STATE OF WASHINGTON
DEPARTMENT OF FISH AND WILDLIFE
HABITAT PROGRAM
Science Team

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TO: Hal Beecher

FROM: Steve Boessow

SUBJECT: Cascade Creek on Orcas Island

I have attended four site visits of Cascade Creek on Orcas Island, June 7, 2005, April 25, 2007, March 28 2007 and June 14, 2007. Together, the four trips covered Cascade Creek from Mountain Lake to Buck Bay, Summit Lake and the upper and lower sections of Paul Creek, and the Rosario Utilities Diversion from their dam on Cascade Creek downstream to Cascade Lake. On only one trip, June 2007, did we attempt to capture and identify fish. This report is meant to describe the fish species present in Cascade Creek and offer some information about their life histories in fresh water. It compliments work done by WDFW and others over at least the past 10 years and supports 50 years of documented salmon and trout presence in Cascade Creek.

Cascade Creek is aptly named, having a series of numerous waterfalls between its source at Mountain Lake and its outlet at Buck Bay. While there is very good habitat in many of the reaches between the cascades, there is very limited opportunity for fish to move upstream more than a few hundred yards or less in most areas. Despite this limitation trout seem to be surviving and breeding in the short reaches and salmon return and spawn in the limited anadromous reach downstream.

I am limiting discussion of fish presence to salmonids (salmon, trout and char). We have documented other fish species, especially in the lower reach accessible to the estuary and salt water. I am also limiting discussion to mainstem Cascade Creek. Lakes and tributaries that connect to Cascade Creek may have a somewhat different species mix. Species life histories descriptions provide generic timing information. An annual survey of migrating and spawning fish would be required to narrow run timing date ranges.

Lower Cascade Creek
Lower Cascade Creek, from the lowest impassable falls to Buck Bay is known to be inhabited by coho and chum salmon, sea-run cutthroat trout, eastern brook trout and juvenile chinook salmon.

Coho salmon (*Oncorhychus kisutch*) have been reported in Cascade Creek as early as the 1950's. There appears to have been a mix of native stock and Nooksack/Samish coho

planted as part of supplementation efforts through remote site incubators or egg boxes. Currently, only naturally spawning wild coho return to Cascade Creek. Spawning occurs September through November. Juveniles remain in freshwater for 1-2 years before migrating to saltwater. Coho return as early as August, though September is more common and are typically three year olds, having spent 1-2 years in saltwater.

Chum salmon (*Oncorhynchus keta*) most likely occur in Cascade Creek as a combination of wild production and human intervention. Egg boxes are still used below the falls as well as documented natural spawning. Chum salmon enter freshwater in September or October and spawn October through December. Chum will use creek margins, various sized gravels and most habitat types for spawning. They are not strong jumpers and will be stopped by small barriers that would pass other salmon and trout. Fry emerge from the gravel January through June and migrate to the estuary within a few days.

Sea-run coastal cutthroat trout (*Oncorhynchus clarki*) use Cascade Creek throughout the year. Adults return to spawn in the winter, typically December through February. Juveniles may reside in freshwater up to six years, although 1 or 2 is more common. Cutthroat may move between fresh and saltwater for feeding and then return to their natal stream for spawning. Cutthroat trout are repeat spawners.

Chinook salmon (*Oncorhynchus tshawytsha*) are not known to spawn in Cascade Creek. However, juvenile chinook have been documented using the creek during the spring. Fall chinook typically migrate to saltwater as sub-yearlings and then rear in estuaries and small streams.

Brook trout (*Salvelinus fontinalis*) were found in low numbers below the lower falls in a 2003 survey conducted by Wild Fish Conservancy and in observations made by Washington Department of Fisheries staff in the 1990's. In northeastern North America brook trout are known to have both an anadromous and resident form, much like our cutthroat and rainbow trout. There is no known record of a salter (sea-run brook trout) in Washington.

Cascade Creek above the lower falls

Mountain Lake is the primary source of water for Cascade Creek. In past years it has been stocked with eastern brook trout, kokanee (landlocked sockeye salmon) and cutthroat trout. Recent years have only seen cutthroat and triploid rainbow trout stocked in Mountain Lake. Current and past fish planting activities are available on the internet at http://wdfw.wa.gov/fish/plants/index.htm. There are records of brook trout and cutthroat trout in Cascade Creek. I have not discovered any record of kokanee or rainbows in the creek.

Brook trout (*Salvelinus fontinalis*) appear to be the dominant fish species in Cascade Creek. In a June, 2007 survey, brook trout were found in every location in which an effort was made to catch fish. It is likely that they are the progeny of earlier downstream migrations from Mountain Lake. Multiple age classes, including juveniles, were found in

several stream reaches. Brook trout are a char, recognizable by the lighter spots on a dark background and by the scattered red spots along their sides.

Brook trout are fall spawners, usually spawning between August and December. Given low flows in Cascade Creek during the late summer/early fall it is unlikely that they would begin spawning until October. Brook trout reach sexual maturity at 2-3 years, and, like cutthroat, are repeat spawners. Brook trout are non-native to western North America, and may eliminate native cutthroat through competition and displacement.

Resident coastal cutthroat trout (*Oncorhynchus clarki*) have been reported in Cascade Creek above the anadromous zone. Like the brook trout, they are likely progeny of past downstream migrations out of Mountain Lake. Resident cutthroat, once in Cascade Creek cannot move back to Mountain Lake for rearing. The dams and falls precluded any opportunity for upstream migration. Resident cutthroat typically spend their entire life within a 500-600 foot reach. They spawn between March and July although past experience with cutthroat indicates spawning is usually complete by May. The absence of resident cutthroat in seine net samples may indicate displacement by eastern brook trout.

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