Swan Lake Watershed Westslope Cutthroat Trout Restoration Strategy

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September 2010

Table of Contents:

Introduction and Background

The Swan Lake watershed is a magnificent aquatic ecosystem. The watershed contains numerous lakes, wetlands and streams, all associated with large groundwater supply, making the Swan Valley the wettest place in Montana. In most places the streams are clear and cold, making this ideal trout habitat. The Swan Lake watershed consists of approximately 93% public land and 7% private land. The headwaters of nearly every tributary originate from either designated wilderness or unroaded landscapes.

Native fish to the Swan Lake watershed include Westslope cutthroat trout (hereafter "cutthroat trout"), bull trout, mountain whitefish and other coldwater species. Prior to the 1940's, Westslope cutthroat trout were by far the most numerous and widespread fish species in the Swan. It is estimated that cutthroat trout previously occupied 500 miles of the stream habitat (Swan River and tributaries) plus Swan Lake, Lindbergh Lake, Holland Lake and 3-4 smaller connected lakes. Cutthroat trout moved freely around the Swan River valley and were well-adapted to handle periodic disturbances like wildfires or floods.

Things began to change when well-meaning biologists stocked brook trout and various *Oncorhynchus* species (rainbow trout, Yellowstone cutthroat trout, golden trout) in the Swan Lake watershed with the hopes of providing more diverse fishing opportunities. These non-native species quickly became invasive. Brook trout can exert much competition for scarce food resources in the tributary streams. Over time cutthroat trout retreated to the coldest headwaters and in some streams, disappeared altogether. Rainbow trout are fully established in the Swan River and they can spawn with cutthroat trout, resulting in hybrid progeny that continue to backcross with cutthroat trout, weakening the genetic purity further and further. At the same time many headwater mountain lakes, which were historically fishless, were stocked with Yellowstone cutthroat trout, golden trout or cutthroat trout of unclear parentage. These fish can also reduce genetic purity as they spill out of the headwater lakes and move downstream.

Other factors have also contributed to cutthroat trout decline. Early timber harvest and road construction practices have resulted in habitat loss and have undoubtedly contributed sediment that may still be impacting Swan Lake today. Land management practices have greatly improved since and fish habitat monitoring in tributary streams indicate that habitat conditions are once again in good condition. Initially, overfishing may have also caused a decline in cutthroat trout populations, but current fishing regulations are probably sufficient to protect cutthroat trout. Northern pike and lake trout are also present in Swan Lake and lower Swan River; but since cutthroat trout are scarce in these

areas, they probably do not have much impact. With all these limiting factors considered, today, the primary stresses to cutthroat trout are considered to be brook trout and other *Oncorhynchus* species (rainbow trout, Yellowstone trout, golden trout).

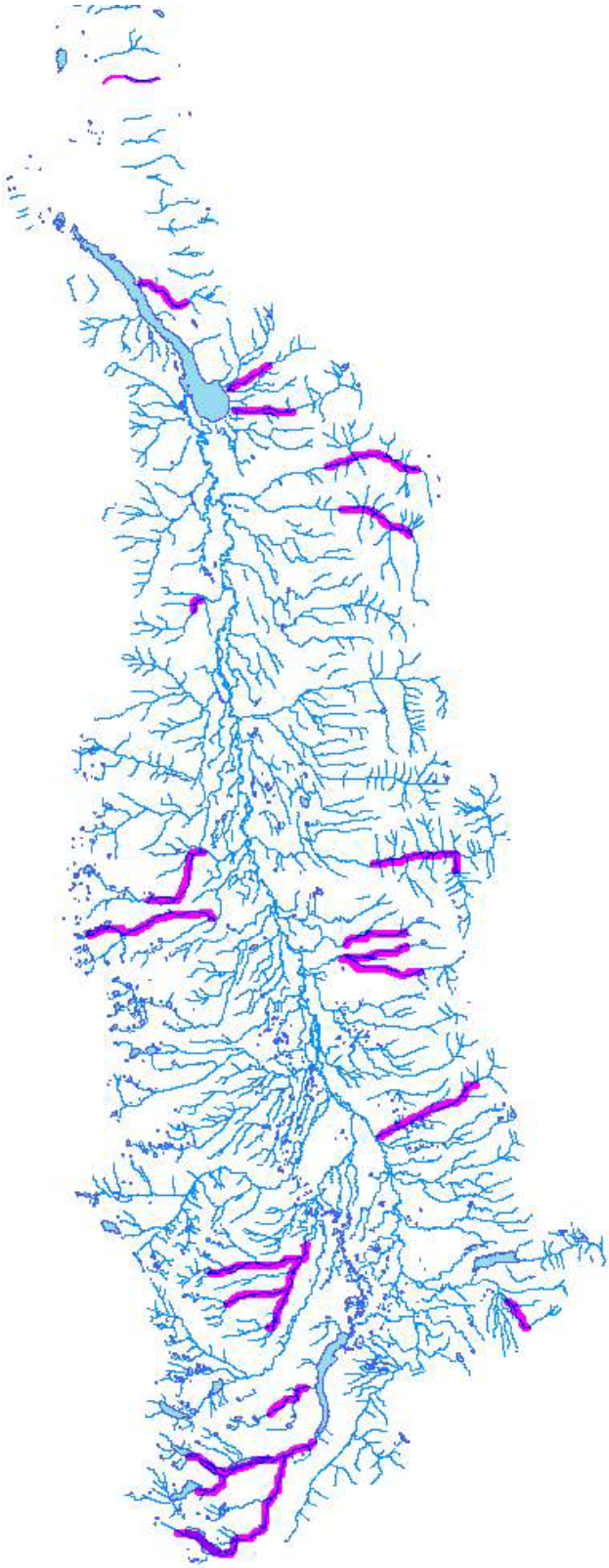
The decline of cutthroat trout in the Swan Lake watershed is typical across the range of the species. While the causes for decline vary from watershed to watershed, the species is now of "special concern" and has been periodically considered for listing for protection under the Endangered Species Act. In order to reverse the downward trend, multiple agencies and conservation groups in Montana signed a Memorandum of Understanding for conservation of cutthroat trout in 2007. This conservation strategy outlined five steps needed. First (1), all "conservation populations" would be maintained, secured or enhanced. Conservation populations are those that are still genetically pure, or are at least 90% pure and have unique ecological or behavioral adaptations. Second (2), the partners will continue to search for cutthroat trout and improve data on their status. Third (3), the partners will develop regional plans to expand the species within its historical range. Fourth (4), the partners will coordinate monitoring efforts. Finally (5), efforts will be made to increase public outreach, offer assistance to private landowners and improve technical research.

We believe that this Swan Lake watershed restoration strategy will achieve the goals defined above. We have identified several distinct conservation populations with security and/or enhancement needs outlined (1). This effort is a regional-based strategy to help expand cutthroat trout (3). We have begun an effort to gather more data on the current status of cutthroat trout in the Swan (2) and will share monitoring results (4). It is our hope that this report will help educate the public on the current situation (5) and it may generate new, creative ideas for the future.

Existing Condition

To the best of our knowledge, we believe that genetically pure cutthroat trout today are only thriving in about 20% of their historic stream habitat in the Swan Lake watershed (102 miles out of 500 miles historically). These populations are mostly small fragmented populations in headwater streams and are no longer considered one, large "metapopulation". Sadly, we believe that roughly 29% of historic habitat is now completely devoid of cutthroat trout. The remaining 51% of stream habitat still has some cutthroat trout but is either hybridized, scarce, or both. This information is based on compilation of all available data as of 2009. We know that there are data gaps and we understand that our reports may change as we gain new data. At this time, we are only focusing on stream populations because the status of lakes is even more difficult to assess.

Of those places where cutthroat trout are still thriving, we have identified 17 populations scattered across the Swan Lake watershed. These are "conservation populations" as articulated in the 2007 Memorandum of Understanding. These 17 conservation populations are illustrated on map below.



The 17 conservation populations vary widely in size and genetic purity. Some are thought to be fairly secure in that they are not yet invaded by non-native species. Others have imminent threats. Some populations may be too small or difficult to conserve and may ultimately be abandoned. It is also likely that new populations will be added as the partners gather more data. The following table provides information on the 17 conservation populations.

Table 1. Summary statistics of the Conservation Populations. Populations are listed geographically from North to South. Population data with ? following indicate numbers based on relative abundance work and have confidence intervals. Purity data with ? following indicate assumptions, no testing available.

Name	Length	Total Population	Purity	Threats
Wolf	3 miles	1,700?	95-99	Hybridization
Sixmile	3.1 miles	2,000?	100%?	None
Groom	2.9 miles	1,000?	100%?	Brook trout
Bond	2.7 miles	421?	100%?	Brook trout, hybridization
N F Lost	3.8 miles	807	100%	Brook trout
S F Lost	?	Unknown	100%	Brook trout
Whitetail	0.5 miles	75-300	100	Demographic or stochastic risks
Cedar	4.4 miles	5,570?	100	None
Lion	3.3 miles	Unknown	Unknown	None
Piper	4.9 miles	3,200?	Unknown	Brook trout
Pony	1.3 miles	1,092	99	Brook trout, hybridization
Dog	6.2 miles	2,100?	95-100	Brook trout, hybridization
Cooney	5.4 miles	Unknown	100	Brook trout, private land development
Kraft	11.9 miles	12,200	95-100	Brook trout, hybridization
Herrick Run	1.8 miles	290?	100	Demographic or stochastic risks
Owl	1.3 miles	147	100%?	Brook trout Demographic or stochastic risks
Lindbergh-Crystal	10.4 miles	1,100?	Unknown	Brook trout, hybridization

Potential Restoration Strategies

The following table itemizes the possible restoration actions needed for each conservation population. Actions are sorted by high, medium or low priorities based on urgency of the threat. No firm timeline is possible at this time due to unsecured funding. So little is known about some conservation populations that they "need evaluation" before strategies can be developed.

Table 2. Restoration Needs per Conservation Population.

Name	Restoration Actions	Priority
Wolf	Evaluate and secure barrier Private landowner agreement	Medium Low
Sixmile	Private landowner agreement	Low
Groom	Needs evaluation	Medium
Bond	Evaluate barrier feasibility Brook trout suppression	Low Low
N F Lost	Create secure barrier Suppress brook trout	Medium Low
S F Lost	Needs evaluation	Medium
Whitetail	Brook trout eradication immediately downstream Expand to additional tributaries	High Medium
Cedar	Evaluate and secure barrier Restoration of lakes, if needed Reduce risk of wildfire	Medium High Low
Lion	None needed	
Piper	Reduce risk of wildfire	Low
Pony	Needs evaluation	Medium
Dog	Needs evaluation	Medium
Cooney	Decision about Hwy 83 culvert Private landowner agreement	High Low
Kraft	Install barrier Suppress brook trout, if needed	High Medium
Herrick Run	Habitat restoration	Low
Owl	Secure barrier Eradicate brook trout	High High
Lindbergh-Crystal	Needs evaluation	Medium

Data Needs

The following table itemizes data needs that will help refine and improve this conservation strategy. It is hoped that an annual meeting between the partners will be held to share data collected and update future needs.

Table 3. List of Data needs for each Conservation Population.

Name	Data Needs	Priority
Wolf	Population Estimate Genetic Status Brook Trout Monitoring Fish status of headwater lakes	Low High Low Medium
Sixmile	Population Estimate	Low
Groom	Population Estimate Genetic Status Brook Trout Distribution	High High High
Bond	Population Estimate Genetic Status Brook trout Distribution Fish status of headwater lakes	Low Medium High Medium
N F Lost	Brook trout distribution Genetic Status Feasibility of creating barrier	High Medium Medium
S F Lost	Population estimate Brook trout distribution	Medium Low
Whitetail	Brook trout distribution nearby Feasibility of additional barriers	High Medium
Cedar	Population Estimate Brook trout distribution Fish status of headwater lakes	Medium Low High
Lion	Population Estimate Genetic Status Fish status of headwater lakes	Medium High Low
Piper	Population Estimate Genetic Status Fish status of headwater lakes Brook trout distribution	Medium High High Low
Pony	Brook trout distribution Fish status of Pony Lake	Low Medium
Dog	Population estimate Brook trout distribution Fish status of headwater lake	Medium High Low
Cooney	Population estimate Brook trout distribution	Medium Medium
Kraft	Pop estimate in Hemlock Ck Brook trout distribution Feasibility of barrier Fish status of headwater lakes	Medium High High Low
Herrick Run	Population estimate Fish status of headwater lakes	Medium High
Owl	Effectiveness of barrier Genetic status Brook trout distribution	High High High
Lindbergh-Crystal	Population distribution and size estimates Genetic status Brook and rainbow distribution Fish status of headwater lakes	High High Medium High