Fisheries Management

Project title: Cutthroat Trout Egg and Sperm Collection

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Objective: To successfully manage Montana's fisheries resources, we need to maintain our broodstocks with a wide genetic diversity. These broodstocks should mirror their wild ancestors as closely as possible. The original gametes for our Yellowstone cutthroat trout broodstock came from McBride Lake in Yellowstone National Park in 1969. The last time gametes were taken from the lake to supplement the broodstock was 1987. To once again infuse our broodstock with new genetic material, we want to again collect gametes from McBride Lake for three consecutive years beginning in 2001. Each year of the three year program would require eggs and sperm be taken from 15 females and 15 males. Fish would be sacrificed for health and genetic testing. Means of collecting the fish would be electro fishing.

Findings: With help from Dan Mahony and his crew, eggs were taken from a McBride Lake tributary. On June 7, 2001, the lake was reached on horseback and foot. The water temperature was 10°C in the inlet tributary. All the fish needed were electro fished and held in holding nets in the creek. Sperm was taken from the males in groups of three. Eggs were taken from three females at a time into a sieve. Eggs were then put into a bowl where the combined sperm from three males was added along with a .75% saline solution. After several minutes, the eggs were rinsed and placed into a bucket containing 25ppm iodine for disinfection during water hardening. After water hardening, the eggs were rinsed and put into a water cooler for the trip out. A total of 27 fish were sacrificed for health and genetic testing.

Eggs were taken from 12 females, two others were spent and one was green. Sperm was used from 15 males. A total of 11,629 eggs were taken. This was an average of 969 eggs per female. There were 401 eggs per ounce with a total of 29 ozs. Percent eye-up was 41%. Hatch was 90% leaving 4,267 fry. Dry Head Creek in the Pryor Mountains was planted with 1,000 of the fish when they reached 1.7 inches long. These were put in the creek to reestablish a population of pure Yellowstone cutthroat trout. The remaining fish are being held at Yellowstone River Trout Hatchery in Big Timber, MT, to infuse broodstock on station with new genetic material.

All health tests done on the fish taken from the tributary came back negative, as did health tests done on month-old fry that resulted from the eggs taken. Genetic testing has not yet been done.

Project title: Movements and Reproductive Ecology of Genetically Pure and Hybridized Westslope Cutthroat Trout *Onchorhynchus clarki lewisi* in the Fan Creek Drainage, Yellowstone National Park

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Objective: The objectives of this study are as follows: 1) Identify spawning locations and times of pure populations of westslope cutthroat trout in the North Fork of Fan Creek and introgressed populations in the remaining reaches of Fan Creek. 2) Determine if both resident and fluvial forms of pure westslope cutthroat trout exist in the North Fork of Fan Creek.

Findings: A total of 28 fish were implanted with telemetry tags and passive integrated transponder (PIT) tags in the main stem and North Fork of Fan Creek. These fish were tagged from May 16, 2001 to June 25, 2001. A total of 22 westslope cutthroat trout were tagged in the North Fork of Fan Creek and six rainbow trout-westslope cutthroat trout hybrids were tagged in the main stem of Fan Creek. These fish were tracked on a weekly basis beginning on June 15, 2001 and finishing in mid-September when the battery life of the tags ran their course. In addition, 116 fish were implanted with PIT tags only in the main stem and North Fork of Fan Creek. A weir was installed in the North Fork of Fan Creek near the confluence with the main stem on May 15, 2001. This bi-directional weir was equipped with two PIT tag antennae able to detect fish passage both upstream and downstream in the North Fork of Fan Creek. Information was stored into two solar-powered data loggers, which were downloaded into a computer once every two weeks. This weir was removed November 28, 2001 before ice formation. A total of 127 movements were recorded as fish passed through the weir.

Fall 2001: A total of 29 fish were implanted with telemetry and PIT tags in the main stem and North Fork of Fan Creek from September 14, 2001, to October 10, 2001. Eight westslope cutthroat trout, four hybrids, and one rainbow trout were tagged in the main stem of Fan Creek. A total of 17 westslope cutthroat trout were tagged in the North Fork of Fan Creek. These fish were tracked on a weekly basis until November and on a monthly basis beginning in December.

Project title: The Spatial and Temporal Spawning Distributions of Yellowstone Cutthroat and Rainbow Trout in the Upper Yellowstone River Drainage

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Objective: To determine where and when spawning occurs for Yellowstone cutthroat trout, rainbow trout, and hybrids of the two species in the Yellowstone River below Knoll's Falls (the most upriver area accessible to fish from this study). Radio telemetry is being used to describe the spawning patterns of the three study groups of fish.

Findings: A total of 25 fish (15 cutthroat, 5 rainbow, and 5 hybrids) had radio transmitters implanted on April 5, 2001, from the Yellowstone River at Corwin Springs (approximately 16 kilometers down river from the town of Gardiner). These fish were followed on a weekly basis from the time of implantation through mid-July. Spawning was documented in tributaries for nine fish, with eight of the fish using either Cedar or Mol Heron creeks adjacent to the Corwin Springs area. One cutthroat migrated upstream to spawn in Bear Creek, approximately 3.5 kilometers upriver from Gardiner. One spawning rainbow trout and three hybrids were documented in Mol Heron Creek from mid-April until late May. Spawning cutthroat trout were observed in Mol Heron, Cedar, and Bear creeks from early June until early July. In addition, 25 fish from the Yellowstone River near Mill Creek in the Paradise Valley were also implanted with radio transmitters. These fish migrated to spawn a considerable distance down river from Yellowstone National Park and are not reported on here.