The Common Freshwater and Anadramous Fishes of the Estero Bay Area

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Morro Bay National Estuary Program

California State Parks Since 1864

INTRODUCTION

The following description of fishes that are expected or known to occur at freshwater locations in the Estero Bay area during visual observations by staff over several years, historical records, published literature and unpublished reports. Species listed as Threatened, Endangered or Special Concern are treated in greater detail.

SPECIES LIST SUMMARY

The following list contains fishes that may occur in the Estero Bay area based on species distributions given in McGinnis (1984), the California Natural Diversity Data Base (CNDDB, RareFind Version 3.0.5, October 3, 2004), and various unpublished reports. If a species has been confirmed to be present, the most recent year it was observed is given under "Occurrence". If suitable habitat exists within the area but it has not been observed, occurrence is considered "Expected". Species that have not been detected and only marginally-suitable or unsuitable habitat is present within the park boundary, but in which individuals are known to occur within the region (local area), are listed as "Region". It is possible that individuals of these species may occur at the park at some point in time (such as, being washed downstream) but breeding populations are probably not present.

"Status" follows listings given by the California Department of Fish and Game (2004). Native species that are not listed as protected are broken into Common and Uncommon categories based upon a qualitative assessment of local abundance. Exotic species names are provided in red and species accounts are in alphabetical order of family names. Categories are abbreviated as follows:

FE: Federally-listed endangered species
FT: Federally-listed threatened species
SE: State-listed endangered species
ST: State-listed threatened species
SC: State species of special concern
C: Common, native species
U: Locally uncommon, native species
I: Introduced

Scientific Name	Common Name	Occurrence	Status
Ameiurus nebulosus	Brown bullhead	Region	I
Catostomus occidentalis occidentalis	Sacramento sucker	Expected	I
Cottus asper	Prickly sculpin	Region	C
Cottus aleuticus	Coast Range sculpin	Region	C
Cyprinus carpio	Common carp	2005	I
Eucyclogobius newberryi	Tidewater goby	2004	FE, SC
Gambusia affinis	Mosquitofish	2005	I
Gasterosteus aculeatus microcephalus	Threespine stickleback	2004	C
Lampetra tridentata	Pacific lamprey	Expected	C
Lepomis marcrochirus	Bluegill	Expected	I
Leptocottus armatus	Pacific staghorn sculpin	Region	C
Micropterus salmoides salmoides	Largemouth bass	1990	I
Mugil cephalus	Striped mullet	Expected	U
Onchorhynchus mykiss irideus	Steelhead – south/central ESU	2004	FT, SC
Pimephales promelas	Fat-head minnow	2004/2005	I
Platichthys stellatus	Starry flounder	2005	U

SPECIES ACCOUNTS

The use of scientific and common names follows Moyle and Davis (2000), Scharpf (2005), and California Department of Fish and Game species lists (2004). Information contained in the species accounts was largely based upon Page and Burr (1991), McGinnis (1984), and Kimsey and Fisk (1969). Photographs are courtesy of www.fishbase.org unless otherwise indicated.

Catostomidae


Photograph courtesy of www.dfg.ca.gov

Catostomus occidentalis occidentalis (Ayres 1854)

Taxonomy

The Sacramento sucker is a member of the sucker family Catostomidae.

Distribution

Native to the San Joaquin-Sacramento River drainage, and to streams along the California coast from the Mad River to the Salinas River. Likely occur in Old Creek since they have been stocked in Whale Rock Reservoir.

Habitat

Adults prefer deep water, including impoundments, while juveniles occur in shallow upstream areas. Associated with clear, cool water.

Life History

Adults are omnivorous and forage on the bottom for aquatic invertebrates, algae and organic debris. Spawning occurs after individuals are about four years old, and begins in late February. Individuals run upstream to tributaries with gravel beds to spawn. Juveniles burrow into loose stone and gravel substrates, and this behavior probably enables them to withstand flood flows and avoid predators.

Identification

Suckers are elongate fish and have a ventral mouth with big "lips" that are protractible. The tail is deeply forked. This species has a deep notch in the posterior lip, large scales, and a single dorsal fin with 11 – 12 rays (to 60 cm total length). May have a reddish lateral stripe.

Centrarchidae

Image courtesy of www.michigan.gov

Lepomis macrochinus (Rafinesque 1819)

Taxonomy: The bluegill is a member of the sunfish and bass family Centrarchidae.

Distribution: Native to the Quebec, St. Lawerence, and Great lakes areas south to the Atlantic and Gulf Slope drainages in Florida and southern Texas. Now introduced throughout the United States and Northern Mexico. They are commonly stocked in ponds as food for larger fish.

Habitat: Most often in the shallow waters of warm, clear vegetated ponds, lakes, reservoirs, rivers, and pools of creeks.

Life History: Bluegill typically build nests in large groups, called nest spawning, sometime between May and August. Males often select an area in 1 to 4 feet of water and sweep out rounded, plate-like depression with their tails for the nest. Females will then lay between 10,000 to 60,000 eggs in the nest which will be guarded by the male. The eggs hatch in approximately five days. Young bluegill most commonly forage on zooplankton while the adult diet is largely comprised of aquatic insects. Bluegill greatly vary in size (3-10 inches) but may get up to 10 inches in length where there is no overcrowding.

Identification: A deep and compressed fish with a small mouth and a long pectoral fin. Colors vary, but they most commonly have an olive back and side with clear to dusky

colored fins. The ear flap is black, and they have a black spot near the back of the dorsal fin and a dusky colored spot on the anal fin. They have a small mouth and a complete lateral line.

Micropterus salmoides salmoides (Lacepede 1802)

Taxonomy

The largemouth bass is a member of the sunfish family Centrarchidae.

Distribution

Native to the Mississippi River basin, the Great Lakes region, and the southeastern U.S. Have been introduced throughout California in most warm freshwater habitats. Known to occur in Old Creek as they were introduced to Whale Rock Reservoir for recreational fishing.

Habitat

Prefer impoundments, but can also be found in stream pools, rivers, and marshes. Associated with aquatic vegetation.

Life History

Juveniles eat zooplankton and adults are piscivores. Adults feed from the vegetated margins of aquatic habitats.

Identification

Members of the Centrarchid family have a forked tails and two dorsal fin segments, consisting of anterior spines and posterior soft rays, which may or may not be separated. This species can be distinguished from other centrarchids found locally by having an elongate bod,y and a jaw that extends past the posterior edge of the eye. They have a continuous black lateral stripe, and the dorsal fins are nearly separate. Adults are usually 30–40 cm total length, and maximum length is 74 cm.

Cottidae

Leptocottus armatus

Taxonomy

The Pacific staghorn sculpin is a member of the sculpin family Cottidae.

Distribution

Occurs from the southern Bering Sea to northern Baja California. It is known to occur in streams near Cambria.

Habitat

Occurs in the lower freshwater reaches of coastal streams, as well as estuaries and saltwater bays. They can be found in freshwater throughout the year, although they breed in brackish water. They are a bottom-dwelling fish and are usually associated with sand substrates.

Life History

Adults feed on invertebrates while in freshwater habitats and on fish when in marine or estuarine habitats.

Identification

Sculpins have their eyes oriented high on their large, flattened heads, have large pectoral fins, and lack scales. There are two dorsal fins, and the posterior dorsal fin and the anal fin are elongated down the tapering body. Can be distinguished from other local sculpins (*Cottus spp*.) by having a jaw that extends past the eye, whereas *Cottus spp*. have a jaw that does not reach a vertical line through the eye. They are also the largest species of sculpin to inhabit freshwater habitats in our area (to 22 cm total length).

Cottus asper (Richardson 1836)

Taxonomy

The prickly sculpin is a member of the Sculpin family Cottidae.

Distribution

Inhabits coastal drainages from Alaska to the Ventura River. They occur throughout low elevation freshwater habitats in California. They are known to occur in San Luis Obispo and Santa Rosa Creeks.

Habitat

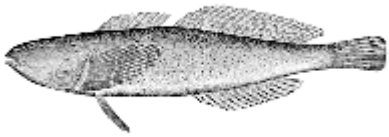
Prefers slow-moving freshwater habitats such as pools, runs, lakes, and reservoirs. They also occur in brackish water such as estuaries and they may enter tidepools.

Life History

During the day they hide under cover objects, and they have cryptic coloration. They are quite active at night, and feed on benthic invertebrates and the eggs of salmonids. Males are territorial during the breeding season.

Identification

See general sculpin description under Pacific staghorn sculpin. *C. asper* usually has 17 – 19 anal rays (but may have 15 – 16), whereas *C. aleuticus* has 14 – 15.



Cottus aleuticus (Gilbert 1896)

Taxonomy

The Coast Range sculpin is a member of the Sculpin family Cottidae.

Distribution

Occurs in coastal streams from Morro Bay north to the Aleutian Islands. They are known to occur in San Luis Obispo and Santa Rosa Creeks.

Habitat

Seems to prefer riffles, but individuals may be found in slow-moving water at the mouths of streams, estuaries, backwater areas and lakes. They are associated with gravel and rock substrates.

Identification

See general sculpin description under Pacific staghorn sculpin. This is the only local sculpin species that has long tubular upper nostrils.

Cyprinidae

Cyprinus carpio

Taxonomy

The common carp is a member of the Minnow family Cyprinidae.

Distribution

Native to Eurasia and has been introduced throughout the U.S. Observed in 2005 at the dune pond receiving runoff from the Cloisters development (Site 113). Numerous carp were seen in the storm water runoff collection pond on the development site.

Habitat

Occurs in lakes, ponds, and rivers. Associated with muddy water, organic detritus and low current speeds. Usually found in moderately shallow water in littoral zones.

Life History

May hybridize with goldfish (*Carassius auratus*), and a strain of this species is the domesticated Koi. They forage on bottom-dwelling invertebrates, gulping up substrate and spitting out sand and silt, which increases water turbidity. They also consume vascular plants, and often remove entire stands while feeding. They have high fecundity and one female can lay up to two million eggs each season.

Identification

A deep-bodied fish with very large scales that may have dark outlines. Some individuals may lack scales or have only a few extremely large scales. They have two short barbels on each side of the upper jaw (to 75 cm total length). Adults may have reddish-orange caudal and anal fins.

Pimephales promelas

Taxonomy: The fathead minnow is in the family Cyprinidae.

Distribution: Common to the Midwest and eastward; it has been introduced in the West. Orange and standard varieties found in Swallow Creek, likely introduced from upstream reservoir.

Habitat: Typically confined to small streams yet can be found inhabiting lakes. Often found in large schools, this species is very tolerant to muddy waters, low oxygen concentrations, and wide range of pH.

Life History: Primarily feed on zooplankton, microscopic plants, insects, and larvae. The fathead minnow spawns from early May through August. They deposit eggs on the surface of floating objects. The eggs hatch in 5-6 days.

Identification: A stout, cylindrical bodied fish. The belly is white and the laterals are silvery with an overall coppery tinge to the head and along the sides. Distinguished from closely related Bluntnose minnow (*P. notatis*) by a dusky band or blotch in the front and rear rays of the dorsal fin.

Gasterosteidae

Gasterosteus aculeatus microcephalus

Taxonomy

The resident threespine stickleback (Girard 1854), is a member of the stickleback family Gasterosteidae. The unarmored threespine stickleback, *G. aculeatus williamsoni*, and an unnamed subspecies known by the common name Shay Creek threespine stickleback are federally endangered. Unarmored and resident subspecies are grouped based upon morphology, instead of evolutionary history, and therefore are not true subspecies. The anadromous threespine stickleback, *G. aculeatus aculeatus*, and the freshwater subspecies may be distinct species.

Distribution

Distributed throughout North America and Eurasia, including the Artic, in freshwater and marine habitats. South of Monterey, inhabits only freshwater. The three subspecies described above occur in California. Known to occur commonly in most of our creeks.

Habitat

Inhabits streams and ponds. It prefers vegetation although it is often seen in the middle of shallow stream pools in areas lacking vegetation. It tolerates low dissolved oxygen levels and fluctuating temperatures. All subspecies breed in freshwater habitats, and marine-living individuals enter streams to breed.

Life History

Breeding occurs in spring or summer and the males defend territories. The male builds a nest of sand and vegetation that is bound together with a secretion produced by his kidneys. Males attempt to entice females to lay eggs in the nest by zig-zagging back and forth in front of them, while touching the nest's opening. Eggs and young are tended by the male. Individuals live for two or three years, and they may spawn once or twice during their lifetime.

Identification

This small fish (< 8 cm) has three separate dorsal spines anterior to the soft dorsal fin, which are inconspicous when folded down. The pelvic fins are also modified into sharp spines. When viewed from above, they often have the tail bent to one side and the eyes are high on the head. They lack scales and some subspecies (especially in anadromous populations) have 0 to 30 bony plates down the side. During breeding season males develop a red or orange throat and belly, a blue-green back, and a bright blue eye. Large females can have a pink throat and belly, or are plain-colored.

Gobiidae


Photograph courtesy on National Park Service.

Eucyclogobius newberryi (Girard 1857)

Taxonomy

The tidewater goby is a member of the goby family Gobiidae. It is the only species in the genus.

Distribution

Occurs only in California, and ranges from Del Norte County to northern San Diego County. It is known historically from about 124 localities, and has been extirpated from 28 of these sites. They are known from Old and Willow Creeks at MSSB North, but the Old Creek population is thought to have been extirpated by largemouth bass in the late 1980s.

Habitat

Occur in estuaries, lagoons and marshes of small coastal streams. They can inhabit areas up to 8 kilometers upstream from a lagoon. They are usually found in water less than 1 meter deep and at salinities less than 12 parts per thousand, but they can occur in water 2 meters deep and at salinities ranging from 0 to 42 ppt. They are found in sluggish-moving waters, and can occur in stream reaches impounded by beaver dams. Areas with

sandy substrate are used for breeding, and they also can be found on rock, mud and silt substrates. Although they are not known to inhabit marine environments, they are thought to disperse short distances in the ocean since extirpated lagoon populations were recolonized when other extant lagoon populations occurred nearby.

Life History

Bottom-dwelling and rest on substrate or cling to the sides of rocks using their pelvic fins that resemble suction cups. They feed on mysid shrimp, amphipods, ostracods, and aquatic insects. Breeding can occur year-round and peaks in early spring and late summer. Individuals usually live only one year.

Identification

Elongated fish with two dorsal fins, large pectoral fins and eyes oriented high on the head. Adults rarely exceed 5 cm. The anterior dorsal fin has a transparent section on the upper edge. The introduced yellowfin goby, *Acanthogobius flavimanus*, also occurs in central coastal California and is much larger: adults are 10 to 15 cm total length and can reach 25 cm total length. Other introduced gobies that occur in freshwater habitats of California are the shimofuri goby (*Tridentiger bifasciatus*), shokihazi goby, (*T. barbatus*), and the chameleon goby (*T. trigonocephalus*). *E. newberryi* can be distinguished from these species by having very small scales that cannot be seen with the unaided eye and are partially embedded in the skin. The native arrow goby (*Clevelandia ios*) occurs in the same habitats as *E. newberryi*, but are more slender.

Ictaluridae

Ameiurus nebulosus

Taxonomy

The brown bullhead is a member of the catfish family Ictaluridae.

Distribution

The 40+ species in this family are native to the eastern United States, and seven species have been introduced to California. It is known to occur in streams near San Simeon.

Habitat

Ameiurus spp. have the highest tolerance to low dissolved oxygen levels of any group of fish. They are bottom feeders that occur in warm eutrophic water, especially backwater areas and ponds.

Life History

Ameiurus spp. have barbels that are used to detect food along the bottom in shallow areas, and they usually feed at night. Prey include tadpoles, small fish, and detritus, and sand and mud may also be ingested. They breed in May and June. The females excavate nests in the substrate in aquatic vegetation, under roots, and in the sides of banks. Eggs are attended by both parents who fan the nest with their tails. The adults guard the fry up to 2 weeks after hatching and may carry them in their mouths. The sharp spines in their dorsal and pectoral fins can easily pierce your skin and contain poisonous substances.

Identification
This catfish lacks scales and has very slimy skin (total length to 53 cm). There are barbels that protrude around the snout. This species can be distinguished from other bullhead in California by having chin barbels that are light near the chin and dark along the rest of the length.

Mugilidae

Mugil cephalus **Striped mullet**

Taxonomy: The striped mullet is in the family Mugilidae. Originally described Carl Linnaeus in 1758.

Distribution: The striped mullet is cosmopolitan throughout coastal tropical to warm temperate waters. The Pacific Ocean range includes southern California south to Chile.

Habitat: This is a coastal species that often enters estuaries and freshwater environments. Adults form huge schools near the surface over sandy or muddy bottoms and dense vegetation. They migrate offshore to spawn in large aggregations.

Life History: They are an ecologically important link in the energy flow within estuarine communities. Feeding by sucking up the top layer of sediments, striped mullet remove detritus and microalgae. They also pick up some sediments which function to grind food in the gizzard-like portion of the stomach. Mullet also graze on epiphytes and epifauna from seagrasses as well as ingest surface scum containing microalgae at the air-water interface. During the autumn and winter months, adult mullet migrate far offshore in large aggregations to spawn. The eggs are transparent and pale yellow, non-adhesive, and spherical. Hatching occurs about 48 hours after fertilization. After the first year of life, mullet inhabit a variety of habitats including the ocean, salt marshes, estuaries, and fresh water rivers and creeks.

Identification: The body of the striped mullet is subcylindrical and anteriorly compressed. It has a small, terminal mouth with inconspicuous teeth and a blunt nose. The lips are thin, with a bump at the tip of the lower lip. The body is elongate and the head is a slightly wider than deep.

Petromyzontidae

Lampetra tridentata

Taxonomy

The Pacific lamprey (Gairdner 1836), is a member of the Lamprey family Petromyzontidae.

Distribution

Occurs in Pacific coast drainages from Alaska to Santa Ana, California. Also occurs in the Pacific Ocean throughout this region, as well as Baja California and the Pacific Coast of Asia. This species has been recorded at San Luis Obispo and Santa Rosa Creeks.

Habitat

Anadromous, with adults living mainly in the ocean or estuaries and running up freshwater reaches of coastal streams to breed. Breeding habitat is riffles and runs with gravel substrate. Larvae (ammocoestes) move downstream to areas with a high fraction of organic debris in the substrate, and spend several years buried in silt or mud in shallow, slow-moving water.

Life History

Adults are parasitic and attach to large fish, rasping a hole into the side of the fish and sucking out its body fluids. Larvae filter feed microorganisms from the water. There are landlocked populations in Oregon and northern California that are dwarfed and nonparasitic. In most populations, the adults die after breeding in upstream reaches of coastal streams.

Identification

Eel-like fish that are slippery (due to lacking scales and secreting mucus), lack paired fins, and have a cartilaginous skeleton instead of bones. They lack jaws and have a circular mouth with rasping teeth. Two low dorsal fins and the oral disc is as wide or wider than the head (to 60 cm total length). Larvae are worm-like and metamorphose at around 15 cm.

Pleuronectidae

Platichthys stellatus

Taxonomy

The starry flounder (Pallas 1788), is a member of the righteye flounder family Pleuronectidae.

Distribution

Occurs in lower freshwater reaches of coastal California streams and rivers north of Santa Barbara, as well as marine habitats in this region. They are abundant in the Sacramento-San Joaquin Delta. Individuals were observed in 2005 at Cayucos Creek and Willow Creek.

Habitat

Juveniles less than 15 cm total length inhabit freshwater and larger individuals migrate to saltwater. Juveniles occur in the mouths of streams, lagoons, and the lower reaches of rivers. Adults occupy inshore marine habitats and bays. Occasionally adults may be found in freshwater, but they are usually in poor condition. They occupy benthic habitats.

Life History

Fry are born with one eye on each side of the body, and a few weeks after hatching one eye starts to migrate to what will be the dorsal side. Though it is in the right-eyed flounder family, some individuals may have both eyes on the left side. They can change color rapidly to match the color of the substrate. Juveniles feed on invertebrates such as amphipods and crustaceans, and adults may eat fish.

Identification

A flatfish with both eyes on the same side of the head. They lay flat against the substrate and swim in short bursts parallel to the bottom. This is the only species in the family to occur in freshwater habitats in California. In brackish water, it can be distinguished from other flounder species by its alternating light and dark bands on the fins that are around the edges of the body (adults to 90 cm total length).

Poeciliidae

Gambusia affinis (Baird & Girard 1853)

Taxonomy

The western mosquitofish is a member of the livebearer family Poeciliidae.

Distribution

Native east of the Rocky Mountains. This species was introduced throughout California in 1922 for mosquito control. It has been observed commonly in most water bodies in the area.

Habitat

Occurs in fresh and brackish water. It can withstand very high temperatures, low dissolved oxygen levels, and contaminated water. Individuals usually avoid areas with fast-moving water.

Life History

Usually seen in schools just below the surface of the water. They are omnivores and consume a variety of foods (including nibbling on the fins of tadpoles) while ignoring mosquito larvae. They bear live young and can breed several times a year. This species

competes with and can eliminate small native fish species, and has negative effects on amphibian populations.

Identification

These small fish (to 3.5 cm total length) have a flattened snout and mouth that is oriented upward. The males have a greatly elongated anal fin that is used to fertilize the females' eggs internally. Pregnant females have greatly enlarged bellies. The color is drab and sometimes a dark streak can be seen along the back.

Salmonidae

Photographs courtesy of King County. Female on left, male on right.

Onchorhynchus mykiss irideus (Gibbons 1855)

Taxonomy

The steelhead is a member of the salmon family Salmonidae. Our local populations are in the South/Central Coast Evolutionary Significant Unit (ESU). ESUs are reproductively isolated and have distinct genetic, life history and ecological traits, but are not different enough from other units to be considered subspecies. ESU designations are recognized for management purposes.

Distribution

Native to western North America and the Pacific coast of Asia. Southern steelhead occur south of San Francisco Bay to northern Baja California. The South/Central Coast ESU contains populations from Pajaro River in Monterey County south to (but not including) the Santa Maria River. At Old Creek, a wild population of steelhead has been landlocked by the creation of the Whale Rock Reservoir. A hatchery propagates juveniles from individuals caught at the reservoir. The Whale Rock Reservoir population is included in the South/Central Coast ESU. There may be occasional anadromous individuals below the Whale Rock dam, and land-locked individuals may spill over the dam during floods. Steelhead are also recorded from Villa, Cayucos, Toro, Morro, Chorro, and Islay Creeks, and inland of a former barrier on Coon Creek. The genetic stock of the Coon Creek population is not understood.

Habitat

Breeding habitats have water depths 6 – 24 inches, and substrate composed of mostly gravel or mixtures of gravel with sand and cobble. Adults need water at least 7 inches deep to migrate, and can be hindered by velocities > 10 ft/s and long reaches of shallow water and obstacles. Spawning occurs at water temperatures from 39 to 52 ^{o}F and juveniles have the highest tolerance and prefer temperatures 45 to 60 ^{o}F. Individuals can, however, withstand higher temperatures for limited periods.

Life History

Steelhead are anadromous rainbow trout. Breeding occurs in freshwater streams and tributaries December through April. Juveniles emigrate to the ocean where they remain for 1 to 4 years. Adults return to freshwater to breed and unlike salmon, do not usually

die following breeding. Steelhead and resident (non-anadromous) rainbow trout interbreed, and anadromous forms can become resident.

Identification

Steelhead and resident rainbow trout cannot be distinguished based upon morphology and in fact are genetically very similar. Members of this family are elongate fish with two widely-space dorsal fins, and the second dorsal (adipose) fin is fleshy and lacks rays. Adults are silver to dark with a faint red band down the sides (to 109 cm total length). May have dark spots on the dorsal surface and tail. Juveniles have dark roundish-ovals down the sides (parr marks). They can be distinguished from salmon fry by the number of rays in the anal fins, with steelhead and trout having 8 - 12 and salmon 13 – 19.