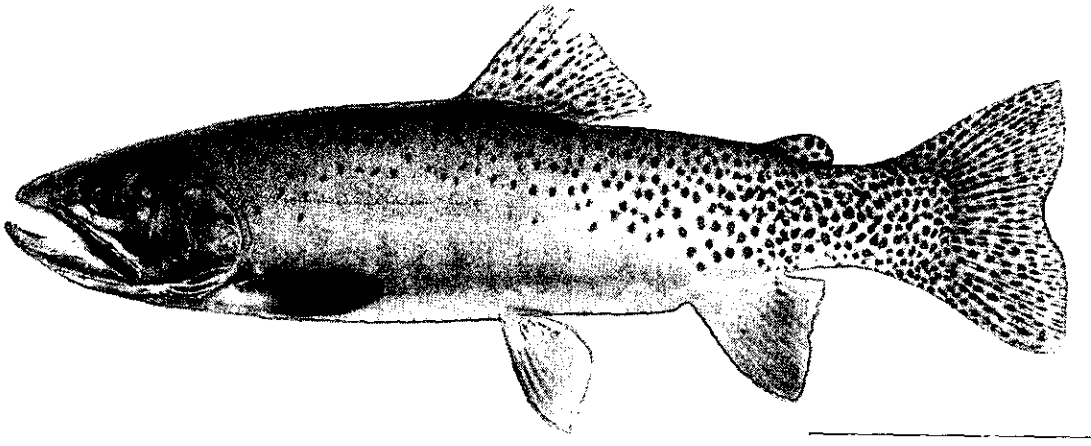
Progress Report for Big Hole, Red Rock, and Beaverhead Sub-basin Survey Work 2003



Karen –
this was not done with DJ (AFA) funding.
Karen Z.

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3/17/04

Introduction

In 2003, four streams were surveyed in the Big Hole sub-basin in order to complete the inventory of the sub-basin. Please see the previous progress report for more detailed information related to the Big Hole.

The Red Rock sub-basin survey was started in 2002 and completed in 2003. This included both electrofishing and habitat survey. The Red Rock sub-basin was the second sub-basin to be surveyed and is located in southwest Montana along the Montana/Idaho border with a land area of 1,481,853 acres. This sub-basin contains approximately 1,269.53 miles of perennial streams.

The Beaverhead sub-basin survey was started at the end of the 2003 field season. Electrofishing was the only type of survey done. This sub-basin is located between the Big Hole and Red Rock sub-basins. This sub-basin has a land area of 833,359 acres and approximately 717.4 miles of perennial streams.

The goal of these efforts was to determine the distribution and abundance of all fish species within the sub-basins. Westslope cutthroat trout, a species of Special Concern, was a primary focus of this effort. Purity, distribution, and potential for conservation and restoration are important components of the Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana (1999). The information gathered from these surveys will further the protection and conservation of this species and help reduce the potential for listing as a threatened and endangered species by the U.S. Fish and Wildlife Service.

Brad Shepard-FWP, Jim Brammer-USFS, Dick Oswald-FWP, David Browning-USFS, and Scott Lentz-USFS had previously collected fisheries data in these sub-basins. Their data will be combined with data collected in summer 2003 to create a more complete picture of the fisheries status in each sub-basin. The end result will be a sub-basin plan that is currently being analyzed and written. The sub-basin plans will replace this report as the most current and accurate data for each basin.

Methods

Streams were prioritized for sampling based on historic data. The available historic data was mapped using ArcMap, Access, and GIS generated base layers. Species presence and distribution were displayed to see which streams had previously been surveyed, how extensively they were surveyed, and streams that had not been surveyed. Genetic results from historic WCT sampling were examined. A twenty-five fish sample is needed to detect 1.0% hybridization with rainbow trout and 0.5% with Yellowstone cutthroat trout at the 95% confidence level using Paired Interspersed Nuclear Element Polymerase Chain Reaction (PINE-PCR) techniques (Leary). Many of the previous samples were only 10 fish as a result of the lethal allozyme techniques being used at that time. Previously sampled streams with 90%-100% pure WCT genetics results were priorities for follow up sampling for two reasons, 1.) to improve the genetic sample (collect 25 fish if possible) and 2.) to collect more detailed abundance and distribution information on the population. Recommendations from Dick Oswald, Jim Brammer and Brad Shepard were also used to set priorities based on their previous experience in these sub-basins.

The priority of streams for sampling was 1.) streams with known WCT populations (90%-100% purity), 2.) unsampled streams connected to or in close proximity to known WCT populations, 3.) streams not sampled to the head waters, and 4.) unsampled streams.

Once a stream was chosen for sampling, a map of the stream and surrounding area was created using GIS information and ArcMap software. Reaches to be surveyed were noted on the map with a Universal Trans Mercator (UTM) coordinate so crews could accurately locate them in the field. Meter posts were calculated for each stream to allow us to spatially link data as soon as the crews returned from the field (the mouth of the stream is meter post 0 and increases to the headwaters). The reaches were 100 m. long and located 1,000 m. apart beginning at the mouth and continuing to the headwaters of the stream. The only exception to this was private ownership located on the stream if we did not have permission to access it. Those reaches of stream were omitted from the sampling protocol. The field crews were instructed to move the reach up or downstream to avoid having a barrier or potential barrier to fish movement located within it. This allowed us to determine if barriers were keeping pure westslope cutthroat isolated from introgressed fish or non-natives. A multiple-pass depletion estimate was done only if 10 or more fish were collected in the first pass. This was done in order to improve sampling efficiency and confidence intervals of population estimates.

Three-man crews were used to complete electrofishing surveys of streams. The crews used Smith-Root 12B backpack electrofishing units. Sample reaches were measured with a metric hip chain and to increase capture efficiency and reduce the movement of fish out of the sample reach a block net was placed at the upper end of each sample reach. The crews collected an average wetted width for the section and noted general habitat conditions. These included Rosgen channel type, pool to riffle ratio, pool complexity, pool formative features, air temperature, water temperature, pH, conductivity, and impacts such as roads and grazing. Crews included a brief description of over-winter habitat, juvenile and fry habitat, and primary limiting factors for fish. They also collected UTM coordinates and meter posts for the upper and lower bounds of the reach. A photograph displaying the typical characteristics of the reach was taken for a visual reference.

When a multiple-pass depletion was done, fish from each pass were kept separate to allow for accurate calculations. If the capture efficiency was below 60% for two passes the field crews were instructed to do a third pass to improve the capture efficiency and the estimate. Fish that were collected were identified to species, measured (total length) in millimeters, weighed in grams, and examined for any physical abnormalities.

A small fin clip was collected from the anal fin of fish that resembled westslope cutthroat trout. The protocol for fin collection was 25 samples per stream. If the crew encountered a barrier or potential barrier to upstream fish movement 25 more fin clips were to be collected above the barrier. If crews were unable to get 25 fin clips, because of low numbers of fish, they collected as many as possible. The fin clips were individually preserved in 100% ethanol in a labeled vial. The label included the crew that collected the sample, stream name, date of collection, and the reach number that the sample was collected in. Using the reach location allows us to determine if there is introgression in one part of the stream and not another. Genetic samples were prioritized and sent to the Wild Trout and Salmon Genetics Lab at the University of Montana, in

Missoula Montana, for analysis. Prioritization of the samples was as follows: 1.) potentially new populations, 2.) results of previous samples, 3.) location of high mountain lakes that are stocked with rainbow or Yellowstone cutthroat trout, and 4.) number of samples collected. Sample sizes of less than 10 were not sent unless there was high likelihood of pure WCT.

The crews also looked for barriers to fish migration as they moved up the streams. When they found what they felt was a barrier or a potential barrier they noted a UTM location with the use of a Garmin eTrex GPS unit and estimated a meter post location. They also took a photograph, noted the type and height of barrier, depth of the plunge pool if one was present, and determined if any overflow channels existed. In areas that are important for WCT preservation and conservation these barriers will be verified by a biologist to determine if it is complete or partial and whether it is a short or long term barrier.

The data collected from all three sub-basins has been entered into an Access database and has been migrated into Oracle for storage. The new data was combined with historic data and used to create new GIS maps displaying reaches sampled, species presence and distribution, and barrier locations. Photos of barriers and stream reaches and a population report were hot-linked to the maps.

Results

Big Hole Sub-basin

From June through September 2003, the summer crews surveyed a total of 4 streams in the Big Hole sub-basin (Table 1). A total of 4.3 miles of stream were surveyed. Cutthroat were found in Woody Creek and occupied a total of 0.06 miles. Brook trout was the most abundant and only other species collected.

Table 1.

	Tributary to	Species Found
Pioneer Creek	Big Hole River	Brook Trout
Pioneer Creek Trib #1	Pioneer Creek	Brook Trout
Pioneer Creek, North Fork	Pioneer Creek	Brook Trout
Woody Creek	Warm Springs Creek	Brook Trout and Cutthroat Trout

Genetic results from fish collected in 2001 were received from the Wild Trout and Salmon Lab in Missoula, MT. The results are located in the Table 2. Seventeen streams had at least one reach that contained pure westslope cutthroat trout. The sample size for the pure reaches ranged from 2 to 27 fish. The purity of the reaches that contained less than pure westslope cutthroat in these 17 streams ranged from 72.8% to 98.8%. In the streams that had no reaches with pure fish the purity ranged from 6.7% to 99.6%. In all of the reaches that were less that pure, with the exception of Odell Creek (2), at least part of the introgression was rainbow trout genetics.

Table 2.

	Number of fish in the sample	%WCT	%YCT	%RBT
Bear Creek	8	100	0	0
Bobcat Creek	4	100	0	0
Bryant Creek	25	100	0	0
Cat Creek	6	96.9	0	3.1
Dicks Creek	20	94	1.3	4.7
Divide Creek South Fork	27	100	0	0
Divide Creek South Fork Unnamed Trib	23	99.6	0	0.4
Divide Creek South Fork of the North Fork (1)	21	96.82	0	3.18
Divide Creek South Fork of the North Fork (2)	9	95.25	0	4.75
Divide Creek South Fork of the North Fork (3)	21	100	0	0
Divide Creek South Fork of the North Fork (Unnamed Trib)	3	100	0	0
Effie Creek	24	12.9	84.4	2.7
Gold Creek	4	43.25	8.75	48
Halfway Creek (1)	8	96.7	0	3.3
Halfway Creek (2)	25	96.2	0	3.8
Happy Creek	10	44	12	44
Harriet Lou Creek	10	90.63	0	9.37
Jacobson Creek	16	76.2	12.6	11.2
Lacy Creek (1)	15	77	2.8	20.2
Lacy Creek (2)	5	100	0	0
Lambrecht Creek	25	97.3	0	2.7
Lost Horse Creek	25	6.7	65.4	27.9
Meadow Creek (1)	9	100	0	0
Meadow Creek (2)	16	99.2	0.8	0
Mono Creek (1)	16	72.8	10.3	16.9
Mono Creek (2)	25	98.8	0	1.2
Mono Creek (3)	2	100	0	0
Odell Creek (1)	7	97.53	0	2.47
Odell Creek (2)	18	91.7	8.3	0
Papoose Creek	21	100	0	0
Pattengail Creek	8	19.5	25.5	55
Rabbia Creek (1)	7	100	0	0
Rabbia Creek (2)	23	100	0	0
Reservoir Creek	14	89.97	0.9	9.13
Sand Creek	23	23.4	54.4	22.2
Sheldon Creek	7	90	0	10
Squaw Creek	7	100	0	0
Squaw Creek Trib	16	100	0	0
Swamp Creek	4	83.9	0	16.1
Trident Creek	9	100	0	0
Unnamed Creek #2	21	100	0	0
Warm Springs Creek East Fork	5	100	0	0
Warm Springs Creek East Fork of the West Fork	2	100	0	0
Wyman Creek	4	95.5	0	4.5
York Gulch	10	100	0	0

Red Rock Sub-basin

From June through September 2003, a total of 16 streams were surveyed in the Red Rock sub-basin (Table 3). Approximately 59.8 miles of stream were surveyed. Cutthroat trout were found to occupy a total of 73.8 miles in 36 different streams. Thirty-three streams were found to be fishless in the reaches that were surveyed. Five streams had no water and no sampling was done.

In addition to cutthroat trout, brook trout and mottled sculpin were collected in the Red Rock sub-basin. Brook trout was the most abundant species collected in this sub-basin.

Genetic results for the Red Rock sub-basin are currently being processed at the Wild Trout and Salmon Genetic Lab in Missoula Montana. These results will determine purity of the cutthroat populations and help to prioritize future conservation and restoration efforts as well as sport fishing management.

Table 3.

	Tributary to	Species Captured
Big Beaver Creek, East Fork	Big Beaver Creek	No Water
Big Beaver Creek, West Fork	Big Beaver Creek	Cutthroat Trout and Mottled Sculpin
Crooked Creek	Sage Creek	No Water
Crooked Run Creek	Junction Creek	Cutthroat Trout and Mottled Sculpin
Deep Creek	Junction Creek	No Fish Captured
Dutch Hollow Creek	Junction Creek	No Water
Little Sheep Creek	Red Rock River	Brook Trout and Cutthroat Trout
Little Sheep Creek, East Fork	Little Sheep Creek	Brook Trout
Little Sheep Creek, West Fork	Little Sheep Creek	Brook Trout and Cutthroat Trout
Little Sheep Creek, East Fork of the West Fork	Little Sheep Creek, West Fork	Brook Trout
Lower Deep Creek	Deep Creek	No Water
Sawmill Creek, Trib #3	Sawmill Creek	No Water
Sourdough Creek	Muddy Creek	Cutthroat Trout
Sourdough Creek, Trib #1	Sourdough Creek	No fish Captured
Sourdough Creek, Trib #2	Sourdough Creek	Cutthroat Trout
Swamp Creek	Middle Creek	Almost No Water

Beaverhead Sub-basin

In August and September 2003, 10 streams were sampled in the Beaverhead sub-basin (Table 4). A total of 17.4 miles of stream were surveyed. Cutthroat occupied a total of 0.62 miles in Alkali Creek, Dyce Creek, and East Fork of Dyce Creek. No fish

were collected in 3 of the streams and 1 stream had no water. Brook trout and mottled sculpin were the only other species captured.

Genetic results for the Beaverhead sub-basin will be sent to the Wild Trout and Salmon Genetic Lab in Missoula Montana for processing next year.

Table 4.

	Tributary to	Species Captured
Alkali Creek	Blacktail Deer Creek, East Fork	Cutthroat Trout and Mottled Sculpin
Crows Nest Creek	Blacktail Deer Creek, East Fork	No Fish Captured
Dry Gulch	Dyce Creek, East Fork	No Water
Dyce Creek	Grasshopper Creek	Brook Trout and Cutthroat Trout
Dyce Creek, East Fork	Dyce Creek	Brook Trout and Cutthroat Trout
Dyce Ceek , West Fork	Dyce Creek	Brook Trout
Indian Creek	Blacktail Deer Creek, East Fork	No Fish Captured
Rough Creek	Blacktail Deer Creek, East Fork	Brook Trout and Mottled Sculpin
Rough Creek Trib #1	Rough Creek	No Fish Captured
Taylor Creek	Grasshopper Creek	Brook Trout

Conclusion

Big Hole Sub-basin

In the Big Hole sub-basin, we were able to find new populations of cutthroat and verify that previously documented populations still in exist. Genetic results have shown how pure these populations are. Abundance and potential for conservation and restoration will allow us to prioritize projects and efforts to protect westslope cutthroat in this sub-basin. Initially there appears to be a great deal of potential to protect and expand current populations. There may also be potential to reintroduce westslope cutthroat into previously occupied range.

Red Rock Sub-basin

In the Red Rock sub-basin, the impacts of multiple drought years were apparent. Many streams had gone dry by the end of June and early July. As a result unknown populations of WCT may have been lost. Restriction of habitat as a result of drought was surely an added stress to existing populations of fish including westslope cutthroat trout. There appears to be potential for conservation and restoration of westslope cutthroat in at least a few streams in this sub-basin. Further data analysis and genetic results will give us a clear picture of where our opportunities lay.

Beaverhead Sub-basin

The Beaverhead sub-basin survey has just been started and it is too early to have strong results. The sub-basin is scheduled to be completed summer 2004.

Sub-basin Plans

Sub-basin plans are in progress for both the Big Hole and Red Rock. The Beaverhead will be written after the 2004 field season.

This report is preliminary and contains data that may be subject to change upon further analysis. A finalized version of the Big Hole, Red Rock, and Beaverhead Sub-basin Management Plans will follow and replace this report and the data contained in it.

KAREN,

THIS THE FINAL VERSION OF MY 2003 ANNUAL REPORT. I SENT A COPY OF THIS TO BRUCE AS WELL.

THANKS,

SCOTT