as Critical Habitat for Central Valley steelhead (70 CFR 52488, September 2, 2005). Auburn Ravine, downstream from Highway 65, conveys water from the PCWA raw water distribution system to Zone 5 customers. The Zone 5 portion receives treated effluent from the City of Lincoln’s WWTP. Rice farms contribute return flows in this area as well.

Spawning gravels in the Auburn Ravine contain high levels of sediment. High erosion within this portion of the ravine is likely due to grazing, other land-use practices, and channel instability. The reaches of Auburn Ravine within Zone 5 have predominantly sandy and fine sediment, which makes egg and larvae survival difficult. As a result, there is minimal spawning habitat available to salmonids in Zone 5.

Riparian habitat varies along the Zone 5 portion of Auburn Ravine. Within Zone 5, Auburn Ravine is characterized as having primarily low levels of shade (Placer County Planning Department 2005b).

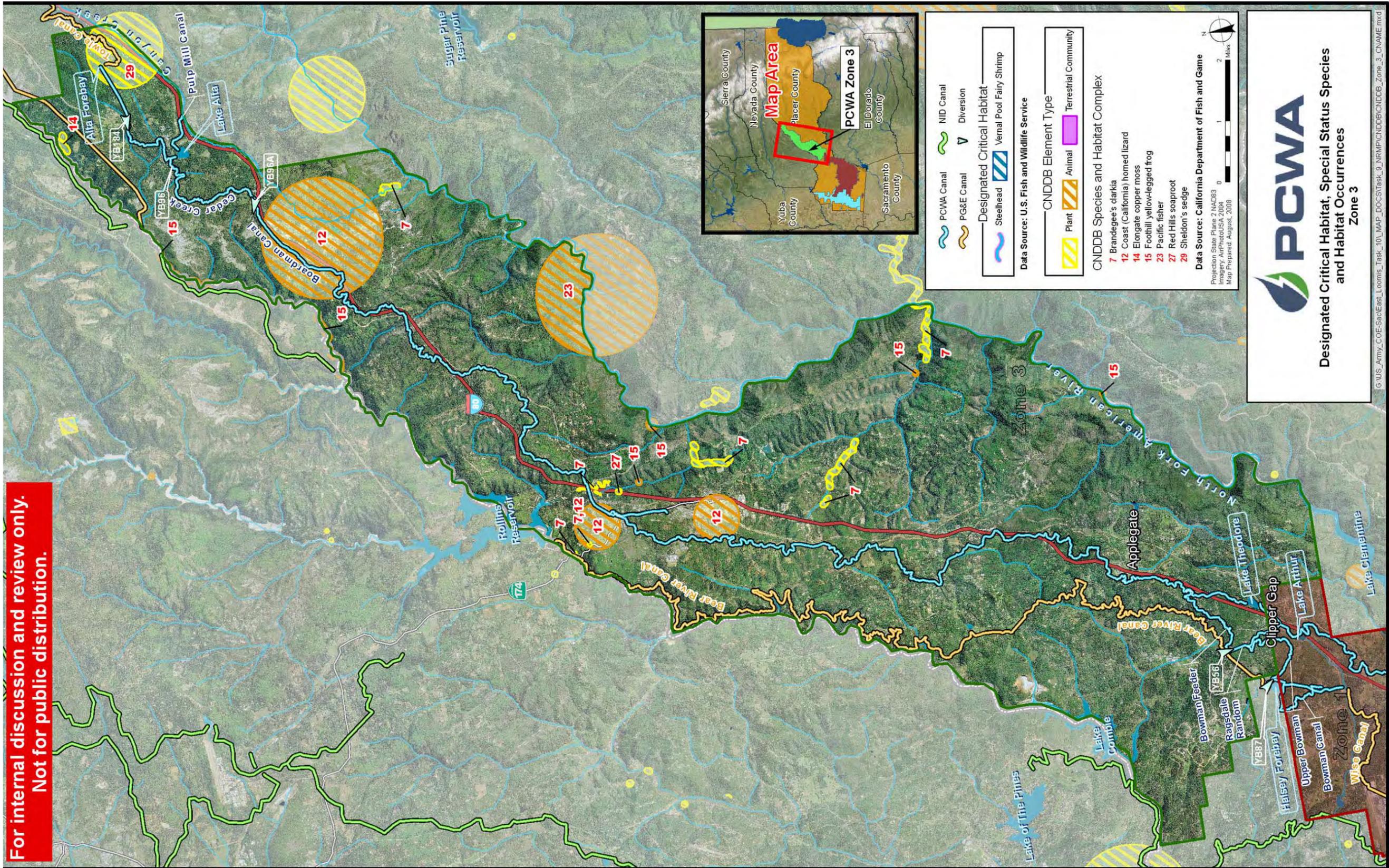
Barriers to salmonid migration exist along the Zone 5 portion of Auburn Ravine. Auburn Ravine is seasonally dammed by South Sutter Irrigation District on behalf of PCWA at two locations: Moore Dam and Pleasant Grove Dam. Auburn Ravine flows at Moore Dam are diverted to Moore Canal. Further downstream, flows are diverted from Auburn Ravine at the Pleasant Grove Dam to the Pleasant Grove Canal.

### 3.3.3 Special Status Species

Threatened and Endangered Species Critical Habitat designations in the study area, as well as CNDDDB records of occurrence, are shown in **Figures 3-104 to 3-107** (USFWS 2008, CNDDDB 2008). **Table 3-18** summarizes known special status species occurrences within Zones 3, 1, and 5 (CNDDDB 2008). PCWA canals, reservoirs, and conveyances in the study area cross a number of habitat types. Although these water bodies may traverse habitats that are used by special status species, O&M activities may not directly affect these habitats and/or species might not be present throughout the study area. Surveys should be conducted before O&M activities to determine which habitat types would be affected and whether special status species are present.

In addition to known species occurrences, a number of special status species have been identified as having the potential to occur. These are summarized in **Table 3-19**, along with their habitat preferences.

Special status species known to occur in the area that could be affected indirectly by impacts to hydrology, water quality, and/or sedimentation in Auburn Ravine, Clover Valley Creek, Antelope Creek, Secret Ravine, Miners Ravine, or connected downstream areas include Central Valley steelhead, fall-run Chinook salmon, western pond turtle, and foothill yellow-legged frog.



**FIGURE 3-104**  
**ZONE 3 DESIGNATED CRITICAL HABITAT, CALIFORNIA NATURAL DIVERSITY DATABASE SPECIAL STATUS SPECIES OCCURRENCES, AND HABITAT COMPLEXES**

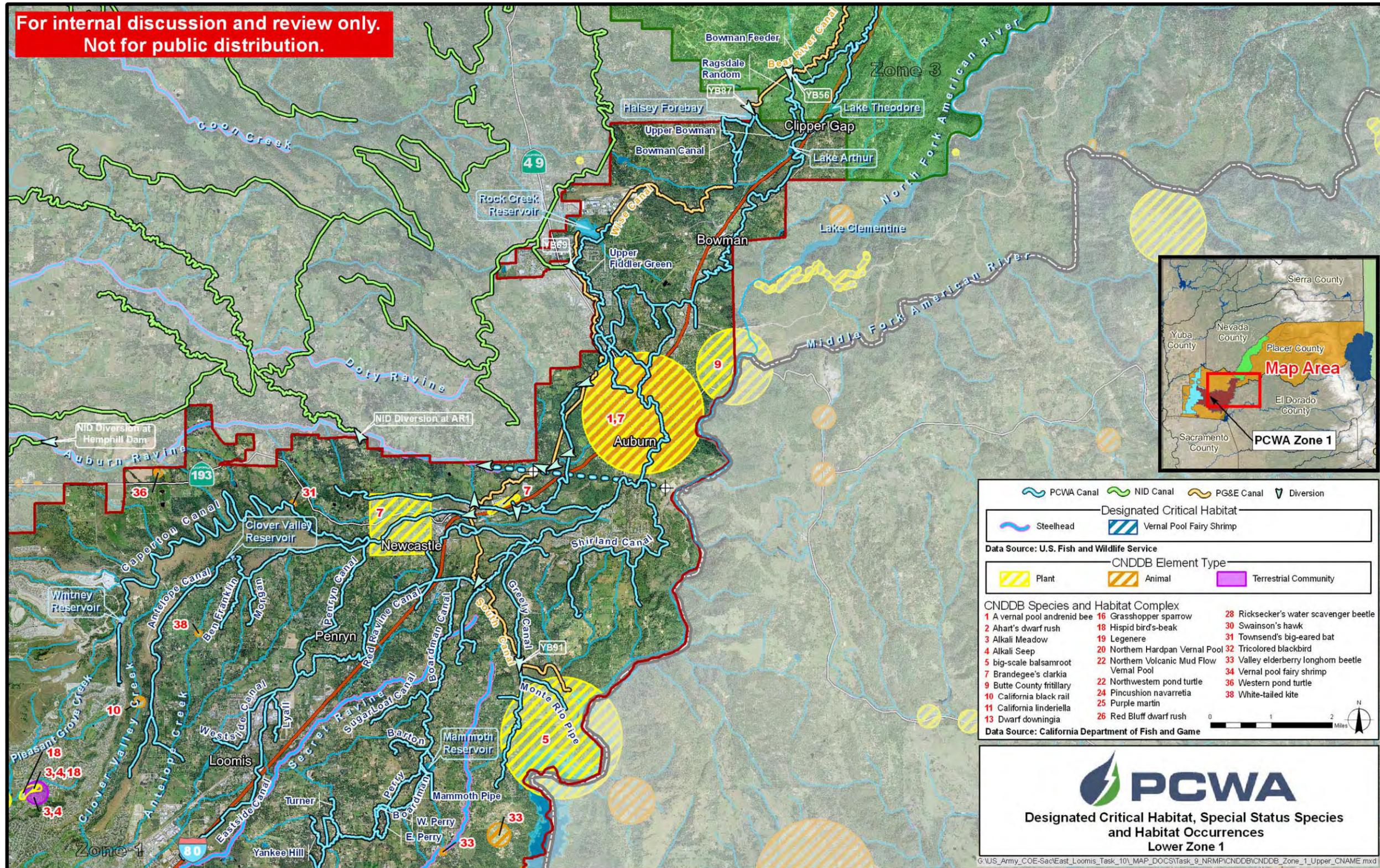


FIGURE 3-105

UPPER ZONE 1 DESIGNATED CRITICAL HABITAT, CALIFORNIA NATURAL DIVERSITY DATABASE SPECIAL STATUS SPECIES OCCURRENCES, AND HABITAT COMPLEXES

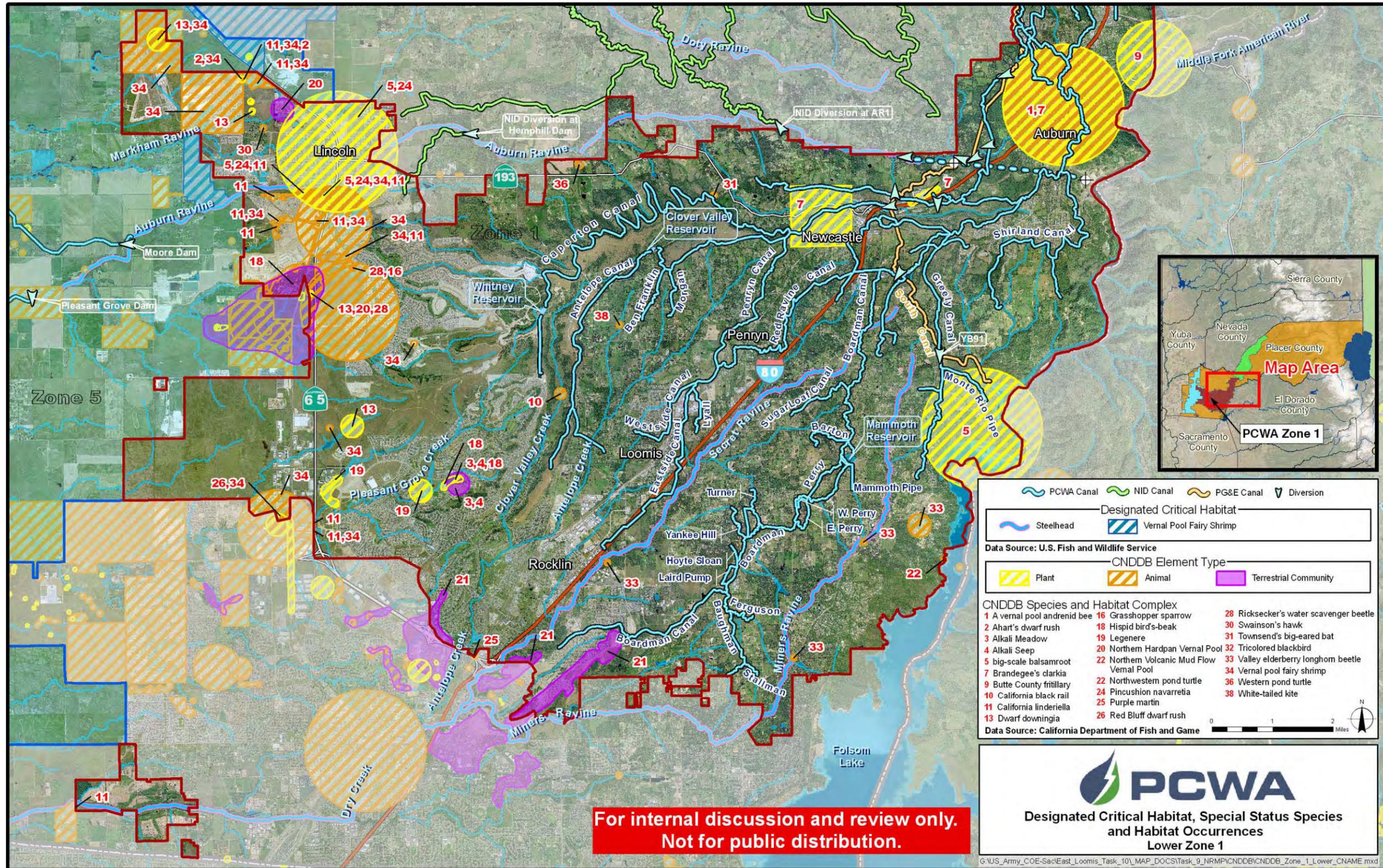


FIGURE 3-106

LOWER ZONE 1 DESIGNATED CRITICAL HABITAT, CALIFORNIA NATURAL DIVERSITY DATABASE SPECIAL STATUS SPECIES OCCURRENCES, AND HABITAT COMPLEXES

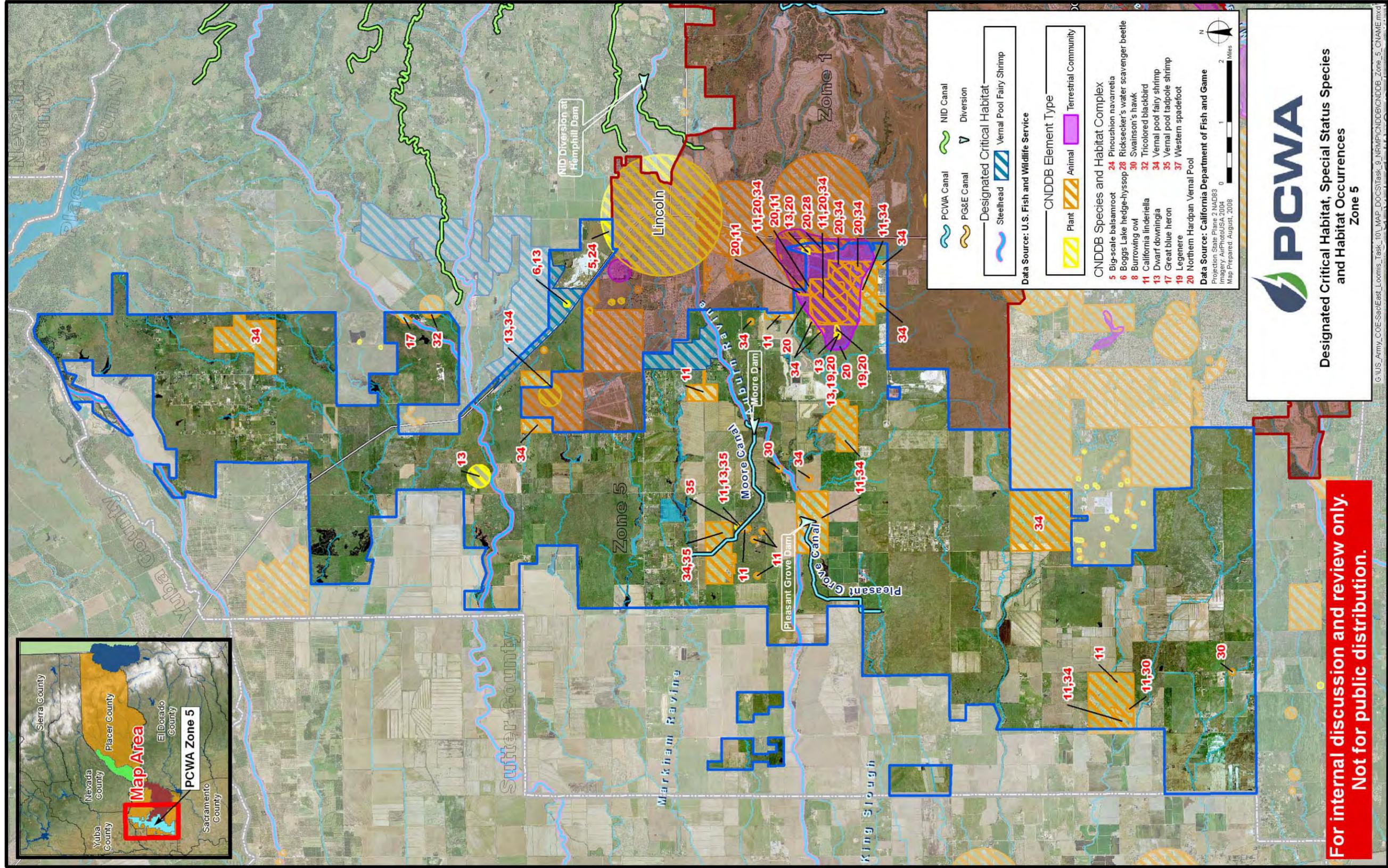


FIGURE 3-107  
 ZONE 5 DESIGNATED CRITICAL HABITAT, CALIFORNIA NATURAL DIVERSITY DATABASE SPECIAL STATUS SPECIES OCCURRENCES, AND HABITAT COMPLEXES

**TABLE 3-18  
KNOWN SPECIAL STATUS SPECIES OCCURRENCES IN ZONES 1, 3, AND 5 (CNDDDB 2008)**

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Occurrence	Notes
<b>Wildlife</b>							
Hardhead	<i>Mylopharodon conocephalus</i>	--	WL		Undisturbed areas of larger middle-and low-elevation streams	Zones 1 and 5	
Central Valley steelhead	<i>Oncorhynchus mykiss</i>	T	T		Riverine (not known to occur in canals)	Zones 1 and 5	
Fall-run Chinook salmon	<i>Oncorhynchus tshawytscha</i>	SC	SSC		Riverine (not known to occur in canals)	Zones 1 and 5	
vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	T	--		vernal pools	Zones 1 and 5	
vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	E	--		vernal pools	Zone 5	
California linderiella	<i>Linderiella occidentalis</i>	--	--		vernal pools	Zones 1 and 5	
valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	T	--		valley foothill riparian and oak savanna in elderberry shrubs	Zone 1	
A vernal pool andrenid bee	<i>Andrena subapasta</i>	--	--		vernal pools	Zone 1	
Ricksecker's water scavenger beetle	<i>Hydrochara rickseckeri</i>	--	--		vernal pools, wetlands	Zones 1 and 5	
coast (California) horned lizard	<i>Phrynosoma coronatum</i> (frontale population)	--	SSC		various habitats, including annual grassland, shrubland, forested habitats, and wetlands	Zone 3	lays eggs May-June
western pond turtle	<i>Actinemys marmorata</i>	--	SSC		annual grassland, wetland, forested, river, streams, lake and river margins	Zone 1	

**TABLE 3-18  
KNOWN SPECIAL STATUS SPECIES OCCURRENCES IN ZONES 1, 3, AND 5 (CNDDDB 2008) (CONTINUED)**

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Occurrence	Notes
<b>Wildlife (continued)</b>							
Foothill yellow-legged frog	<i>Rana boylei</i>	--	SSC		forest and shrubland with slow-moving stream/river	Zone 3	breeds in water March-May
western spadefoot	<i>Spea hammondi</i>	--	SSC		annual grassland, wetland, lake and river margins	Zone 5	
burrowing owl	<i>Athene cunicularia</i>	--	SSC		agricultural, annual grassland, oak woodland	Zone 5	
grasshopper sparrow	<i>Ammodramus savannarum</i>	--	SSC		Annual grassland, oak woodland	Zone 1	
great blue heron	<i>Ardea herodias</i>	--	--		wetlands, agricultural	Zone 5	
purple martin	<i>Progne subis</i>	--	SSC		Annual grassland, oak woodland, urban	Zone 1	
white-tailed kite	<i>Elanus leucurus</i>	--	FP		annual grassland, agricultural, open woodlands	Zone 1	
California black rail	<i>Laterallus jamaicensis coturniculus</i>	--	T, FP		fresh emergent wetland	Zone 1	
tricolored blackbird	<i>Agelaius tricolor</i>	--	SSC		agricultural, wetland, annual grassland, urban	Zones 1 and 5	
Swainson's hawk	<i>Buteo swainsoni</i>	--	T		agricultural, annual grassland, forested	Zones 1 and 5	Nesting period is generally March 1 to August 15

**TABLE 3-18  
KNOWN SPECIAL STATUS SPECIES OCCURRENCES IN ZONES 1, 3, AND 5 (CNDDDB 2008) (CONTINUED)**

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Occurrence	Notes
<b>Plants</b>							
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	--	SSC		woodlands, urban areas, requires roosting areas (caves, mines, etc.)	Zone 1	
Pacific fisher	<i>Martes pennanti (pacifica)</i>	C	SSC		mature coniferous and riparian forest	Zone 3	
Boggs Lake hedge-hyssop	<i>Gratiola heterosepala</i>	--	E	1B	vernal pools, marshes and swamps	Zone 5	blooms April-August
Red Bluff dwarf rush	<i>Juncus leiospermus var. leiospermus</i>	--	--	1B	vernal pools	Zone 1	blooms March-May
Ahart's dwarf rush	<i>Juncus leiospermus var. ahartii</i>	--	--	1B	vernal pools, wetlands	Zone 1	blooms March-May
big-scale balsamroot	<i>Balsamorhiza macrolepis var. macrolepis</i>	--	--	1B	chaparral, woodland, grasslands	Zones 1 and 5	blooms March-June
Brandege's clarkia	<i>Clarkia biloba ssp. brandegeee</i>	--	--	1B	chaparral, forest, disturbed areas	Zones 1 and 3	blooms May-July
Butte County fritillary	<i>Fritillaria eastwoodiae</i>	--	--	3	chaparral, woodland, montane coniferous forest	Zone 1	blooms March-May
dwarf downingia	<i>Downingia pusilla</i>	--	--	2	vernal pools, marshes and swamps	Zones 1 and 5	blooms March-May
elongate copper moss	<i>Mielichhoferia elongate</i>	--	--	2	woodlands, moist rocky areas	Zone 3	
hispid bird's-beak	<i>Cordylanthus mollis ssp. hispidus</i>	--	--	1B	wetlands	Zone 1	blooms June-September
legenere	<i>Legenere limosa</i>	--	--	1B	vernal pools, wetlands, drainages	Zones 1 and 5	blooms May-September

**TABLE 3-18  
KNOWN SPECIAL STATUS SPECIES OCCURRENCES IN ZONES 1, 3, AND 5 (CNDDDB 2008) (CONTINUED)**

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Occurrence	Notes
<b>Plants (continued)</b>							
pincushion navarretia	<i>Navarretia myersii</i> ssp. <i>myersii</i>	--	--	1B	wetlands, vernal pools	Zones 1 and 5	blooms in May
Red Hills soaproot	<i>Chlorogalum grandiflorum</i>	--	--	1B	chaparral, woodland on serpentine or gabbroic soils	Zone 3	blooms May-June
Sheldon's sedge	<i>Carex sheldonii</i>	--	--	2	coniferous forest, wetlands, riparian scrub	Zone 3	blooms May-August
<b>Habitats</b>							
Alkali Meadow						Zone 1	
Alkali Seep						Zone 1	
Northern Hardpan Vernal Pool						Zones 1 and 5	
Northern Volcanic Mud Flow Vernal Pool						Zone 1	

**Key:**

- Federal Status:
- C = Candidate
- E = Endangered
- SC = Species of Concern
- T = Threatened
- State Status:
- E = Endangered
- FP = Fully Protected
- R = Rare
- SSC = Species of Special Concern
- T = Threatened
- WL = Watch List
- California Native Plant Society
- 1B = List 1B species: rare, threatened, or endangered in California and elsewhere
- 2 = List 2 Species: rare, threatened, or endangered in California but more common elsewhere
- 3 = plant that need more information to determine their status

**TABLE 3-19  
SPECIAL STATUS SPECIES POTENTIALLY OCCURRING IN ZONES 1, 3, AND 5\***

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Potential Occurrence	Notes
California red-legged frog	<i>Rana aurora draytonii</i>	T	SSC		valley foothill riparian, wetland, lake and river margins with permanent deep water	Zones 1, 3, 5	breeds in water November-March
giant garter snake	<i>Thamnophis gigas</i>	T	T		marshes, wetlands, canals, rice field	Zones 1 and 5	fs
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	C	E		dense riparian forest	Zone 5	
Stebbins' morning glory	<i>Calystegia stebbinsii</i>	E	E	1B	chaparral or woodland on gabbroic or serpentinite soils	Zone 1	blooms May-June
Pine Hill ceanothus	<i>Ceanothus roderickii</i>	E	R	1B	chaparral or woodland on gabbroic or serpentinite soils	Zone 1	blooms May-June
El Dorado bedstraw	<i>Galium californicum</i> ssp. <i>Sierrae</i>	E	R	1B	chaparral or forestland on gabbroic soils	Zone 1	blooms May-June
Layne's ragwort	<i>Packera layneae</i>	T	R	1B	chaparral or woodland on gabbroic or serpentinite soils	Zone 1	blooms April-July
Jepson's onion	<i>Allium jepsonii</i>	--	--	1B	chaparral or forestland on gabbroic or volcanic soils	Zones 1 and 3	blooms April-August
dubious pea	<i>Lathyrus sulphureus</i> var. <i>argillaceus</i>	--	--	3	chaparral or forest	Zones 1 and 3	blooms April-May
oval-leaved viburnum	<i>Viburnum ellipticum</i>	--	--	2	chaparral or forest	Zones 1 and 3	blooms May-June

**TABLE 3-19  
SPECIAL STATUS SPECIES POTENTIALLY OCCURRING IN ZONES 1, 3, AND 5\* (CONTINUED)**

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Potential Occurrence	Notes
red-anthered rush	<i>Juncus marginatus</i> var. <i>marginatus</i>	--	--	2	marshes and swamps at elevation over 2,400	Zone 3	blooms in July
brownish beaked-rush	<i>Rhynchospora capitellata</i>	--	--	2	coniferous forest, wetlands	Zone 3	blooms July-August
Scadden Flat checkerbloom	<i>Sidalcea stipularis</i>	--	E	1B	marshes and swamps	Zone 3	blooms July-August
Bisbee Peak rush-rose	<i>Helianthemum suffrutescens</i>	--	--	3	chaparral (often serpentinite, gabbroic, or lone soil)	Zone 1	blooms April-June
El Dorado County mule ears	<i>Wyethia reticulata</i>	--	--	1B	chaparral, woodland, montane coniferous forest on clay or gabbroic soils	Zone 1	blooms May-July

Notes:

\* Excludes those species known to occur that are listed in Table 3-12

Key:

Federal Status:

C = Candidate

E = Endangered

T = Threatened

State Status:

E = Endangered

FP = Fully Protected

R = Rare

SSC = Species of Special Concern

T = Threatened

California Native Plant Society

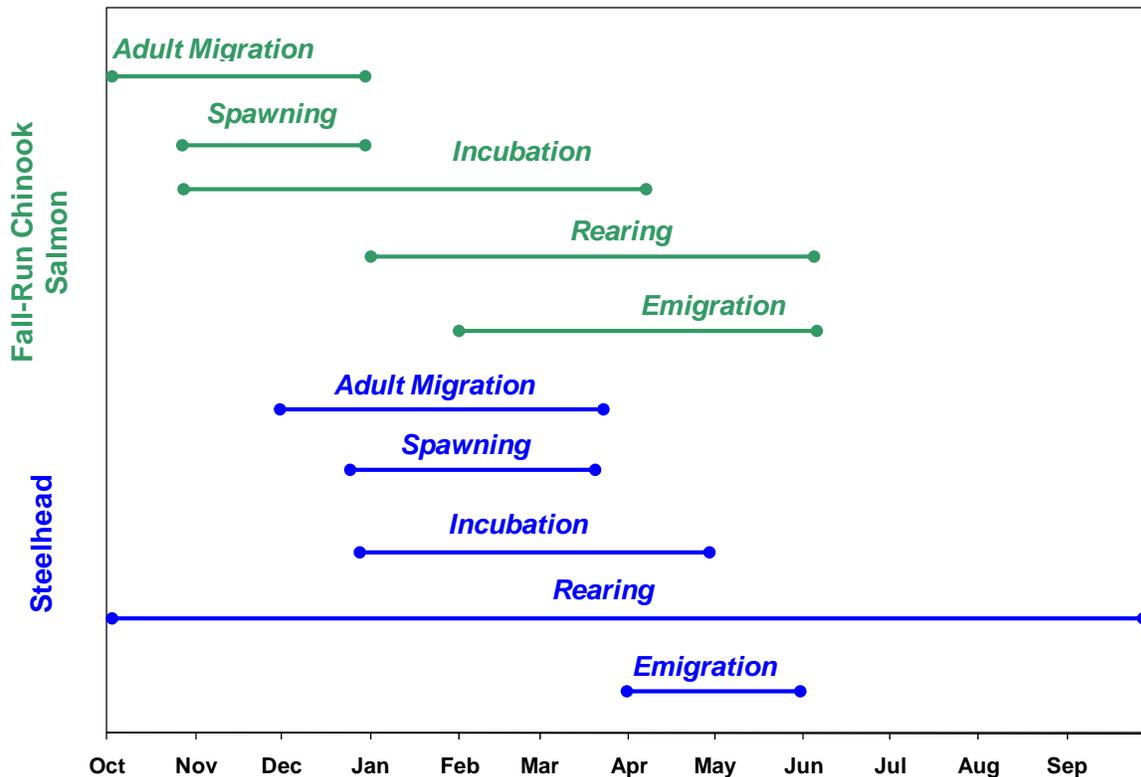
1B = List 1B species: rare, threatened, or endangered in California and elsewhere

2 = List 2 Species: rare, threatened, or endangered in California but more common elsewhere

3 = plant that need more information to determine their status

Auburn Ravine, Secret Ravine and Miners Ravine are federally designated Critical Habitat for Central Valley steelhead. Secret Ravine and Miners Ravine and are recognized by DFG and NMFS as the primary production areas in the Dry Creek drainage for Central Valley steelhead and fall-run Chinook salmon (DFG 2001). These ravines appear to be especially important for spawning and rearing of these anadromous fishes (DFG 2001).

Major life stages of fall-run Chinook salmon and Central Valley steelhead in the Auburn Ravine and Dry Creek watershed during a water year (October through September) are shown in **Figure 3-108**.



**FIGURE 3-108**  
**MAJOR LIFE STAGES OF FALL-RUN CHINOOK AND CENTRAL VALLEY STEELHEAD IN AUBURN RAVINE AND DRY CREEK WATERSHED DURING A WATER YEAR**

The timing of migration of adult fall-run Chinook salmon is determined primarily by flows and water temperatures, and migration can occur in the Auburn Ravine and Dry Creek watershed anywhere from October through December. Spawning usually occurs from November through December. From January to mid-April, fry emerge (incubation), and rearing occurs from January to June. Smolts tend to emigrate from the watershed during February through June, peaking in March to May (DFG 2003, Placer and Sacramento Counties 2003).

Central Valley steelhead migration occurs from December through March. Spawning depends on flows and water temperatures, but typically occurs from January through March. Steelhead

incubation typically occurs between January and mid-April. Steelhead rearing can occur year-round. Juvenile emigration takes place from late March through May (DFG 2003, Placer and Sacramento Counties 2003).

Substrate composition refers to the suitability of a particular sized gravel substrate (USDA 1979). Fine substrate, such as silt and suspended solids, can clog fish gills or reduce feeding, and migrating salmon will avoid or cease migration in waters with high silt loads or high turbidity. Excessive sediment loads can also decrease the fish spawning capacity of streams by clogging gravel redds.

Important habitat elements for anadromous salmonids include cover, substrate composition, and water quality and quantity (USDA 1979). Cover for fish can consist of overhanging vegetation, undercut banks, submerged vegetation, large submerged objects (i.e., logs and rocks), and water depth and turbulence. Adequate cover is most important to anadromous salmonids during rearing because they are most susceptible to predation from other fish and terrestrial animals during this time (USDA 1979).

One of the primary water quality parameters that affect fish habitat conditions is water temperature. Salmonids are cold water fish with optimum temperature requirements at different life stages. There is some debate in scientific literature on the definitive temperature range requirements for various life cycle phases of salmon and steelhead. Temperature targets for the life cycle stages of steelhead and Chinook salmon in the study area consistent with values reported in scientific literature are shown in **Table 3-15**.

Adequate water depth and streamflow are necessary for fish passage. Migration can be hampered by too little streamflow and resulting shallow water (USDA 1979). To allow for fish passage, minimum streamflows must be met. In addition, low streamflows can often result in warmer waters.