Lake Washington/Lake Sammamish Invasive Species Research and Removal Efforts: Muckleshoot Indian Tribe (MIT) and WDFW predator removal test fisheries, MIT Pilot small-scale predator removal commercial effort, and MIT invasive species population size research

Several research activities are proposed to occur within the Lake Washington area. These studies are all designed to remove warm water fish species that prey on salmon and steelhead in the Lake Washington watershed, or to further inform the development of warm water fish predator removal fisheries. These proposals are summarized here and incorporated by reference (Mercier 2020).

MIT Warm-water Species Test Fishery

The Muckleshoot Indian Tribe (MIT) proposes to continue implementation of a test fishery to collect information on the feasibility and potential impacts of a directed ceremonial, subsistence, and commercial warm water fish species fishery in the Lake Washington Basin. This work has occurred, in this form, for the last three years. The 2020 test fishery will take place from early May and June 12th, 2020 and from January 1-April 30, 2021. Over the past three years, the MIT has developed a warm water test fishing study area which is divided into eight zones (Figure 1). The test fishery timing and locations will minimize encounters with ESA-listed species, including steelhead, and will use gear designed to avoid these species as well (Mercier 2020). The test fisheries proposed for 2020-2021 will occur in Lake WA zones 1-4 (Figure 31). During the first three years of the study, 2017, 2018 and 2019, no steelhead were encountered in the test fisheries (Warner 2019). There we a small number of rainbow trout captured in the test fisheries (1 in 2017, 11 in 2018, 0 in 2019) but these were determined by size, mark status, physical appearance, to not be steelhead. Over the three prior years of this work there have been zero Chinook adults caught in these fisheries. There have been several immature, lake-residual Chinook (blackmouth) caught in the test fisheries—11 total in the three years and 446 total net nights of testing (Mercier 2020). Only a couple of these have been unmarked fish (personal com., Jason Schafler, MIT, April 2020).

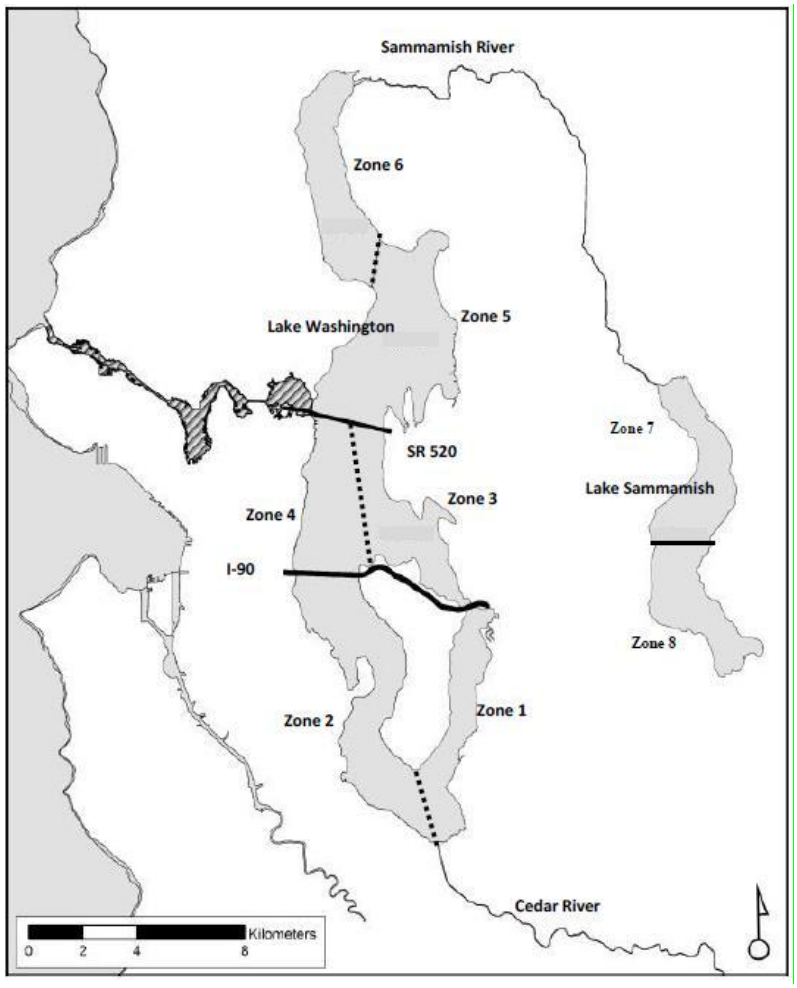

Figure 1. Muckleshoot Indian Tribe proposed warm water test fishery zones (1-8) and exclusion areas (cross-hatched) that will not be fished in order to minimize the potential for adult steelhead encounters (Mercier 2020).

MIT Warm-water Pilot Net Fishery

In addition to the continued test fishery described above, the MIT have proposed to conduct a small-scale pilot commercial fishery, targeting non-native warm water species, and based on the findings of the prior years' testing. This initial, small-scale commercial effort is planned for March 1-April 30, 2021 and would occur in warm water test fishery zones 5 and 6 (Figure 31) in North Lake WA. The small-scale effort is designed to allow for thorough monitoring of the fisheries as a transition to potential larger scale warm water fisheries in the future. The proposed locations and timing of the fisheries is also designed to reduce potential encounters of listed adult Chinook salmon or steelhead, due to the seasonal run-timing of the extant Chinook and coho being summer/fall and winter, respectively, and the North Lake WA tributaries having observed no adult steelhead spawning in the area for the last several years (**Error! Reference source not found.**). Additionally, the proposal limits the gear used in the fishery to the gears used in previous years' test fisheries and limits the number of nets per fishery.

MIT Warm-water Lake Sammamish Electrofishing

One of the underlying pieces of missing information, with regard to development of a potential management plan for warm water fisheries in Lake WA, is an estimate of the overall abundance of these non-native fish in the system. To date, the MIT test fisheries have focused on the efficacy of gear types and development of locations with adequate catch numbers to foster interest and participation. To get at the overall viability of a fishery, in terms of time horizon for effective overall removal of these species, an assessment of the scale of the populations in Lake WA and Lake Sammamish is being proposed to begin in 2020. The MIT have proposed to conduct an electrofishing survey and mark-recapture tagging program in Lake Sammamish. Lake Sammamish was chosen due to its smaller size, the presumed smaller population of the target fish species, and for the lower likelihood of encounters with ESA-listed species utilizing seasonal migratory corridors (Mercier 2020). These fisheries are proposed for a fall and spring period. The fall period for 2020 would be utilized for equipment training and testing and would only be employed for a couple of days and after Chinook adults have cleared the lake (Late Oct-Nov). The spring 2021 Sammamish electrofishing work is proposed for the March 1-June 30 period (personal com., Jason Schafler, MIT, April 2020). MIT proposes to employ best practices in conducting this electrofishing work, utilizing the protocols developed for electrofishing for warm water species (Bonar et al. 2000), including areas were listed non-target species of fish exist (Mercier 2020).

The potential for take of listed Chinook salmon and steelhead, as well as the life-history of the fish that could be impacted varies between the three components of the overall MIT warm water fisheries proposed above. The continued test fishery in the South Lake WA and the small-scale pilot commercial fishery in the North Lake WA are not likely to encounter juvenile Chinook or steelhead, due to the size of the gill nets utilized (larger than these fish) and the results of the prior years' work, however, they can impact these species at sub-adult or adult sizes. The timing and location of the fisheries, during the late spring and early summer (May 1-June 12) will likely reduce the potential for interaction with adult Chinook and steelhead, given the fall run-timing of the Chinook and the winter run-timing of potential steelhead encountered.

Unlike the net fisheries involve with the test and pilot commercial efforts, the electrofishing gear effect any species and life history that it comes into contact with, including juvenile listed Chinook and steelhead. The choice of Lake Sammamish and the period of March 1-June 30 should reduce the likelihood of encounters with adult Chinook salmon, while the extremely low observed numbers of adult steelhead in the Lake WA system in general and the North Lake WA tributaries specifically (Mercier 2020), reduce the likelihood of encountering adult steelhead significantly. As such, the MIT has proposed the following levels of expected take, in the form mortalities, for each component of the proposal in Table 1.

Table 1. Expected maximum levels of incidental mortality of ESA-listed Lake WA Chinook and steelhead, by life stage, associated with the 2020-2021 MIT Warm water predator-removal

studies.

MIT Warm Water predator removal component	unmarked Chinook juveniles	Unmarked Chinook sub-adults	Unmarked Chinook adults	Unmarked Steelhead juveniles	Unmarked Steelhead Adults
Lake WA test fishery cont.	0	5	5	0	3
Pilot Commercial fishery	0	8		0	
Sammamish Electrofishing	7	0	0	3	0
Total	**7**	**13**	**5**	**3**	**3**

((Mercier 2020); pers. com. Jason Schafler, MIT, April 2020)

The MIT proposals also state that there would be monthly reporting on status of work, in general, and immediate reporting of NOR Chinook and steelhead encountered in these proposed fisheries.