

Salmon in Seattle

As many other natural processes, salmon's habitat in every stage of its life cycle is threatened by human activity.

This paper presents a brief description of salmon's life cycle, the consequences of the human presence around salmon's habitat, and particularly for the Wild Chinook salmon in the area of Seattle, as well as the actions taken by Seattle citizens through protection and restoration programs to improve the conditions of the waterways of salmon in this city. Of particular interest is not just what they do, but also the way this programs pretend to engage the citizens in the active participation in the difficult task of restoring and protecting salmon.

A brief approach to salmon's life cycle

Understanding how the salmon develops helps to have a handle on the effect of human activity over it. The adult salmon spawns on gravel beds in rivers and streams in a nest called redd, and then the fertilized egg develops into an alevin which find its nutrients in its own yolk. The alevin matures into a fry, leaves the redd and feeds itself in fresh water until it grows enough to begin migrating towards the ocean. During the migration, the fry is transformed into a smolt, this change helps the fish adapting to the ocean habitat. The smolt becomes adult salmon as they continue the run in the ocean, where it stays from 1 to 5 years before returning to its home streams.

Human plays a very important role in salmon's habitat destruction

In every stage of the life cycle of salmon, human activity disturbs the natural development the fish needs to follow. The main effects are related to diking, dredging, and land development as well as to the global warming and the use of oil, chemicals and other pollutants.

Sediments and floods affect the maturing process of fertilized eggs because they block the oxygen transfer, suffocating the eggs. The creation of straight channels where natural streams used to exist causes high water velocities which can wash out salmon redds, destroy the slower currents used by the fry to rest, feed and avoid predators. This is also caused because of the high storm water runoff coming from paved areas. Before the water was kept in the soil and slowly released to the waterways, now there is an unbalance flow in the streams, high when floods time, and low in months of little rain. Fast currents can move large rocks, sweep away the food of juveniles, and carry sediments to the pools with slower moving water. Low stream flows translate in a temperature rise above levels that are beneficial for juveniles.

Global warming plays a role in the habitat of salmon in the ocean, changes in water temperature displace salmon food resources, forcing salmon to spend more energy searching for food or eating lower quality food.

After saving all these obstacles, salmon still have to return and spawn. Unfortunately there is a lack of passage to their natal streams, and they have, again, to spend energy finding the way back and many times dying before spawning.

The use of chemicals and other pollutants that end up in the water streams also challenges the salmon to identify their natal streams when they return as adults.

All these shows that besides having to survive the already difficult natural environment, the salmon has to overcome the obstacles left by the human foot print in order to exist.

Why is the urban area of Seattle relevant for the salmon protection?

Seattle is a critical area on the run of the wild Chinook, the main streams and water bodies related to it are Lake Washington, Lake Union, the Ship Canal, the Duwamish Waterway and Puget Sound. All the activities that take place in this region affect directly or indirectly the quality of its habitat.

Seattle takes action in protecting Wild Chinook's space.

The Organization City of Seattle is running a long term program with the cooperation of scientists, government and citizens in which the problem is attacked from different fronts. They are designing shoreline projects; conservation plans are being developed for the watersheds in which salmon runs, and other city actions are being undertaken to reduce water pollution, protect shorelines and restore urban creeks.

Projects in the restoration of shorelines include the placement of sand and gravel in eroded beaches and addition of dunes and wetlands on the coast, plantation of native vegetation next to water streams, the transformation of lawns to wetlands and the connection of those wetlands to the streams with the purpose of enhancing the nutrient content for the juveniles. Some others are related to the proper construction of piers and locks so salmon has have the light they need, other project near to the navy stations, pursues the removal of construction debris from the water, and reconstruction of wetlands and a lake existing in former times. Other projects aim to create optimal shallow waters for the juvenile Chinook, removing docks and tiers, introducing vegetation and adding salt in some sites to help the fish adapting to brackish water.

The people are actively participating to restore salmon's home creeks

Regarding the watersheds in which the wild Chinook travels in their lifetime, Seattle is actively working together with neighbor communities for which salmon protection is also a responsibility. They aim to build a holistic conservation plan for the four watersheds in which salmon live: Cedar River/ Lake Sammamish, Green/ Duwamish, Snohomish/ Tolt and Skagit.

Other city actions are classified in:

- Improving best management practices: a pilot project on street construction is taking place. The aim of it is to show how to manage stormwater on situ through natural processes like the infiltration in small gardens next to the streets. In this

way, the water runoff during floods is better handled and the impact on the streams of the area is diminished.

- Regulating development: The Department of Design, Construction and Land Use is in charge of the long-range planning in Seattle. They develop the policies and codes related to environmental protection, development, housing and community standards. All these policies are becoming tighter with the time, and in the case of salmon there is no other direction to go but make it stricter every time.

In the matter of regulation, the increased awareness of the problem, creates a collaboration of government and citizens to watch for the salmon's habitat. For instance, regional conservation groups take the task to report to the government when an irregularity is taking place.

- Restoring urban creeks: For this the program Urban Creeks Legacy was created, aiming to restore creek habitat, improve drainage and water quality, sustain creek systems through long-term stewardship and education and celebrate the role of the urban creeks in the natural and created environments of Seattle. Two of the projects they currently run are the Creek and Backyard Stewardship.

The way this last Urban Creeks Legacy program functions is interesting, because it calls for the participation of all citizens even when they do not live close to a water stream, and it involves them in the problem directly. One clear example is the Backyard Stewardship, its purpose is to convince people of adopting gardening practices that are friendlier to the environment. Whether they live next to a creek or not, is irrelevant, the good gardening practices transmission of pollutants to the creeks. This approach is translated to the citizens as "your backyard is the home for the wild Chinook salmon", whatever harmful substance you add to it, goes also for the salmon.

Puget Sound chinook was listed as Threatened under the ESA in 1999, it may be extinct in 15 years, this is a statement from a study commissioned by a national conservation group, in the US. That is the result of nothing else but putting the nature to serve only human purposes, building convenient straight water streams, increase the agricultural productivity with the extensive use of fertilizers and pesticides, producing hydroelectric energy, among many other activities.

Movements like the one happening in Seattle is the least we can do, to diminish the already spread footprint of humans over the salmon habitat.

Many of the projects have been carried out with success, effort that must be appreciated and followed by other cities in respect to their own specific ecological issues.

References:

<http://www.cityofseattle.net/salmon/default.htm>

<http://www.washingtontrout.org/hatchnoticepr.shtml>

http://www.pbs.org/newshour/bb/environment/jan-june98/salmon_6-23.html