

2008 Progress Report

Swan Valley Bull Trout Working Group



Bull Trout

Background

The Swan Valley has historically been home to a stable, healthy bull trout population. A popular recreational bull trout fishery has persisted in Swan Lake due to the maintenance of quality spawning habitat in the Swan River drainage and the absence of competing non-native species, especially lake trout. Lake trout have contributed to the decline of bull trout populations in the Intermountain West. In 1998, anglers began reporting adult sized lake trout (20-30 inch) in Swan Lake and Swan River. In 2003, Montana Fish, Wildlife & Parks (MFWP) began capturing juvenile lake trout during routine gill net monitoring. This evidence of lake trout reproduction in the lake led biologists to determine that lake trout are a growing threat to bull trout of Swan Lake, as well as Lindbergh Lake and Holland Lake upstream in the Swan drainage.

In 2004, the Swan Valley Bull Trout Working Group (SVBTWG) was formed. The SVBTWG is composed of five government agencies and Trout Unlimited. The group determined that, if left unchecked, it is a matter of time until lake trout will become the dominant piscivore in the Swan River ecosystem. Annual reports have been prepared since 2004. Previous annual reports can be found on our website at www.montanatu.org, under the “Swan Valley Bull Trout Working Group” link.

Organization and Vision

In 2005, after a series of working meetings, six entities formally combined as the *Swan Valley Bull Trout Working Group* (SVBTWG). The SVBTWG consists of representatives from Montana Fish Wildlife & Parks (MFWP), Montana Department of Natural Resources and Conservation (DNRC), Confederated Salish and Kootenai Tribes, Trout Unlimited, U.S. Fish and Wildlife Service (USFWS), and the Flathead National Forest. The group signed a Memorandum of Understanding pledged to collaborate and share resources to “ensure the long-term, self-sustaining persistence of bull trout as the dominant piscivore within this (Swan) ecosystem”.

Accomplishments

In 2005, biologists employed available gear and manpower in an attempt to sample lake trout in Swan Lake. However, inefficient gear limited our ability to capture any lake trout. In 2006, we conducted some exploratory gill-netting in order to capture adult fish to implant with acoustic transmitters. Although a number of juvenile lake trout were captured, no mature adults were captured.

In 2007, we contracted with Harbor Fisheries, a Wisconsin based company with specialized gear and experience in capturing lake trout. Harbor Fisheries deployed gill nets and two deep-water trap nets over a three-week period in September. A mark-recapture study was conducted to estimate the number of lake trout in Swan Lake. Biological samples and measurements were also collected to characterize the population.

In addition, 19 adult fish were released with acoustic transmitters to track during the spawning season.

Low recapture rates in 2007 led to uncertainty about the accuracy of the population estimate among members of the SVBTWG. In 2008 we contracted with Harbor Fisheries again to set roughly twice the amount of gill net for a three week period in early September. Trap nets were not deployed in 2008 due to limited success with them the previous year. The inefficiency of the trap nets in 2007 possibly reflects that the lake trout population is heavily skewed towards smaller fish. All lake trout captured were removed from the lake and a population estimate was generated based on the decline in catch over the three-week sampling period. Biological samples and measurements were taken and six more mature male lake trout were released with acoustic transmitters. Roughly 1,500 lbs of lake trout were donated to the Flathead Valley Food Bank and local raptor rehabilitation centers.

By-catch of bull trout and other species was low in both 2007 and 2008. Lake trout made up 71% of the total catch in 2007 and 87% of the total catch in 2008. Our sampling efforts resulted in 141 direct bull trout mortalities in 2007 and 100 direct mortalities in 2008.

The size distribution of lake trout captured indicated that the majority of this population consisted of juvenile fish (Figures 1, 2). Similar length distributions were observed in 2007 and 2008, with obvious peaks occurring at 240 and 330 mm. These peaks correspond to three and four year age classes respectively. The strong year classes of lake trout aged three and four observed in 2007 and 2008 suggest that lake trout recruitment has been high in the last five years. However, there is some evidence that the age three year class was weaker in 2008. Lake trout greater than 500 mm were in excellent condition in both years (Figure 3). Lake trout in Swan Lake had the highest growth rate observed among several populations in the Intermountain West (Figure 4). Based on the rate of decline in catch through the three-week sampling period in 2008, we estimated between 7,300 and 10,500 lake trout greater than 165 mm in Swan Lake at the start of netting efforts in 2008. We removed 3,784 lake trout in 2008, which is between 36-52% of the total estimated population.

Tracking mature lake trout implanted with transmitters during October and November 2007 and 2008 successfully identified two primary spawning locations in Swan Lake. Many fish congregated at two locations near Montana Highway 83 where the substrate consists of clean, coarse gravel-cobble substrate on a steep slope. Mesh bags buried in the substrate by SCUBA divers confirmed that egg deposition was occurring at these locations. Three hundred and fifty-six eggs were collected in 58 nets, roughly the size of a five-gallon bucket, buried in spawning substrate. Eggs were present in the substrate from 10 to 25 feet. Short-set gill nets also confirmed the presence of ripe adults at these locations. Knowledge of these two locations will allow for the efficient removal of adult lake trout during the spawning period from mid-October to mid-November. Continued monitoring of adult lake trout movement during the spawning period will be necessary to identify other less frequently used spawning locations, if they exist.

Public Education

The SVBTWG recognizes the necessity of good communication with the public, and it was the primary emphasis in 2008. We agreed to strive for a high level of angler awareness of the lake trout problem. In 2008, we worked to keep the public informed through a series of news releases to the local media and presentations to local conservation groups. Informational posters and brochures remain available to the public. In 2009, a creel clerk will be surveying anglers on Swan Lake to collect catch data and disseminate information to the public.

Monitoring of Bull Trout and Ecosystem Trends

The ultimate goal of the SVBTWG is to protect the existing bull trout populations in the Swan drainage by minimizing negative impacts of lake trout. For that reason, it is important to track bull trout populations and other indicators to gauge success. Figure 5 illustrates the current information on Swan Lake bull trout redd counts. Redd counts dipped slightly in 2008, due in part to difficulty in surveying some streams with heavy concentrations of downed timber from a 2008 windstorm. MFWP also conducted annual surveys of kokanee salmon and Mysis shrimp densities. Currently there is no evidence that the lake trout population has affected either species, but monitoring indices may not be sensitive enough to detect early changes. Successful suppression of the lake trout population will keep lake trout density below a level where they will adversely affect the bull trout population. The young age structure, high condition and growth rates of lake trout suggest that this population is still expanding. If the density of lake trout can be contained at low levels through removal efforts, we should continue to observe a lake trout population structure similar to 2007 and 2008 (i.e., heavily skewed towards small fish). At this time eradication of the lake trout population in the Swan drainage is not feasible, given existing control methods available. However, removing a minimum of 50% of the lake trout population annually may help maintain a relatively low density.

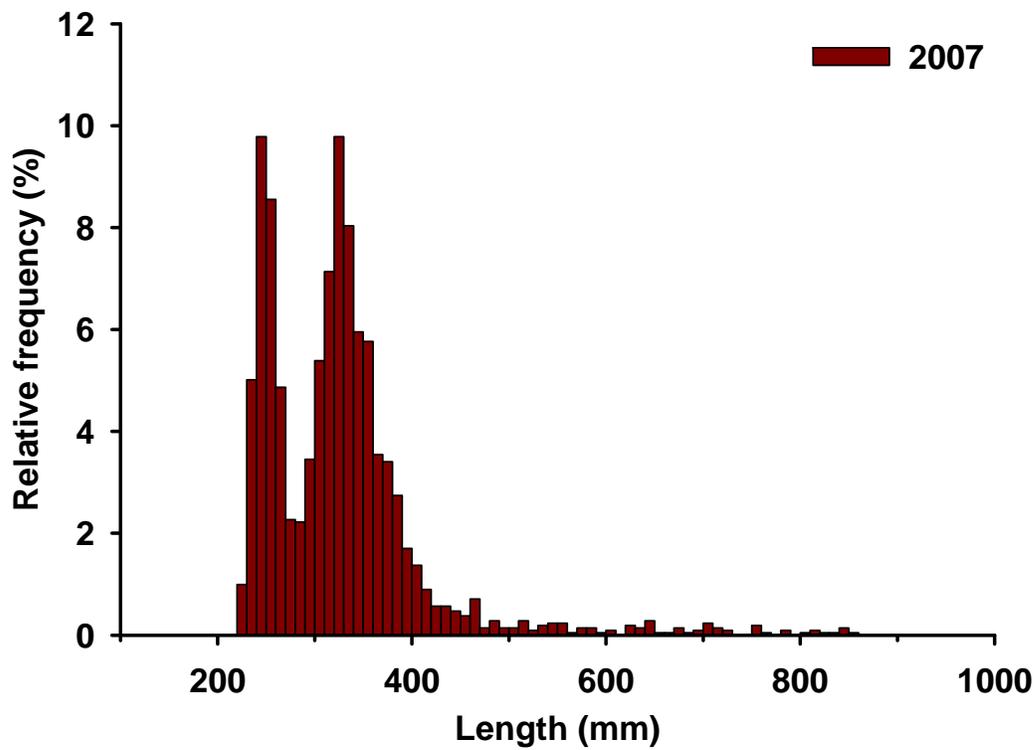


Figure 1. Length frequency distribution of lake trout captured in Swan Lake using gill nets in 2007.

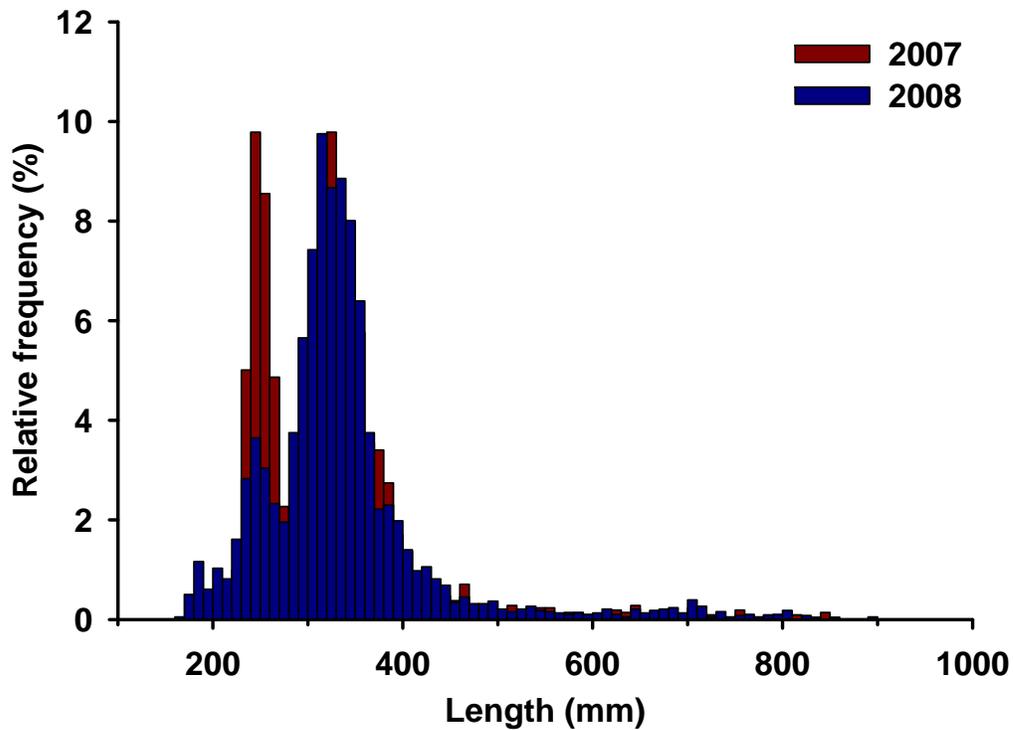


Figure 2. Length frequency distributions of lake trout captured in Swan Lake in 2007 and 2008. Large, adult fish are still relatively uncommon.

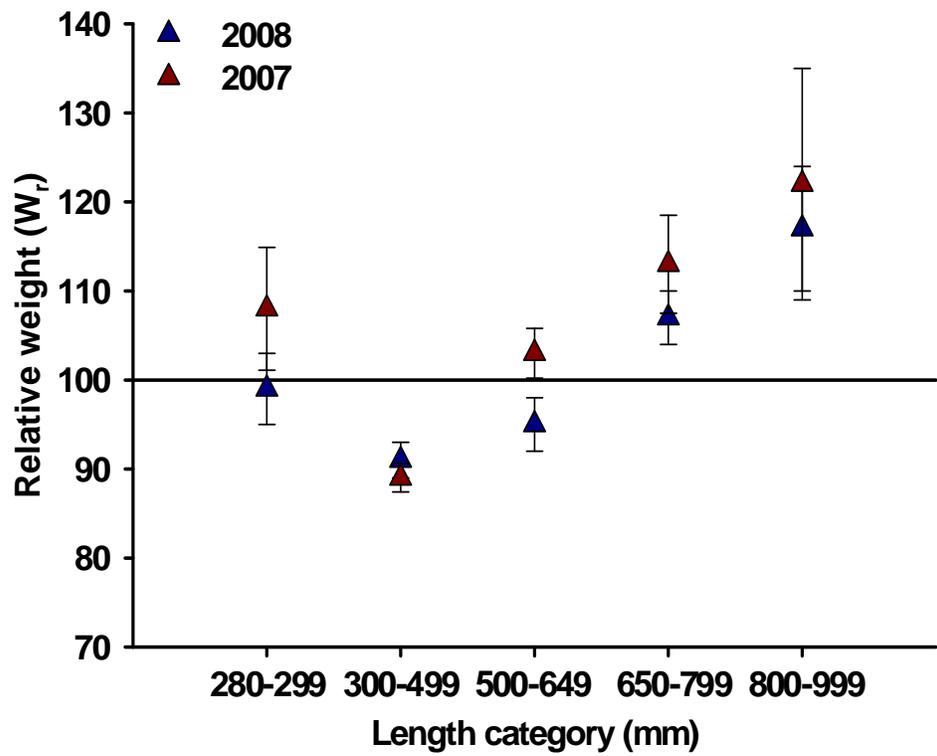


Figure 3. Condition of lake trout captured in Swan Lake in 2007 and 2008. Fish above the Relative weight line tend to be heavier than other populations of that length size, suggesting good growth rates.

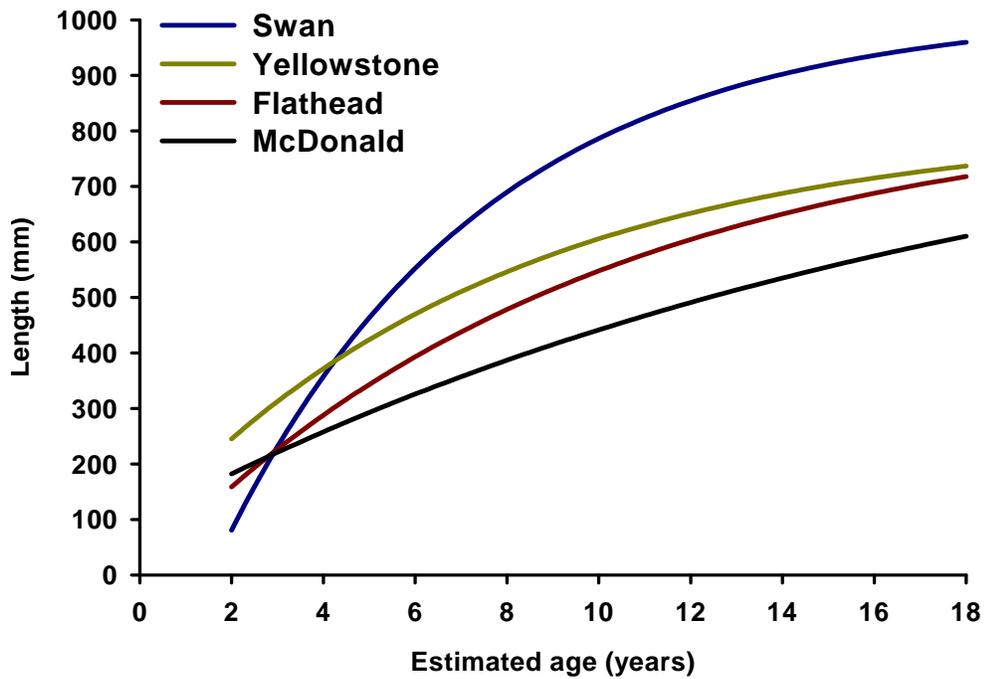


Figure 4. Growth rates of several lake trout populations throughout the Intermountain West. Swan Lake has the highest growth rate for 4 year old+ lake trout.

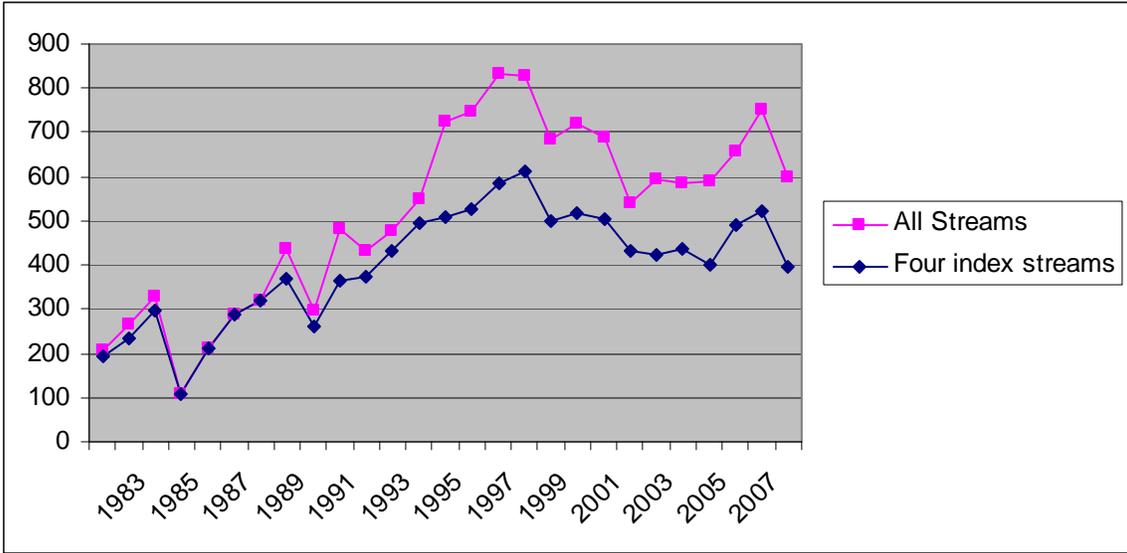


Figure 5. Total number of bull trout redds counted in Swan Lake spawning streams. Four key streams have been monitored every year. Other streams are monitored as funding and time permits.