

Harper Estuary Restoration Project – Fish Update

September 29th, 2016



If one was to do a simple observation of this section of the estuary it would be hard to see all the life in the stream, pools, and tidal waters. The fish and shellfish collected during the relocation work are common inhabitants of these habitats but often elusive to see. Predators such as wading birds and larger fish use visual cues to find them, such that these fish are frequently on the channel bottom or near structures (logs, cut banks).

Fish Relocation – Southworth Dr. Culvert Removal Project

On Monday Sept. 19th, work began on replacing the undersized culvert for Harper Creek at Southworth Drive. Part of this process is preventing fish access from the construction areas and removing the animals from sections up and downstream of the culvert. With a seine and dip nets, Washington Department of Fish & Wildlife (WDFW) biologists were able to capture and relocate over five hundred fish as well as crabs, and shrimp from a 50 foot section of stream. Most of these fish were concentrated in the scour pool downstream of the existing culvert.

What we found in the scour pool:

- 349 sculpin, including staghorn sculpin (*Leptocottus armatus*) and prickly sculpin (*Cottus asper*)
- 166 threespine stickleback (*Gasterosteus aculeatus*)
- 18 juvenile coho salmon (*Oncorhynchus kisutch*)
- 11 juvenile starry flounder (*Platichthys stellatus*)

Juvenile coho salmon use streams for rearing for up to a year before entering saltwater. Coho salmon in streams overwinter in wetlands and quieter areas whenever possible, but are subject to high flow events that can transport them to saltwater. Once flushed out of the stream, juvenile coho will generally stay in low saline water (nearly freshwater) and often move along the shoreline to seek out nearby streams or high marsh tidal creeks for rearing. These habitats are rich in food sources (insects, small shrimp, and crabs, etc.), provide refuge from predation, along with low salinity that assists in the transition from fresh to saltwater.

Harper estuary provides such an opportunity, particularly in the upper marsh where Harper Creek enters the estuary. While the coho we observed in the scour pool may have originated at nearby Curley Creek, it is also possible that some adult coho accessed Harper Creek and spawned. With the new larger culvert at Southworth, tidal exchange will be improved to provide additional rearing opportunity for juvenile coho and other fishes.

The other species we found in lower Harper Creek are commonly found in shallow saltwater environments, but are also tolerant of lower salinity habitats. Stickleback are often seen in small schools in shallow pools in the estuary, as well as in the lower creek. Staghorn sculpin are very common in the nearshore (called “bullheads” frequently) and can be observed darting along the channel bottom in tidal areas in short bursts. Prickly sculpin are limited to lower salinity habitats, such as lower Harper Creek. Starry flounder are found in saltwater, with juveniles frequently in estuaries.



Coho salmon



Starry flounder



Sculpin



Threespine stickleback

Harper Estuary fish community

Although not found at our salvage site, two other salmon species that we would expect to find in Harper estuary are Chinook and chum salmon. Both juvenile Chinook and chum can distribute widely from natal estuaries and occupy non-natal estuaries during their migration from Puget Sound. These fish rear along shallow shorelines and estuaries to take advantage of abundant food sources and as a refuge from predation. Estuaries are highly productive; the decay of the salt marsh plants and organic material form the basis of a rich food web. Fish move in with the tides and access prey washed into the tidal channels as the tide recedes. The lower salinities of estuaries and shallow nearshore also help salmon in the transition from freshwater to saltwater life history stages.



Chinook Salmon

Photo credit: Stephanie Lewis, WDFW

Juvenile chum salmon are found in the shallow nearshore from February through summer months, with peak timing in April–June. Chum are also found within Harper Estuary (south of the Olympiad culvert) and have been collected by WDFW biologists during beach seine surveys that were conducted within the estuary.

Juvenile Chinook also migrate along shallow shorelines from February through summer months, with peak timing in May-June. Beach seine surveys conducted by WDFW and the Suquamish Tribe have collected juvenile Chinook near Harper Estuary shorelines. Coded-wire tagged fish recoveries indicate that fish found on South Kitsap shorelines originate from throughout Puget Sound. Chinook have not been documented within Harper Estuary to date, but with improved tidal exchange and fish passage at Olympiad Drive, these fish may be present seasonally within the estuary.

In addition to Chinook, chum and coho salmon, cutthroat trout are also found along shallow shorelines and may be sometimes found within estuaries such as Harper Estuary.

Another fish common to Harper Estuary is shiner perch. Shiner perch are commonly observed in the pool below Olympiad Drive, particularly during summer months. Shiner perch are abundant in the nearshore waters of Puget Sound. Female perch move into warm, shallow waters in late spring and summer to give birth to live fully formed young.



Shiner Perch

Photo credit: Doris Small, WDFW

Salmon often receive the headlines but estuaries are an important resource for many other fish. Forage fish species such as surf smelt, sand lance, and herring are commonly found as juveniles in estuaries. Juvenile flatfish, stickleback, arrow goby, bay goby, pile perch, staghorn sculpin, and other sculpin species are also common estuary inhabitants.

The restoration of Harper Estuary will improve its health and function and provide food and sanctuary for fish, birds, mammals, and other species as well as providing the community an opportunity to observe wildlife. As we continue to improve degraded habitat throughout the region individual projects will add up to a big difference.