

Fish of the BCCER

The **Pacific lamprey** (*Lamperta tridentata*) is relatively small (averaging 17 centimeters (cm) and highly predaceous (Moyle 1976). Little scientific data has been collected regarding the ecology of Pacific lamprey within California. Lampreys migrate nocturnally and are less limited by dams and waterfalls than are typical fish. Lampreys spawn in both the upper and lower reaches of Rock Creek in March through May. The lamprey juvenile is a true larval form, having neither eyes nor teeth. They remain burrowed into sandy or silty backwater areas where they filter-feed on detritus. After about six years in this life stage, they metamorphose into a free-swimming, parasitic form (with eyes and teeth), that migrates to the ocean. Larval lampreys have been very common in Big Chico Creek but seem less common in recent years.

Spring-Run Chinook Salmon (*Oncorhynchus tshawytscha*) The spring-run chinook is currently listed federally as threatened and is also listed as threatened under the CESA. Populations of spring-run chinook salmon have declined throughout the Central Valley, and, in some places the hatch is maintained only by hatchery production (Moyle et al. 1989). In California, the once abundant spring-run has been reduced to small populations in the Klamath, Trinity, and Sacramento-San Joaquin River drainages. Dams constructed in the 1940's and 1950's blocked access to holding areas, causing extinction of local historical populations (Moyle et al. 1989). Hatchery production maintains the majority of spring-run populations in both the Sacramento River and Klamath-Trinity River drainages (Moyle et al. 1989). A few Sacramento River tributaries still support viable natural runs of spring-run chinook salmon. The most important have been Mill, Deer, and Butte Creeks. The historic run in Big Chico Creek was virtually extinct in the 1980's but appears to be recovering following several fixes to passage problems.

Spring-run chinook salmon enter freshwater during late winter through spring, when river flows usually are high due to rain and snowmelt runoff. They typically migrate far upstream to areas where summer temperatures are cool. Adults hold in areas near spawning grounds during the summer months until their eggs fully develop and become ready for spawning. Spring-run chinook use the BCCER for migrating, summer holding, spawning, and juvenile rearing. Preservation of their habitat was the primary driving force in establishing the reserve.

Fall run salmon spawn in Big Chico Creek when fall rains raise the flow enough so that they can get upstream. This can be as early as mid-October, but may not occur before December. Fall-run spawn shortly after entering the creek and usually in the lower reaches. They would rarely, if ever, get up as far as the reserve.

Steelhead (*Oncorhynchus mykiss*) The Central Valley population of steelhead is currently listed federally as threatened. Steelhead (an anadromous variant of the rainbow trout) is closely related to Pacific salmon. Steelhead were once abundant in California coastal and Central Valley drainages from the Mexican to Oregon borders. Population numbers have declined significantly in recent years, especially in the tributaries of the Sacramento River. Unlike other Pacific salmon, steelhead are capable of spawning more than once before they die. The steelhead-spawning season typically extends from December through April. After several months, fry emerge from the gravel and begin to feed. Juveniles rear in fresh water from one to four years (usually two), then migrate to the ocean as smolts. The period of emigration for steelhead juveniles varies, with the peak in January and February.

Steelhead migrate into Big Chico Creek between October and January. They usually spawn from Upper Bidwell park to Higgin's Hole, but may spawn in the lower reaches during low-flow years. No formal counts for steelhead in Big Chico Creek have been made. Rainbow trout are very common in Big Chico

Creek within the reserve. Some or even most of them may be steelhead, but the two are not easily differentiated.

Brown trout (*Salmo trutta*) were introduced from Eurasia. In the upper zone of Big Chico Creek they have become the dominant trout species, and have completely replaced the native rainbows in the headwaters. There are a few large brown trout in the reserve but they usually don't reproduce there.

The **hardhead** (*Mylopharodon conocephalus*) is a large (to 500 mm) torpedo-shaped minnow with a bluish tint to the dorsal surface. Hardhead occur mostly in large, undisturbed low- to mid-elevation rivers and streams (Moyle 1976). They are widely distributed throughout the Sacramento-San Joaquin River system. According to the limited literature, young hardheads eat invertebrates while larger ones feed on filamentous algae and submerged aquatic plants. Our data suggests that, at least in small streams, adults also eat snails and insects and an occasional small fish. Hardheads mature sexually following their third year. Hardhead are abundant downstream of the Iron Canyon Fish Ladder and were formerly the most abundant larger fish within the BCCER. They were eliminated by the 1986 rotenone treatment and have never recolonized.

The **Sacramento pike-minnow** (*Ptychocheilus grandis*), formerly known as squawfish is a very large slender minnow with a large mouth. While specimens in the Sacramento River may get to 1250 mm, they would not be expected to exceed 500 mm in smaller streams except in the lower reaches of tributaries where large fish migrate in for spawning in March. According to the literature, juveniles feed on invertebrates while individuals over 250 mm prefer small fish. Personal observations agree with this except that adults in small streams seem to feed as much on insects as fish. Pike-minnows usually do not become sexually mature until their fourth year

The **California roach** (*Hesperoleucas [Lavinia] symmetricus*) is a small (under 120 mm) minnow that matures at one year and seldom lives more than two years. It does well in lower elevation permanent parts of local streams including sections which dwindle to seasonal pools. Roaches are the most abundant fish in the BCCER. They feed on invertebrates and filamentous algae.

The **Sacramento sucker** (*Catostomus occidentalis*) is a component of almost all local streams. Suckers use their specialized mouths to scrape epilithon and associated aquatic insects from the substratum. Like the hardhead and squawfish, suckers usually don't spawn until four years old. Suckers were formerly common in the area, but the population has remained very small since the 1986 rotenone treatment.

The **riffle sculpin** (*Cottus gulosus*) is a lie-in-wait predators of high gradient streams. They wait quietly under rocks for prey to move near enough; grabbing anything that moves and will fit into their ample mouths. Since they are small (under 150 mm) they often get preyed upon themselves, but their cryptic habits provide enough protection for them to co-exist with larger predators like smallmouth bass and rainbow trout. Sculpins spawn under rocks; the male defends a cavity and the female attaches the eggs to the roof overhead.