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FISHERIES MANAGEMENT UPDATE
WEST YELLOWSTONE
COOPERATIVE FISHERIES PROGRAM

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As you can surely relate, it has been a very busy and hectic year. It's hard to believe that my family and I have been in West Yellowstone for close to two years now. Unfortunately, due to the ever expanding efforts of the fisheries program at the Hebgen Lake Ranger District, I have not been able to accomplish one goal that I feel is of primary importance. That goal is to keep you, the anglers that frequent waters of the West Yellowstone area, informed of our accomplishments, future projects, and status of fish populations in our area. Well, to use an overused cliché, better late than never.

The West Yellowstone Cooperative Fisheries Program is a unique concept for a federal or state area fisheries position. The recently created program is jointly funded through a cooperative agreement between the Montana Department of Fish, Wildlife and Parks and the U.S. Forest Service and assumes responsibility for fish habitat protection and enhancement as well as management of fish populations in lakes and streams within the Hebgen Lake Ranger District. As a jointly funded entity, it is important to realize that the program is accountable for the typical work load of a Forest Service Ranger District fisheries program in addition to that associated with a Montana State area fisheries biologist position.

The West Yellowstone Cooperative Fisheries Program is responsible for managing a rich fishery resource that is recognized world-wide. Increasing angling pressure on waters within the resource area such as the Madison and Gallatin rivers and Hebgen Lake necessitate a proactive, biologically-sound fisheries program. In addition, the continued success of the fishing industry in West Yellowstone, which is a significant contributor to the local economy, demands sustainable quality fishing. In essence, the abundant fisheries resource and its associated use by a world-wide audience of anglers deserve a high-profile, productive fisheries program.

Another unique aspect of the West Yellowstone Cooperative Fisheries Program is its opportunity to communicate to a geographically diverse array of anglers. As thousands of people travel to West Yellowstone annually to fish trout waters of the district and the surrounding area, we can provide them with educational services to complement the quality fishing. Fish habitat displays, fishing access maps, fish viewing sites, and publicly supported enhancement projects are examples of methods that could be used to educate anglers on fisheries conservation, management, and the related roles of the two cooperating agencies.

It's an exciting time for me as a fisheries biologist - heading up a program that is steadily building momentum, in an area having such a wealth of fish resources. The Hebgen Lake brown trout, unmatched in abundance in all of the reservoirs and lakes in Montana - the fall run of rainbows in the Madison River - the secluded experience of

fishing Quake Lake - this is truly a wonderful place to not only fish, but to work in the field of fisheries science. Time to get off the soap-box and down to the intent of this letter. The following summary highlights some of our major accomplishments, shortcomings, and future plans for the program.

Enhancement activities on Trapper Creek, a tributary to Hebgen Lake, continued this summer with approximately 5 yd^3 of gravel installed at log structures located above the Forest Service road culvert. All of the log structures installed in the summer of 1992 are still intact and functioning after relatively high spring flows. Adult fish were observed upstream of the culvert so it appears that the fish passage structure installed in the culvert last summer is functioning. Fish trapping this spring on Trapper Creek was canceled due to a mysterious closure of the road leading to the trap. The road was reopened, however, allowing us to complete enhancement work in the lower reach last October and to trap next spring. Enhancement of the lower reach entailed installation of several log and rock structures, and at two sites, placement of approximately 6 yd^3 of spawning gravel. The overall outcome of the project was an increase in available spawning habitat by an estimated 60 % based on stream habitat survey data.

This past summer we also completed construction of a 3 acre pond on the south side of Highway No. 287 adjacent to Beaver Creek under a cooperative agreement between the Montana Department of Fish, Wildlife and Parks, the Hebgen Lake Ranger District of the U.S. Forest Service, the Montana Department of Transportation, and the Montana Trout Foundation. We made several adjustments from the original proposal that resulted in a much bigger and deeper pond than initially anticipated. We also contracted a backhoe to construct an overflow/spawning channel. The newly created pond on the south side of the highway has a maximum depth of 13 feet. Areas of the two larger ponds on the north side of the highway were also dredged out to a depth of 6-7 ft to provide suitable overwinter conditions for fish. I proposed special regulations for all of the ponds next to Beaver Creek that were approved by the Fish and Game Commission. The new regulations will be posted next to the ponds, specifying a July 1 to November 30th season, artificial lures and flies only, with no harvest allowed. We will stock the new pond with wild-strain Desmet rainbows over the next three years. Be aware that the project site looks rough at present but should revegetate by the mid-summer. Details of the project are available in the Beaver Creek Wetlands Fish and Wildlife Habitat Enhancement Completion Report.

At the request of Craig Matthews, we captured 52 adult rainbow and brown trout that were stranded in a side-channel pool off the Madison River by the Slide Inn and transported them back to the river (see Jan/Feb issue of Fly Rod & Reel). Approximately 15-20 anglers assisted in the effort. Although this had little effect on the population in the Madison, the positive public relations that were gained made this a worthwhile effort.

For the past two years, we have electrofished three 1,000 ft sections on the Taylor Fork in the spring and again in the fall to look at age-specific mortality. By comparing abundance of different age groups in the spring to that in the fall we hope to estimate angling mortality (+ natural mortality) and by comparing fall abundance to that in the following spring, overwinter mortality. Unfortunately, numbers were so low this spring that this will be difficult to do. Numbers of catchable trout on the Taylor Fork ranged from a low of 5/1,000 ft in the Upper Meadow Section to a high of about 30/1,000 ft at

the Nine Quarter Circle Section. These low abundance levels of catchable fish suggest probably a combination of factors including:

- Inadequate recruitment possibly due to harvest of spawning adults in nursery streams
- Potential movement out of the basin into the Gallatin
- Overwinter mortality of age-0 fish.

Analysis of all the Taylor Fork data will be a high priority this winter to come up with a management plan for the drainage. Given the current population levels, it appears that angling mortality, however low it may be, should be considered unacceptable. As a result, it may be necessary to change current fishing regulations to push back the opening of fishing in the Taylor Fork Basin to protect spawning fish coupled with catch-and release only during the summer months. The success of adopting these or other protective regulations would be determined by what proportion of the total mortality is due to angling. Tom McMahon, associate professor in fisheries at MSU, has provided assistance in electroshocking efforts and is conducting research in the Taylor Fork and its tributary streams that will be invaluable in developing the fisheries management plan for the Basin.

We also completed enhancement work on Black Sands Spring, a tributary to the South Fork of the Madison. In our population work last summer, we found large groups of juvenile fish stacked under matts of algae and moss that were captured by fallen trees. In long sections of the channel, however, no woody debris was present and in these areas, we found no fish. To disperse and enhance these concentrations of young-of-the-year and age-1 fish, the Forest Service provided a blaster and explosives to dump approximately 18 trees in the barren section of the channel. We blasted the trees rather cut them with chain saws as stumps on the streambank would detract from the aesthetic quality of the pristine spring creek. As it turned out, the blasted trees mimic blow down, blending them in well with the surrounding environment. The scour created by these trees also provided additional spawning habitat that was well used this fall. KaBoom...

In late August-early September, fish were collected from upper Cabin, upper Tepee, upper Taylor Fork, and Tumbledown creeks and sent to the University of Montana fish genetics laboratory for analysis. To-date, we have collected fish samples from close to a hundred streams on the Gallatin National Forest and Yellowstone National Park in search for pure populations of Westslope Cutthroat trout, a species native to the area. Finally, we hit pay-dirt - the first pure population of Westslope Cutthroat in the Gallatin National Forest was found in upper Cabin Creek. Sampling will continue next summer to document the range and viability of this native, remnant population.

During the past summer, I also met with Lynda Caine, the new owner of the Watkins Creek property and a representative of the Nature Conservancy to discuss establishing a conservation easement on the property. This would allow the State and Forest Service to participate in a stream rehabilitation of lower Watkins Creek. It appears that we also need to contact the owners of the Firehole Ranch to gain their support as they own part of the lower riparian area. Stream survey data collected at both high and low flows, fry trapping, and adult spawning data indicate that a major rehabilitation project is necessary. As it currently stands, some spawning does occur in the lower reach of

Watkins Creek but fry production appears to be limited by egg mortality due to high levels of fine sediment.

Now for the big kicker - Hebgen Lake. Since my arrival in West Yellowstone in June of 1992, the fishery of Hebgen Lake has established itself as a top priority. Unfortunately, I don't have any sure-fire solution that will provide quality, year-round fishing on Hebgen Lake starting today. I can, however, ensure you that finding better ways to manage the fishery of Hebgen Lake will continue to get the attention it deserves.

The current focal point of management for the fishery of Hebgen Lake, initiated by the Montana Department of Fish, Wildlife and Parks in 1979, is to establish self-sustaining populations of wild trout. To obtain this management goal, the Department began stocking wild-strain trout in Hebgen Lake with the intent of establishing successful spawning runs that would, under natural conditions, exceed recruitment into the fishery previously maintained by stocking of domesticated fish. This change developed in response to the short life span of the domesticated strain of rainbow trout (*Oncorhynchus mykiss*) planted in Hebgen Lake prior to 1979 coupled with the lake's limited growth season. The poor survival and growth of the domesticated rainbow trout resulted in low angler catch rates (0-24 - 0.41 fish/hr) of fish having an average maximum total length of only 12.0 in. In addition, the domesticated rainbow trout did not establish significant spawning runs in any of the numerous tributaries of Hebgen Lake. During this time period, however, runs of brown trout (*Salmo trutta*) in tributaries such as Black Sands Spring, South Fork of the Madison, mainstem Madison, Duck Creek, etc., were very successful, reflecting the high quality of spawning conditions in these streams and the potential for establishing a self-sustaining population of wild rainbow trout. In addition, it was also anticipated that wild-strain rainbow trout would have a higher survival rate than the domesticated rainbows, resulting in increased angler catch rates of fish having a greater average maximum total length.

The wild trout management goal established in 1979 lead to the cessation of stocking domesticated hatchery rainbow trout (Figure 1). At that time, the Department switched to planting wild-strain Lake McBride Cutthroat trout (*O. clarki)*. The McBride cutthroat exhibited high survival and growth rates but unfortunately, did not effectively reproduce in tributaries of Hebgen Lake, as was the case with the domesticated rainbows. As a result, in the late 1980's the Department initiated a large-scale stocking program of Eagle Lake and DeSmet rainbow trout in Hebgen Lake, both of which are also wild-strain fish. The original stock of Eagle Lake rainbow is a piscivore obtained from Eagle Lake, California where it feeds primarily on lake chubs. The DeSmet rainbow stock is primarily a plankton feeder and was obtained from Lake DeSmet, Wyoming. The DeSmet strain has since been established in Willow Creek Reservoir located near Harrison, Montana which serves as the egg source for stocking in Hebgen Lake. From 1986 to present, several hundred thousand young-of-the-year Eagle Lake and DeSmet rainbows were stocked in Hebgen Lake with the intent of building wild populations that would reproduce naturally, thereby providing ample recruitment to sustain a productive fishery without the dependence and expense associated with annual stocking.

In 1994, Hebgen Lake is scheduled for stocking of approximately 50,0000 Eagle Lake and 50,000 DeSmet rainbow trout. The rationale behind the equal split of stocking these two wild stains of rainbow trout is that little information exists on which strain, if

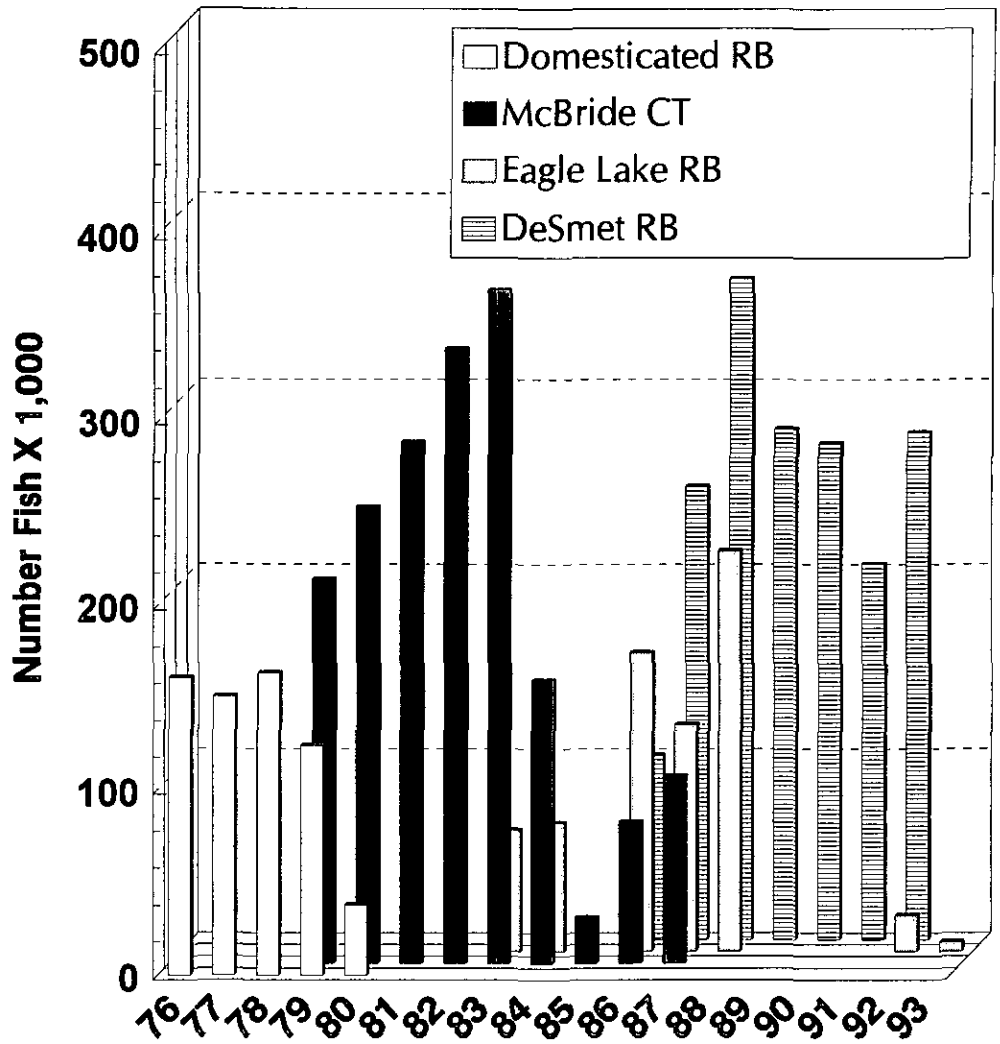

Figure 1. Quantities and strains of salmonids stocked in Hebgen Lake between 1976 and 1993.

either, is reproducing naturally and to what extent natural reproduction contributes to recruitment of the Hebgen Lake fishery. The South Fork of the Madison River Salmonid Escapement Study developed in response to this lack of data regarding natural reproduction of wild trout populations of Hebgen Lake.

As part of this study, we attempted to operate two subsampling traps in the South Fork of the Madison River this past fall, located ½ mile upstream from Hebgen Lake. In addition, a permanent adult fish trap was also installed and is still being maintained on Black Sands Spring that has a 100% capture rate. We ran into several obstacles, however, with the design of the traps and their ability to hold fish. After several modifications, we finally constructed an efficient fish trap for capturing upstream migrants and were able to document the brown trout run in Black Sands Spring. From Oct 1993 to Feb 1994, we passed over 1,500 adult brown trout through the Black Sands Spring Trap. Now that we have the problems worked out, we are hoping to continue the trapping study on the South Fork and Black Sands Spring in early spring to estimate the run of wild rainbow trout in the system. Details of the subsampling study design and statistical methods are available in a cost-share proposal submitted to the Federation of Fly Fishers in January, 1994. We are requesting dollars from the FFF to help pay for technician salary and equipment costs necessary to complete the study. This methodology was developed to provide us with information on what strain of wild trout in Hebgen Lake is reproducing naturally, how important that reproduction is in relation to the entire Hebgen Lake system, and how to increase natural reproduction of these wild fish. We developed this methodology to replace fry trap sampling which has high variability and often times resulted in mortality of the captured fry.

Another facet of the Hebgen Lake fishery that we are researching is the possibility of introducing a predator to utilize the Utah chubs. That was the idea behind introducing the Eagle Lake rainbow stock which is a fish eater in Eagle Lake, California. Unfortunately, the food-habits data we have collected indicate that the Eagle Lake fish are not utilizing the chubs. This also tends to be the rule with the brown trout. For example, we have collected brown trout in the lake that at 6 years of age are 22 inches with the rare exception of a 6 year old brown that approaches 20 pounds. So it appears that most of the browns are also not utilizing the chubs as a food-base. This is supported to a certain degree by stomach content analyses. If we were to find an effective predator that could decrease the chub population, this may result in decreased competition for the food-base shared by the wild rainbow trout and chubs as well as create a trophy fishery.

Other accomplishments over the last year and a half include giving presentations on the wild trout management program for Hebgen Lake to the local community, on stream enhancement at the FFF conclave in Livingston, and working with and talking to students at the West Yellowstone school. We have conducted electrofishing population surveys on several bodies of water including Hebgen and Quake Lake and several streams. I have also been very involved in reviewing and commenting on Forest Service timber sale and road closure proposals. In this regard, I feel fortunate to work with such an environmentally conscience group of individuals. The timber folks at the Hebgen Lake Ranger District represent the new generation and direction of the U.S. Forest Service. In conducting analyses necessary to comment on these plans, we have taken over 70 sediment cores from streams and surveyed over 20 miles of streams.

In this harsh time of dwindling state and federal budgets, I still have high expectations for the future of the West Yellowstone Cooperative Fisheries Program. I have been working hard to get a nonprofit foundation, the West Yellowstone Cooperative Fisheries Foundation, established to help support future projects in the West Yellowstone area. These special projects could be completed in addition to fish population monitoring, physical habitat assessments, and reviewing and making recommendations on Forest Service timber, road, and recreational activities. Examples of future special projects include:

- Land acquisitions and/or conservation easements
- Construction of a handicap access trail and fishing platforms on the Madison River
- Construction of a handicap boat ramp and fishing pier at Hebgen Lake
- Construction of a fish observatory on the South Fork of the Madison
- Watkins Creek stream rehabilitation
- Development of a spawning channel at Cory Springs
- Denny Creek stream rehabilitation
- Net pen rearing of wild-strain rainbow trout and viewing facility at Hebgen Lake
- Overwintering habitat enhancement on the Taylor Fork
- Genetic identification and enumeration of Hebgen Lake tributary spawning runs
- Development of interpretive displays at various streams and lakes
- A comprehensive survey of fish populations in high mountain lakes on the district

And the list could continue... As you can see, we have very high expectations for the success of the West Yellowstone Cooperative Fisheries Program. What I would like to see is involvement on your part. If you have any special projects, fish issues, or regulations of special concern, please feel free to contact me. You, as part of the fishing community of the West Yellowstone area, deserve to have the opportunity to be involved in the future of our program.

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