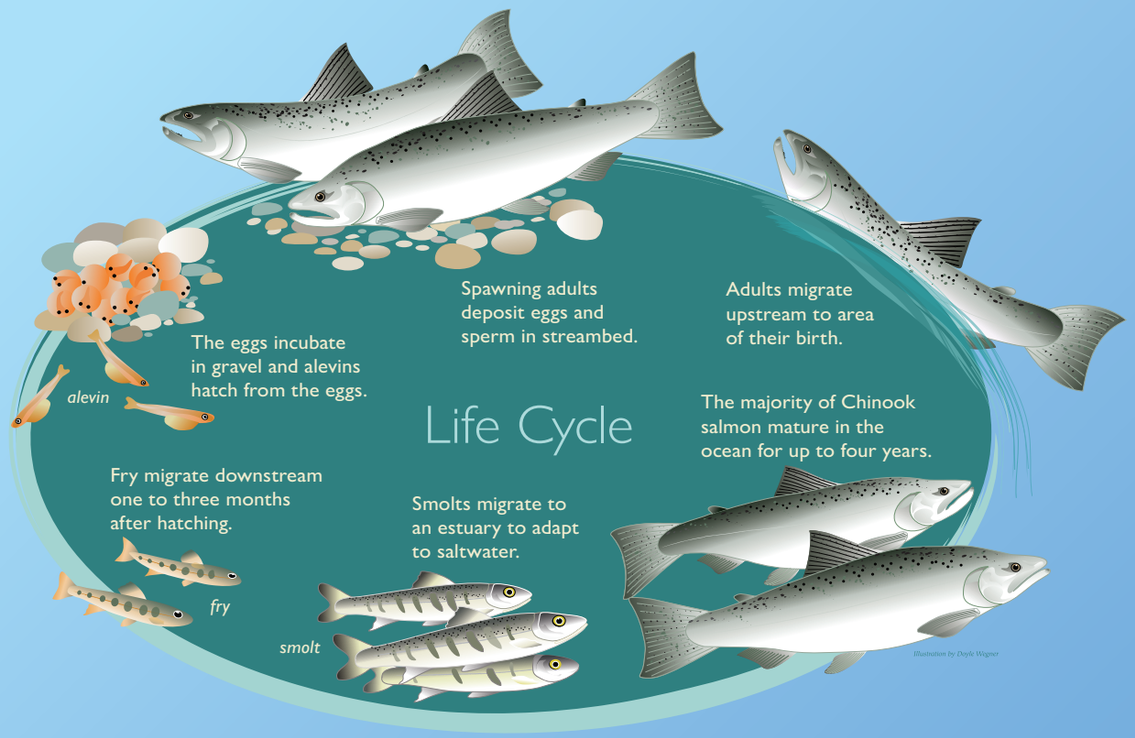
## Salmon Life Cycle

Locally native salmonids include Chinook (king) salmon, and rainbow trout (which are called "steelhead" when they return from the ocean to spawn). The 60 or so other species of the Salmonidae family are native to their own special ranges in the Northern Hemisphere. They all evolved during glacial retreat over the last 10,000-50,000 years. Salmonids have evolved to live in cooler water, which tends to hold more dissolved oxygen than warm water. Many of them, including those we have here, are "anadromous." This means they grow to adulthood in the ocean and return upstream to their freshwater birthplace to spawn.

Salmonids such as king and silver salmon and steelhead are in decline. They face many challenges. Dams, low water levels, and deteriorated habitat often block them from migrating to complete their life cycle. They also are highly prized by anglers.

The following organizations are involved in helping recover local salmonid populations:

- The Alameda Creek Alliance: *alamedacreek.org*
- Friends of Marsh Creek Watershed: *ccrcd.org/fomcw*
- The Salmon Restoration Federation: *calsalmon.org*
- The Bay Institute, Wild Salmon Viewing Map: *bay.org*




East Bay Regional Park District

*Healthy Parks Healthy People*


2950 Peralta Oaks Court, Oakland, CA 94605
1-888-EBPARKS or 1-888-327-2757 *(TRS 711)*
ebparks.org


## Visitor Centers

**Ardenwood Historic Farm**, Fremont
510-544-2797, awvisit@ebparks.org

**Big Break Regional Shoreline**, Oakley
Big Break Visitor Center at the Delta
510-544-3050, bigbreakvisit@ebparks.org

**Black Diamond Mines Regional Preserve**, Antioch
510-544-2750, bdvisit@ebparks.org

**Coyote Hills Regional Park**, Fremont
510-544-3220, chvisit@ebparks.org

**Crown Memorial State Beach**, Alameda
Doug Siden Visitor Center at Crab Cove
510-544-3187, ccove@ebparks.org

**Del Valle Regional Park**, Livermore
510-544-3146, svisit@ebparks.org

**Garin/Dry Creek Pioneer Regional Parks**, Hayward
510-544-3220 *(Coyote Hills)*, chvisit@ebparks.org
Red Barn open summer Saturdays

**Sunol-Ohlone Regional Wilderness**, Sunol
510-544-3249, svisit@ebparks.org
Open weekends

**Tilden Regional Park**, Berkeley
Botanic Garden: 510-544-3169, bgarden@ebparks.org
Tilden Nature Area/Environmental Education Center
510-544-2233, tnarea@ebparks.org



***On the cover:** Illustrations of a Sacramento perch, threespine stickleback, and a California roach.*

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# Native Freshwater Fish
## of the East Bay Regional Park District

East Bay Regional Park District

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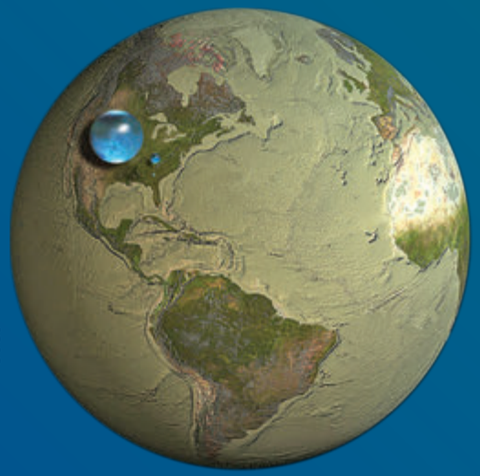
# Freshwater Fish

**Fish are the most diverse group** of vertebrates (animals with backbones). There are 32,000 species of them. Of these, four out of ten live in freshwater, which makes up less than .01 percent of the volume of all the Earth's water. If all the Earth's water were the size of a marble, every freshwater fish would be swimming in a ball of water the size of the period at the end of this sentence. That tiny droplet is the same water we use for drinking, recreation, agriculture, and industrial needs.



USGS

Fresh water is a cherished, limited resource and the East Bay Regional Park District is rooted in its protection. The District began in the 1930s with the acquisition of two reservoirs, Jewel Lake in Tilden Regional Park and Lake Temescal in Oakland. A dam was built on Wildcat Creek to create Tilden's Lake Anza. That same legacy brings with it the protection and safe-keeping of a wide diversity of native freshwater fish throughout the two East Bay counties.

Northern California's terrain is dominated by streams and rivers fed by water flowing from mountains. Ponds and lakes here are typically the result of agriculture and development needs.

Most native freshwater fish in our area have evolved in flowing water. Slender, torpedo-like bodies save energy. Dark or brownish, mud-colored backs offer camouflage protection from predators peering from above.

Isolation resulting from geographical separation (what scientists call an "island effect") causes populations to adapt to their surroundings, and in some cases they change so much over time that they become new species. The most significant geographical event tied to the development of California's freshwater fish species was the rise of the Rocky Mountains, which divided the continent's water bodies between 80 and 55 million years ago.

The fish found today in the East Bay are the product of millions of years of evolutionary change. This brochure tells only some of their stories.

## King (Chinook) Salmon
*Oncorhynchus tshawytscha*

The largest Pacific salmon, which can weigh up to 99 pounds, was once so common in the California Delta that it supported numerous canneries. Today, the number of king salmon in the Delta is relatively small and several runs are in danger of extinction.

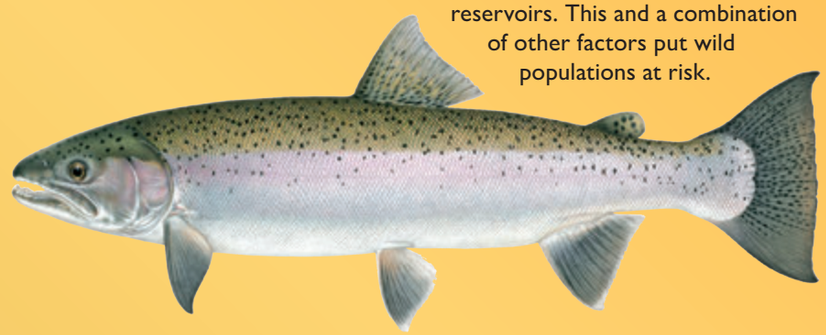
***Status:*** Endangered.
***Length:*** Up to 55 inches.

## Rainbow Trout/Steelhead
*Oncorhynchus Mykiss*

One of the earliest classifications of rainbow trout was based on fish taken from the East Bay hills in 1855. These beautiful fish were given the name Salmo iridea ("salmo" referring to trout/salmon; "iridea" means rainbow). The world's first rainbow trout hatchery was built in 1871 on San Leandro Creek. Today, trout farms are on every continent except Antarctica.

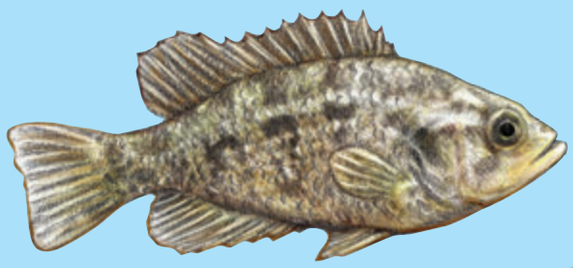
**Rainbow Trout**
***Status:*** Not at-risk.
***Length:*** Up to 30 inches.

"Steelhead" is the name given to a rainbow trout that migrates to the ocean and returns to freshwater to spawn. Unlike other salmonid species, rainbow trout can spawn year after year. Unfortunately, many wild rainbow trout tend to be blocked from the ocean by human-made water diversions, (dams) including those that form our reservoirs. This and a combination of other factors put wild populations at risk.



**Steelhead**
***Status:*** Threatened.
***Length:*** Up to 45 inches.

# Native Freshwater Fish of the East Bay Regional Parks



## Sacramento Perch
*Archoplites interruptus*

Sacramento perch are the only Centrarchids (sunfishes, black bass, and crappies) native to California. They were isolated from the rest of the North American species around the time the Sierra Nevada mountains were formed 4 million years ago. Sacramento perch populations have been in decline since the introduction of Eastern species starting in the late 1800s. These fish have been reintroduced elsewhere in California with mixed results, and their future is uncertain.

***Status:*** Threatened.
***Length:*** Up to 12 inches.

## Sacramento Pikeminnow
*Ptychocheilus grandis*

Before the introduction of non-native fish began in the 1870s, Sacramento pikeminnow were the dominant freshwater predator in the region, reaching sizes over three feet in length and over 30 pounds. Their slender bodies are well-adapted to the streams and rivers in which they grow and spawn. These fish are abundant today, but they rarely reach their full size due largely to competition by introduced sport fish including black bass.

***Status:*** Not at-risk.
***Length:*** Up to 45 inches.

## Sacramento Blackfish
*Orthodon microlepidotus*

One of California's native minnows, Sacramento blackfish are found throughout the Sacramento-San Joaquin river system, and can be spotted locally in Alameda and Walnut Creeks. They occasionally turn up in the Quarry Lakes as well as Lake Del Valle and Contra Loma reservoirs, transplanted from the Delta via a system of aqueducts. The California Aqueduct has helped them spread outside of their native habitat all the way to the reservoirs of southern California, but locally their population is in decline. They do well in other areas partly due to their ability to adapt to extreme temperatures. Under the best conditions they can grow to about 1.5 feet and survive for up to nine years. As plankton feeders that filter tiny animals and plants from the water, they are difficult for anglers to catch.

***Status:*** Threatened.
***Length:*** Up to 20 inches.

## Sacramento Sucker
*Catostomus occidentalis*

It is commonly thought that catfish are the best "bottom cleaners," but catfish are not native to California. The Sacramento sucker evolved here as an even better bottom dweller, fully adapted to the role of the vacuum cleaner. The mouth of a sucker protrudes from their underside, literally allowing them to vacuum up small invertebrates, algae, and organic material. Sacramento suckers tend to live in streams, but can also be found in reservoirs and lakes where streams and rivers once flowed.

***Status:*** Not at-risk.
***Length:*** Up to 22 inches.

## White Sturgeon
*Acipenser transmontanus*

The largest freshwater fish in North America, white sturgeon can reach sizes of up to 12 feet long and 1,800 pounds. Although they have a shark-like tail and skeleton made of cartilage, they are not at all related to sharks, but an ancient species that lived at the same time as the dinosaurs. These bottom feeders travel upstream to spawn, and are occasionally caught in reservoirs including Lake Del Valle, where they become trapped after being pumped in via the Delta Aqueduct.

***Status:*** Not at-risk.
***Length:*** Up to 12 feet.

## Threespine Stickleback
*Gasterosteus aculeatus*

Although armored with three sharp spines on their dorsal and pectoral fins, the tiny threespine stickleback can still be consumed by many birds and salmon. While they can live in salt or fresh water, most migrate into freshwater to spawn. The colorful male builds a nest of algae strands and fans the eggs with his fins while doing a "headstand." Once they hatch, he protects the young using his mouth to corral stragglers.

***Status:*** Not at-risk.
***Length:*** Up to 3 inches.

## Hitch
*Lavinia exilicauda*

Reaching fourteen inches in length, hitch (the name the Pomo Indians used for this fish) are adapted to living in East Bay streams. Their slender tail helps them move quickly, and they tolerate temperature swings that come with living in shallow water in arid regions. Occasionally found in reservoirs and ponds, hitch are abundant in Alameda Creek, where they share habitat with and occasionally interbreed with a similar species, the California roach. Hitch are egg scatterers that prefer to spawn over clean gravel in cool water. They mature around age two, and a female reaching one foot in length can lay up to 63,000 eggs in a single season.

***Status:*** Not at-risk.
***Length:*** Up to 14 inches.

## California Roach
*Lavinia symmetricus*

Similar in color to the hitch, but smaller in size (around 4 inches), California roach often share the same habitat with the hitch. In the presence of non-native fish, California roach tend to be less abundant, or absent. They typically spawn when they reach a length just under two inches at age two, but rarely live for more than three years. While spawning in large groups, these fish shuffle their bodies into the gravel to clean away silt and debris for their eggs.

***Status:*** Not at-risk.
***Length:*** Up to 4 inches.

*Fish illustrations by Sonya Palencia not to scale.*