BEST PRACTICES

The Tale of Two Salmon

One spawns in the cold water gravels of low gradient streams; one is spawned artificially. One is a determined jumper; one stops migrating at obstacles. One is visible in South Sound freshwater in September and October; one is visible in November and December. One weighs about 9 to 11 pounds; one weighs about 15 to 20 pounds.

What are these salmon? The hatchery raised Deschutes River Chinook and the wild McLane Creek chum.

These two salmon have the same general salmon life cycle, but they have different life histories and strategies. Both are anadromous, which means they return to freshwater to spawn. As smolts, they migrate to the Pacific Ocean where they will feed and grow large. Both the Deschutes Chinook and McLane chum spend about 3 to 5 years in the ocean feeding. The Chinook will have individual adults that will return earlier and stay longer. Chinook can grow to be the largest of all salmon. The salmon that escape predation and harvest, and fend off disease and other climate and ocean-related conditions that effect mortality, use "homing" to return to South Sound. Scientists know that salmon use a highly sensitive olfactory system to smell scents in the water, which help guide them back to their natal stream. After spawning, they die. But, within this general life history, there are differences that have evolved with these two species that would enable them to coexist in the same watershed and not outcompete with each other for spawning and feeding grounds. The life cycles described are "typical" for these two salmon. And, of course, there are always exceptions.

Natural ~ Wild Life Cycle – McLane Creek Chum

Over the last three decades, the chum salmon populations of Puget Sound have increased to the point that they are now the most abundant salmon species in the region. Chum salmon are distributed throughout the river systems of the Puget Sound region, which includes the streams of north and south Puget Sound, Hood Canal and the Strait of Juan de Fuca. This region's chum stocks have been grouped into three run timings; summer (spawning in September and October), fall (spawning in November and December) and winter (spawning in January and February). The fall run is the largest segment of overall chum returns; typically making up 90% of the annual total number of chum salmon returning to Puget Sound. (*Source: Washington Department of Fish and Wildlife*) McLane Creek chum are part of this fall run return.

At the beginning of the winter rains, adult chum salmon return to the icy waters to reproduce and then die. The chum salmon spawn anywhere from the lower mouth of McLane Creek up past the protected area of the McLane Creek Nature Trail. They also spawn in tributaries to McLane Creek: Swift, Cedar Flats and Perkins Creeks. WDFW staff do fish surveys during the spawning season to count the number of salmon along different reaches of the

creeks. For the past ten years, an estimated 6 to 10,000 chum have returned to McLane Creek. Swift Creek had an estimated 12 to 25,000 and Perkins Creek, 700 to 3,000.

The adult salmon are colored with hues of brown, green, purple and black. The males have intricate mottling of purple, green and brown in bar patterns that circle the body cavity. The females have this similar coloration, but it is faint. Their primary distinguishing color is a dark stripe running from the gills to the tail. Both males and females have the ability to "adjust" the coloration on their bodies. Males can show a dark strip similar to a female, and females can minimize the coloration of their stripe. The color changes are part of the courtship behaviors swimming toward and on the spawning grounds.

Chum are not jumpers, and will stop migrating if a large obstacle is in the way. A few years ago, a large log jam up creek of the Delphi Road Bridge forced more chum to spawn in Swift Creek. Males arrive to the creek before the females. As the fish approach freshwater, their bodies are changing to spawn. They stop eating, change from marine colors to spawning colors, start developing eggs or milt, change osmotic body functions to adjust from salt to fresh water, and males and females develop teeth, with the males developing a prominent hooked snout and impressive teeth.

On the spawning grounds, it's the only time during the salmon's life that people can approach the fish and watch their amazing, but slow, courtship and reproduction. The observer must be quiet and still and be extra careful not to spook the fish, which an unsuspecting sudden movement can do. Children and dogs should be monitored and everybody needs to stay back and out of the creek. McLane Creek has three structures to watch the fish from: two viewing platforms and the bridge. Often the water is low, so it's easy to see the salmon. Salmon Stewards carry polarized viewers, which can enhance viewing on the rare sunny November day. Eventually, the spawning grounds will include both live and dead salmon. Late in the season, you can smell the salmon carcasses from the trail.

Behaviors to watch for:

Guarding (a nest), resting/holding, quivering (males), fighting, digging (females), spawning (eggs and milt deposited in gravel)

The female digs a pit or nest in the gravel for each spawn. The final "redd" is comprised of a few nests. She spawns with different males for each nest and often more than one male "sneak" in to fertilize the eggs. The female will cover the eggs with gravel as she digs the next nest. The eggs are heavier than water, so they sink into the gravel. At this point, they are shock resistant when the female is digging gravel to cover them, but they will lose this temporary protective coating and will be vulnerable for a period of time before another process occurs to protect the eggs. The survival of the eggs is dependent on clean, oxygenated water flowing through the gravel. Sediment-filled water can smother the eggs. Polluted water can kill the developing embryos. High water flow that causes scour can also kill the eggs. Once the eggs hatch, the tiny alevin can move between the gravel spaces. After the egg develops and the tiny salmon emerges from the

Interested in seeing Chinook or chum salmon?

You can see Chinook salmon from mid-August through early September at the 5th Avenue bridge in downtown Olympia. In mid-September through early October you can see wild chum salmon at Tumwater Falls Parks. In early November through early Devember you can see wild chum salmon spawning at the McLane Creek Nature Trail. Trained Salmon Stewards are frequently onsite to help answer any questions you may have. For maps to the viewing sites, go to: www.streamteam.info/getinvolved/educate/salmon/

Would you like to be a Salmon Steward at McLane Creek this fall?

Contact Ann Marie pearce for more information at 360-754-3355 ext. 6857 or email pearcea@co.thurston.wa.us

gravel, this species typically migrates directly to marine waters, at the size of 1 to 1.5 inches. Because of their small size, chum fry are particularly vulnerable to predation. The estuary habitat is critical for the survival success of chum fry. A healthy estuary provides the food resources necessary for early growth, and can offer refuge from numerous fish and bird predator species. In the near shore environment and open ocean, competition for food resources with other fish species has been shown to affect growth and survival of chum salmon.

Last fall, chum salmon were spawning in the newly restored pocket estuary in Eld Inlet at Allison Springs, located between Mud Bay Road and Highway 101.

Deschutes River Hatchery Chinook

Chinook salmon are associated with big rivers with large gravel. The largest salmon caught on record weighed 126 pounds (caught in 1949 in Alaska), so it's easy to imagine these fish need a large river with lots of water and large gravel. The Deschutes River did not have a historical salmon run, due to the lower falls creating an impassible barrier, when the Green River salmon were planted in Capitol Lake in the 1950's. When the adult salmon returned to Percival Creek, some were moved by truck to the upper Deschutes to start a natural run. Shortly after, the fish ladders were built around the falls and the small dam above the falls. In the early 1960's, the holding ponds were built in Tumwater Falls Park, creating an adult trapping facility managed by Washington Department of Fish and Wildlife.

Over the past 50 years of managing this hatchery run, different strategies have been used. The best science and the Endangered Species Act (ESA) are the current drivers for the fish management at the facility. As a hatchery run, these Chinook salmon do not fall under the ESA. This salmon run is managed specifically for commercial, tribal and sport fisheries. The returning adults are the "escapement" salmon – the ones that escaped harvest. When they arrive at the 5th Avenue Dam in August, these salmon have been thousands of miles from Olympia feeding in the Gulf of Alaska. Their bodies no longer have the silver marine coloration, but now are shades of brown and green with black. The males have the hooked snout and teeth. As the females have begun to develop the eggs, the lower body cavity begins to swell. Both males and females have stopped eating. The fish weigh about 15 to 20 pounds; although, a much smaller fish is often spotted. This salmon, called a jack, is a mature male that only spent one year feeding in the ocean before beginning the return migration back to freshwater.

The salmon congregate and swim around below the 5th Avenue dam, often in pursuit by hungry seals. The fish ladder is always open, so the fish can swim into Capitol Lake whenever they are ready. They may hold longer in Budd Inlet because Capitol Lake water is too warm or they are not ready to spawn, or their bodies are adapting from salt to freshwater. After they pass the dam and swim through the lake, they are met with the challenge of swimming up three fish ladders, for a total of 82 feet elevation. The last fish ladder ends in the holding ponds. The journey stops here for the salmon. Beginning in the third week in September, on Monday, Wednesday and Friday mornings, the salmon are processed. The processing

goes on for 4 to 6 weeks. Over 1,000 males and 1,000 females will be artificially spawned. The egg take goal is 4.8 million eggs. The eggs and milt are kept separate and transported to Minter Creek hatchery near Gig Harbor for the fertilization and incubation. Some of the hatchery-origin Chinook (without an adipose fin), will be sent upriver for nutrient enhancement of the Deschutes River. The remaining salmon are sent to a fish processor: much of the salmon will be filleted and frozen and given to food banks, the lower quality salmon will be used for animal food or fertilizer, and the eggs (in the unspawned females) will be sold for bait or food.

In the spring, the hatchery-raised baby salmon are now 2 to 3 inches big. They are brought back to the holding ponds and held for two weeks to imprint the scent of the Deschutes River. In total, 4 million fry will be released in batches of about 500,000 every two weeks from April to June. The cycle continues, as these fry migrate out of Capitol Lake and into Budd Inlet, then out to the wider Puget Sound and eventually to the Pacific Ocean. Within a few years, some of them will return to complete the life cycle again.

For your dog's safety, keep your pet at home or in your vehicle when salmon are spawning. Salmon can be infested with a parasite that causes "Salmon Poisoning Disease" in dogs, which can sicken and even kill your dog.

Source: Stream Team News, Fall 2013