

Skagit Tidal Delta & Skagit Bay Fish Data to NOAA eDNA collaboration

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Acknowledgement of data

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- Salmon Recovery Funding Board's Intensively Monitored Watershed Program, administered by the Washington State Recreation and Conservation Office
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Data Description:

Collection methods

Beach seine

A large net beach seine method was used for sampling Skagit Bay nearshore habitat. One end of the net is fixed on the beach while the other end is set by boat across the current at an approximate distance of 65% of the net's length. After 4 minutes, the boat end is brought to the shoreline edge and pulled in by hand. Standard set area for the large net method is 486 m². The large net beach seine is constructed of 3 mm knotless nylon mesh and is 3.7 m deep by 36.6 m long.

A small net beach seine method was used to sample the site 'Freshwater Sl Boat Ramp' which is a small embayment along the right bank side of a large distributary channel in the Skagit tidal delta. The small net beach seine is set by fixing one end of the net on the beach while the other end is deployed by wading the net 'upstream' against the water current using a floating tote, and then returning to the shoreline in a half-circle. If the water is too deep to wade, the tote is towed by boat. Both ends of the net are then retrieved, yielding a catch. The set area covered by beach seine at the 'Freshwater Sl Boat Ramp' site was recorded for each set and averaged 504 m². The small net beach seine is constructed of 3 mm knotless nylon mesh and is 1.8 m deep by 24.4 m long.

Fyke trap

Fyke trap methods (after Levy and Northcote 1982) were used for sampling blind tidal channel habitat in the Skagit tidal delta. Fyke nets were constructed 3 mm mesh knotless nylon with 0.6m by 2.7m diameter cone sewn into the net to collect fish draining out of the blind channel site. Overall net dimensions (length and depth) are variable depending on the site's cross-sectional channel dimensions. All nets are sized to completely block fish access at high tide. The net is set across the blind channel site at high tide and "fished" through the ebb tide yielding a catch.

Catch processing

For each beach seine set and fyke trap catches, we identified and counted all fish by species, and measured individual fish lengths by species. When one set contained 20 individuals or less of one species, we measured all individual fish at each site/date combination. For sets with fish catches larger than 20 individuals of one species, we randomly selected 20 individuals for length samples. All Chinook, coho and steelhead were sampled to determine if the fish was natural or hatchery-origin. The presence of hatchery fish was determined if the fish had a clipped adipose fin or a coded wire tag (CWT) in its snout. Length results are fork length for species with forks, otherwise length is total body length.

Juvenile Chinook density estimates

We calculated the density of unmarked (wild) juvenile Chinook salmon for each beach seine and fyke trap set. Fish density is the number of fish caught divided by set area. Set area is determined in the field for each beach seine set. The set area of fyke sites is the bankfull channel area upstream of the Fyke trap, which was measured in the field by RTK GPS.

For fyke trap sites the juvenile chinook catch is adjusted by a trap recovery efficiency (RE) estimate that is derived from mark-recapture experiments using a known number of marked fish released upstream of the trap at high tide. Marked Chinook fry, using a partial clip of the caudal fin, were released upstream of the trap at high tide. RE is usually related to hydraulic characteristics unique to the site (e.g., change in water surface elevation during trapping, or water surface elevation at the end of trapping). Multiple RE tests (several times per season) at each site were used to develop a regression model to convert the “raw” juvenile Chinook catch to an estimated population within the habitat upstream of the fyke trap on any sampling day.

Specific data collection notes:

1. The site Freshwater Slough Boat Ramp was sampled primarily to obtain fish for mark-recapture tests to determine fyke trap recovery efficiency. Thus, for Freshwater Slough Boat Ramp sample events the catch records are complete, but fish metrics data may be lacking.
2. At the site Random Middle 364 the catch records are complete but the fish were not measured. Field notes say that there was a lot of leafy debris which could have caused a lot of stress on the fish. The crew wanted to get the fish back into the water as soon as possible to eliminate further stress.

References

Levy, D., and T. Northcote. 1982. Juvenile salmon residency in a marsh area of the Fraser River Estuary. *Can. J. Fish. Aquat. Sci.* 39:270-276.