A.23 RIVER LAMPREY (*LAMPETRA AYRESII*)

photo courtesy Bradspictures.com

A.23.1 Legal and Other Status

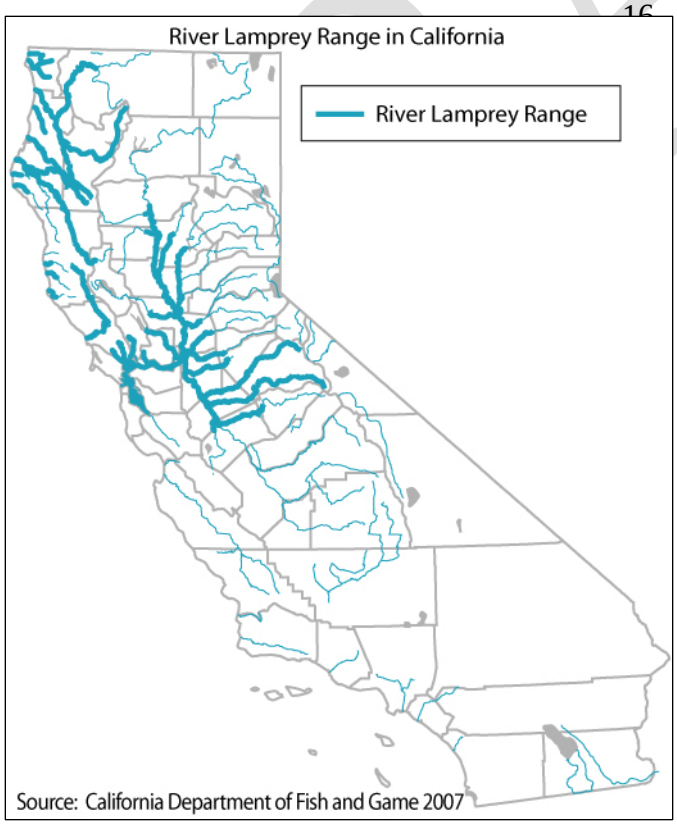
The river lamprey is a Class 3 (Watch List) California Species of Special Concern (Moyle et al. 1995, DFG 2011). It has no federal status.

A.23.2 Species Distribution and Status

A.23.2.1 Range and Status

The river lamprey is known to occur from near Juneau, Alaska, to San Francisco Bay, California. The species appears to be more abundant in the lower Sacramento-San Joaquin River system than in other streams in California, but few surveys for river lamprey have been conducted (Moyle 2002). Population trends are unknown in California, although declines may have occurred due to freshwater habitat degradation. River lamprey are common in British Columbia, the center of their geographic range.

A.23.2.2 Distribution and Status in the Plan Area



California Department of Fish and Game has no records of river lamprey within Butte County (CNDDB 2006); this species is expected to occur in the Plan Area (see Figure A-23). River lamprey are found in the Feather River from April through July upstream to the Fish Barrier Dam (SWRI 2003). This species was not reported in Butte Creek or Big Chico creeks or their tributaries, although the Pacific lamprey (*Entosphenus tridentata*) was found in Rock Creek, a tributary to Big Chico Creek (CSU Chico 1998, Big Chico Creek Watershed Alliance 1999). The species is also known to be present in the Sacramento River along the western boundary of the Plan Area (Information Center for the Environment no date).

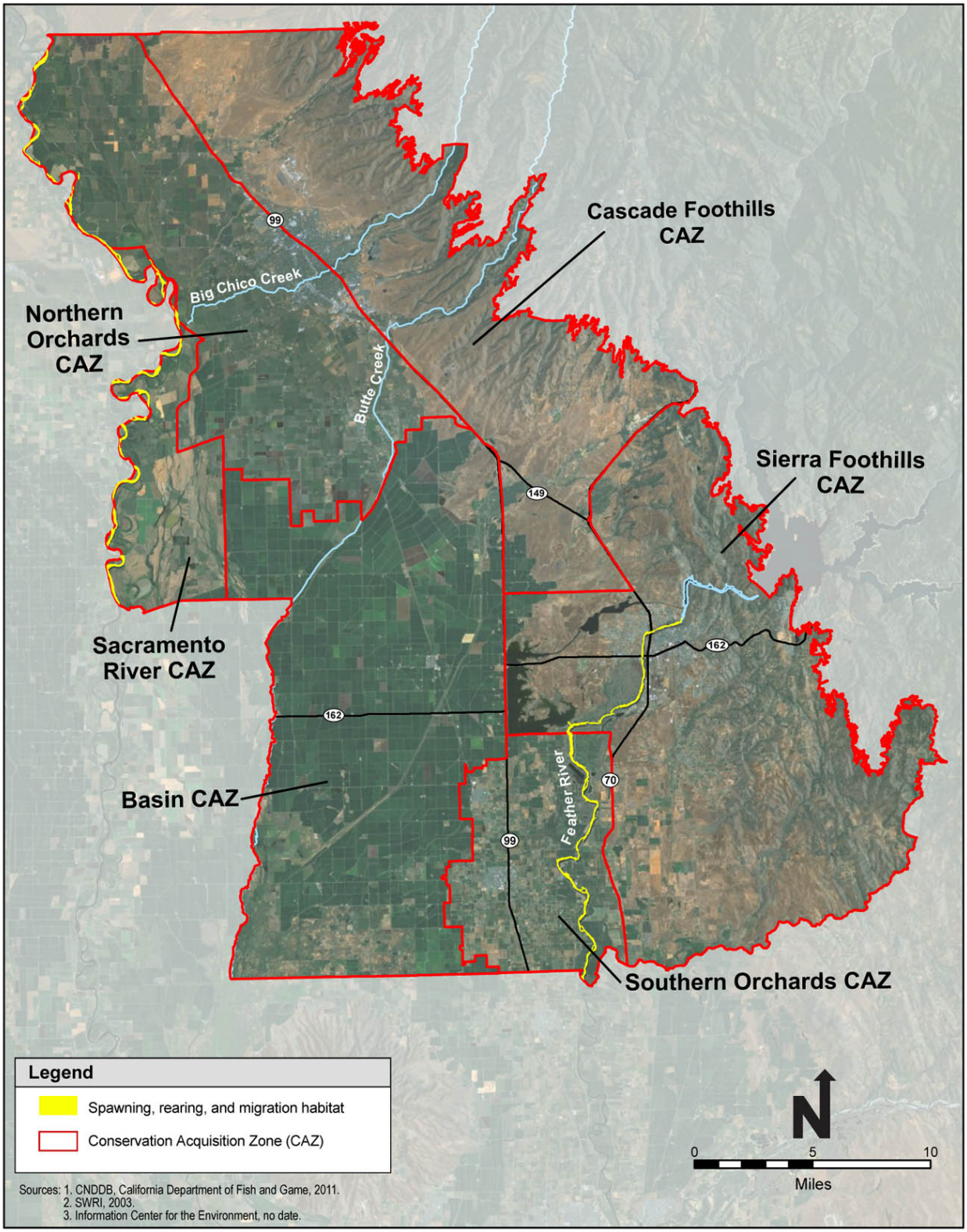


Figure A-23. River Lamprey Modeled Habitat

A.23.3 Habitat Requirements and Special Considerations

The habitat requirements of river lamprey have not been well-studied. It is thought that adults need clean, gravelly riffles in permanent streams to spawn successfully. The ammocoete stage requires high quality, perennial backwaters or stream edges over a sandy substrate, into which they burrow, with water temperatures below 25ºC (Moyle et al. 1995). Although lamprey can pass barriers that other fish cannot, large dams and other habitat modifications remain barriers to migration.

A.23.4 Life History

The biology of the river lamprey has not been studied in California; therefore, the following section is based on the biology of river lamprey from British Columbia, which may not be the same.

The river lamprey is anadromous and migrates from the ocean up rivers and streams to spawning grounds. Adults enter freshwater in the fall and move upstream to suitable spawning areas with perennial water (Moyle et al. 1995, Moyle 2002). They reach sexual maturity in streams, at which time they may shrink in length by up to 20 percent. Spawning occurs from February through May in gravelly riffles where the adults dig saucer-shaped depressions. Fecundity is not well documented, but a study of two females in Cache Creek reported that one female produced 11,400 eggs and the other produced 37,300 eggs (Vladykov and Follett 1958). Adults die after spawning. The eggs hatch into ammocoetes that remain in fresh water for approximately 3 to 5 years along sandy backwaters or stream edges where they bury in the sediments and feed on algae and microorganisms. Water temperatures of less than 25ºC are also required (Moyle et al. 1995). The ammocoetes begin to transform into adults during the summer at approximately 12 centimeters (cm) total length (TL). This process takes 9 to 10 months, and the new adults enter the ocean in late spring. They spend approximately 3 to 4 months in the ocean where they grow rapidly to 25-31 cm TL. River lamprey feed on a variety of host fish species in the 10-31 cm TL range, but the most common prey appear to be herring and salmon. They feed by attaching to their prey's back above the lateral line and eating the muscle tissue, even after the host fish dies (Moyle 2002).

A.23.5 Threats

The primary threats to river lamprey are loss or degradation of habitat through dams, diversions, pollution, stream channelization, and urbanization (Moyle et al. 1995).

A.23.6 Relevant Conservation Efforts

There have been few efforts to conserve river lamprey in the Central Valley of California. The CALFED Ecosystem Restoration Program (ERP) designated the entire lamprey family as "Enhance and/or Conserve" (CALFED Bay-Delta Program 2000). This designation indicates

that the ERP will undertake actions to conserve and enhance their abundance and distribution and the community diversity in which they live for their long-term stability.

A.23.7 Species Habitat Suitability Model

Juvenile Rearing Habitat/Migration/Spawning Habitat. River lamprey juvenile rearing, migration, and spawning habitat is defined as juvenile rearing, migration, and spawning habitat delineated by DFG (CNDDB 2007), SWRI (2003), and Information Center for the Environment (no date). River lampreys use the mainstem Sacramento River along the western edge of the Plan Area and in the Feather River as far upstream as the Fish Barrier Dam (SWRI 2003).

Assumptions. DFG and NMFS are the state and federal agencies responsible for managing river lamprey and as such are considered to be the authority on the distribution of the species and its habitat. Data gaps in DFG and NMFS information were augmented with information from SWRI (2003), and Information Center for the Environment (no date). Although not well-studied, it is thought that adult river lampreys need clean, gravelly riffles in permanent streams to spawn successfully. The ammocoete stage requires high quality, perennial backwaters or stream edges over a sandy substrate, into which they burrow, with water temperatures below 25ºC (Moyle et al. 1995). The scale of this habitat model precludes the ability to distinguish among the river lamprey habitat types.

A.23.8 Recovery Plan Goals

A recovery plan has not been prepared for river lamprey because it is not federally listed as threatened or endangered.

A.23.9 References

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