

Introduction:

Skookum Creek Watershed is located in Mason County, WA. The mainstem of Skookum Creek is approximately 12 miles long with a basin area (mainstem and tributaries) of 20 square miles (**Figure 1**).

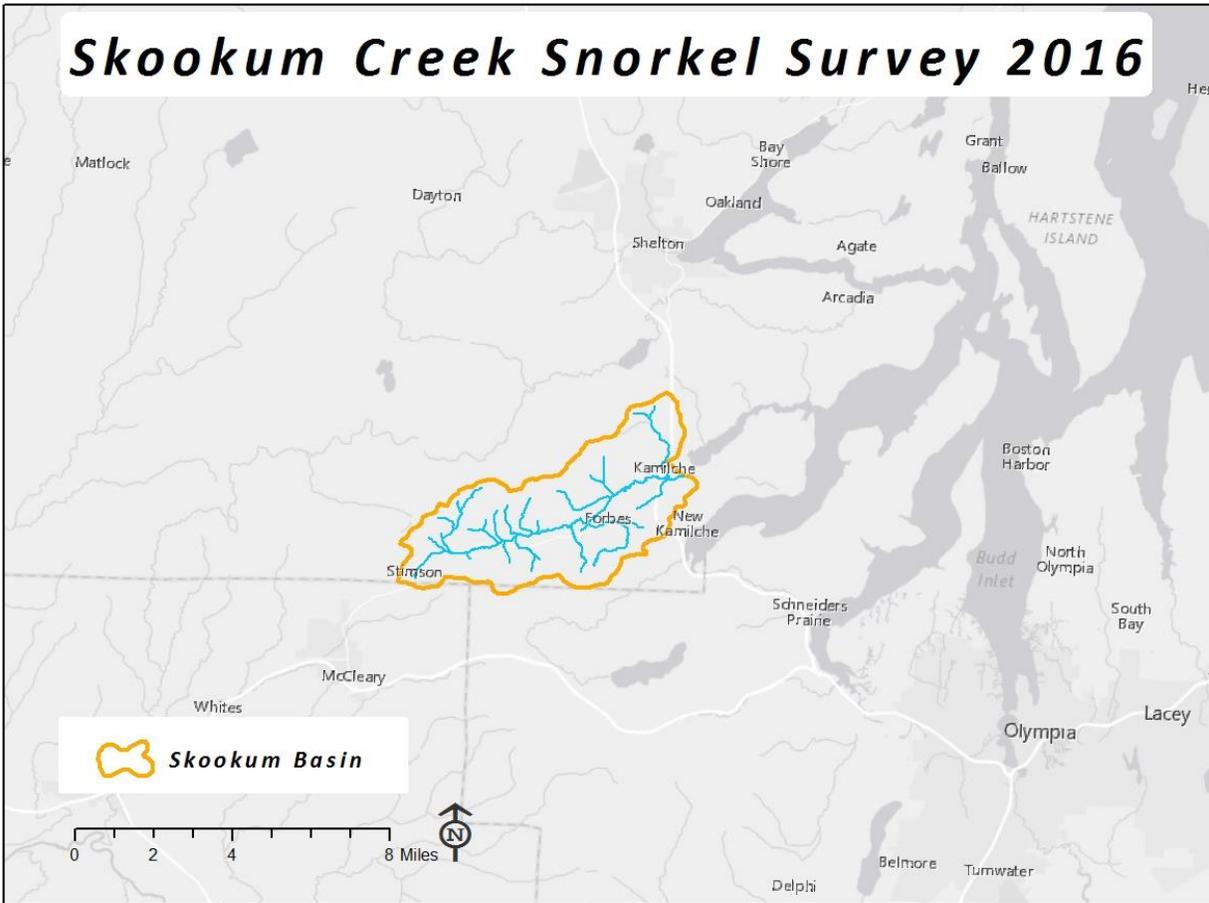


Figure 1. Skookum Creek Watershed Locator Map

Skookum creek and its tributaries begin in groundwater-fed headwaters and flow through managed timber lands, agricultural lands, the Squaxin Reservation, a small commercial/residential area in the lower watershed and exit through a Natural Preserve Area as it enters Skookum Inlet in South Puget Sound. The watershed consists of varied habitat types from complex, riffle-pool habitat with spawning gravels and good riparian cover to channelized, homogenous habitat with excess fines and areas of minimal to no riparian habitat. Skookum Creek supports several salmonid stocks including Fall Chum, Coho, small populations of steelhead, and robust populations of both searun and resident cutthroat trout.

Skookum Creek is federally listed (303d) for impaired waterbodies with elevated instream temperatures and excess fines as two primary factors for the listing. A cursory analysis of over 10 years of Spawner survey data indicates robust chum stocks that are well distributed throughout the watershed. Over 15 years of smolt trap data for Coho indicate no significant change in coho production for the Skookum Creek Watershed and overall relatively low abundance in out-migrating coho salmon.

Survey Timing, Methods and Locations:

Snorkel surveys were conducted in Skookum Creek on August 30th, September 7th and September 9th, 2016. Snorkel surveys were conducted in an effort to locate juvenile Coho within the watershed during summer base flow conditions and identify any trends in preferred habitat conditions/parameters as well as [potential] limiting factors. FLIR (Forward Looking Infrared) data, collected from flights on August 13, 2004, were used in order to identify potential cold water input areas (gaining reaches) and areas that were recorded at 16°C and colder. Snorkel Surveys were completed using the Salmonid Field Protocols Handbook (*American Fisheries Society. 2007. Salmonid Field Protocols Handbook. Johnson et al., Chapter 10*)

For the purposes of these initial surveys, there were two major factors that were assessed in order to identify stream reaches to be snorkeled, temperature and habitat. Two temperature parameters were used in order to prioritize stream reaches for on-the-ground assessment. A temperature change of 1° (C) or greater observed within the FLIR data were used as a survey parameter threshold for cold water input areas. Additionally, areas of 16° (C) and colder were selected given the known optimal temperatures for juvenile Coho. Two reaches were selected that, while outside of the optimal temperature range for juvenile Coho (temps were elevated well above optimal temperature ranges for juvenile Coho), there were intact habitat features that have been identified as preferred habitat conditions for salmonids and necessary for proper functioning conditions. Reach SK4 was identified based on intact riparian areas along both sides of the stream. Reach SK2 was a multi-year restoration site where multiple engineered log jams have been installed (**Figure 2**).

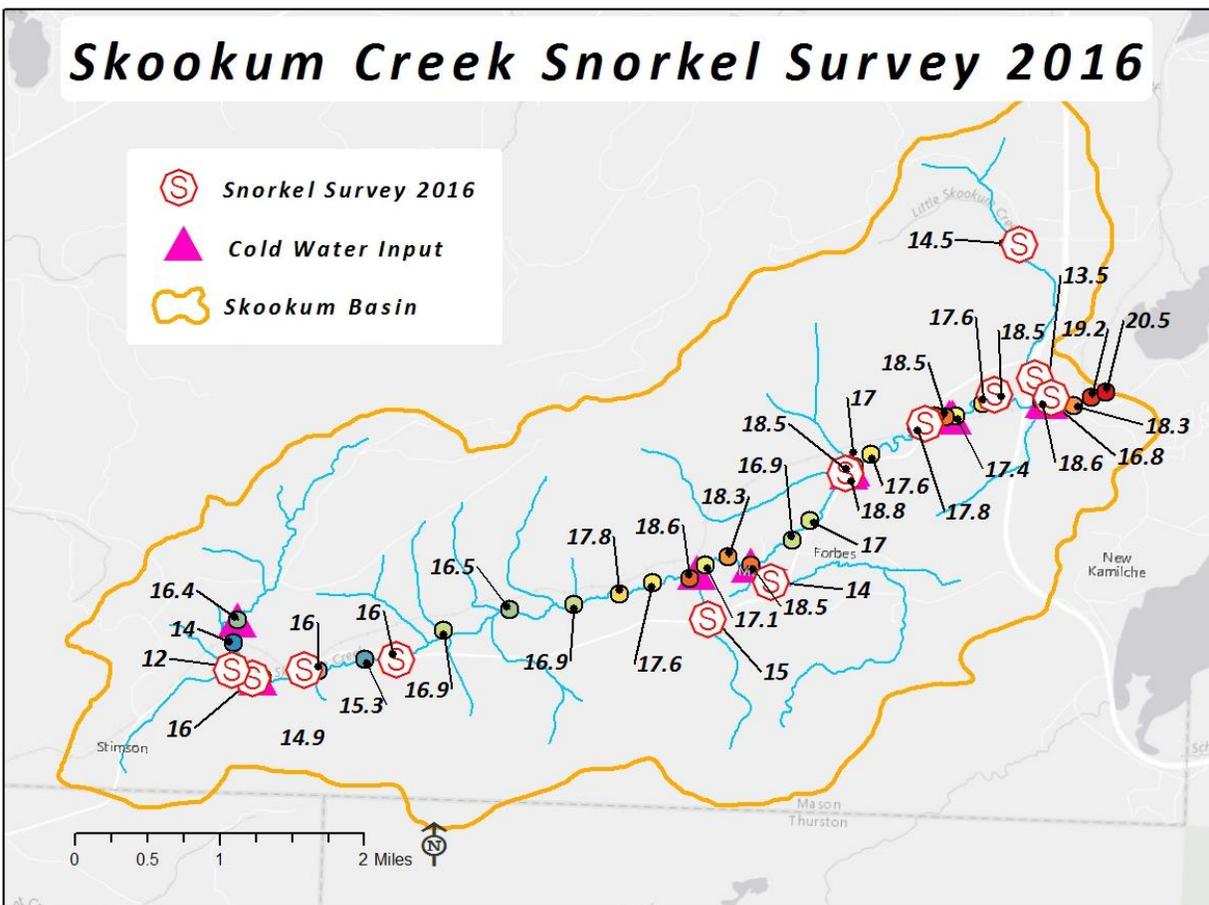


Figure 2. Snorkel Survey Sites, cold water input areas and temperature regime based on FLIR data

Observations:

Of all the reaches surveyed only those within the optimal temperature range (16° C and below) were found to have juvenile Coho occupancy (**Figure 3**).

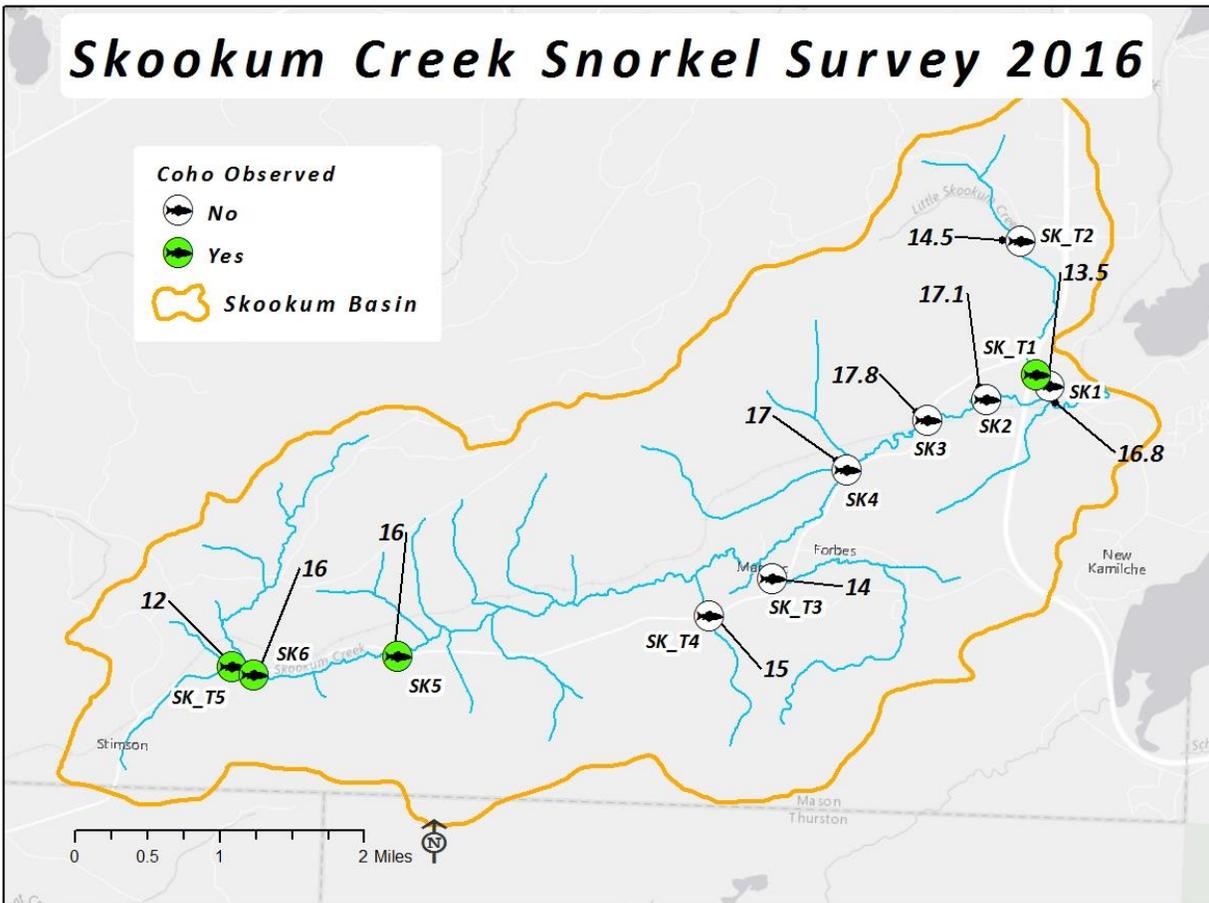


Figure 3: Observed Coho during 2016 snorkel survey

Adult Cutthroat trout were observed in most, but not all, of the other survey reaches. However, only one juvenile trout was observed in areas that had temperatures of 17 °C or higher and indications of temperature induced stress were apparent. Additionally, pool habitat was overwhelmingly the preferred instream habitat type being utilized by Coho. Cutthroat trout tended to utilize a greater variety of instream habitat types, but greater numbers were observed in pool habitat over other habitat types.

Survey results from this survey would indicate that temperature is a more significant factor for juvenile Coho use rather than intact/functioning habitat features. However, more data is needed. Additional snorkel surveys will be conducted in 2017 that will include a resurvey of the initial survey reaches from 2016 and expand to additional reaches within the watershed.