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Wilderness Area Fisheries *

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Eight years ago, my immediate supervisor informed me that we had 60,000 cutthroat trout allocated for the waters in the Beartooth and Absaroka Mountain Ranges. These are rugged, granite mountains with lots of lakes on timberless plateaus, glacial cirques and glacial scours. I took out the maps, interviewed old timers, talked with the game warden and had the fish distributed to several waters by airplane. These sparkling lakes occupied niches in the clouds between 7,000 and 11,200 feet. That decision bothered me but similar plants were made in following years just as they were done before me. I wondered whether the fish reached the designated waters, whether people would ever creel any of these fish or if I overstocked some lake. It never occurred to me that I was risking a pilots life or possibly wiping out a gene pool of a desirable fish species. It never occurred to me that native fish may occupy the drainage downstream and be detrimentally affected by fish or progeny of fish from my plant.

Eight years ago I surveyed 10 lakes outside the Primitive Areas with the aid of an experienced pilot and helicopter equipped with pontoons. Seven years ago I strapped on a backpack and by the end of this month, I will have sounded, netted and studied 1,000 lakes in what will soon be the Beartooth Wilderness Area.

During those seven years, techniques were refined, loads got heavier, bad weather became more tolerable, special studies developed, but most of all those uninterrupted nights around the fire convinced me how little we understood those aquatic environments in the high country.

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* Presented at annual meeting of American Fisheries Society 1975, Las Vegas, Nevada.

The primary purpose of Wilderness Areas is to maintain some original landscape unaltered by man. However, with only few exceptions, the fish existing in the back country I am familiar with were a result of man's efforts. These fisheries are not natural occurring phenomenons. Man has already altered the aquatic resources. Whether fish were originally distributed by a placer miner, trail builder or early Rod and Gun Club member, man is responsible. He did not plant with thoughts of the ultimate ability of specific waters to produce fish at full potential. His efforts were noble and are now part of our mountain heritage. If these hardy individuals had a total picture of the entire aquatic resource in these mountains, they could have like I should have 8 years ago, distributed fish with some logic regarding species, their selected environment and their ultimate influence in the area.

One of the most discussed aspects of mountain waters is productivity or lack of productivity. Mountain waters are characterized as poor producers due to all the features we assume limit productivity, like climatic and chemical limitations. They don't with exceptions, have the limiting influences caused by man-made pollution, habitat alteration, unnatural water level fluctuations or high turbidities common on valley floors. They have dynamic growing seasons and usually have excellent morphological features.

Professional fisheries scientists tend to compare mountain lakes with lakes occurring on the richer valley floors. Are they comparable? How many low-land lakes have grayling, goldens or self-sustaining populations of rainbow or cutthroat trout? Accumulated abuses of valley waters have probably placed greater limitations on trout productivity than the long winters create in Wilderness waters. Could it be that more trout of a greater variety can be cropped in the lakes in the clouds than from valley lakes? With continued deterioration of low land waters, the mountain waters may by our only future trout fisheries.

Winter kills occur in the mountains just as they do in low lands. Winter mortalities occur in two types of environments in the Beartooths. One type is in the typical shallow, vegetated, marginal lake where ice and snow densities limit light penetration. The other occurs in large, deep, low shoreline developement value lakes where heavy snowfall occurs. These large lakes form multiple ice-slush layers of 5 to 10 ft. and have 2 to 10 ft. of surface snow. If no permanent winter inflows exist, dissolved oxygen deficiencies develop in the 39.2°F bottom water. Fish are forced to occupy the upper strata and feed on smaller planktonic food organisms. Cutthroat in particular seem to suffer some mortality in these lakes.

Streams in the highest, most rugged real estate serve the lakes as nurseries and food sources, rarely do they have resident trout. Most streams leave the high country with rage and are uninhabitable by fish. In more productive, vegetated lower mountains, the streams often support trout, sometimes indigenous species.

The proposed Beartooth Wilderness has ± 1,000 lakes in the Montana portion. Rainbow, cutthroat, brook, golden and some brown trout as well as Arctic grayling and some trout crosses occupy various niches in these mountains. Thirty five percent of the lakes have fisheries. At least another 25% of the lakes presently barren of fish have conditions which would allow a fishery.

Graduated mesh gill nets 125 feet long by 5 feet deep capture from 2 to 225 trout per set. In 350 nets capturing fish, the average catch was 27 trout/net. The average weight was 20 pounds of trout/net. The most common species is the brook trout. Brookies occur in 13% of the lakes and are followed by cutthroat, rainbow, grayling and goldens.

The success of brook trout is largely attributed to their availability to early stockers, their ability to reproduce successfully in cold waters, their long incubation periods, early spring emergence and initial growth advantage. Brook trout are not capable of reproducing in every lake. They have limitations where unsuitable gravels and glacial silt do not allow reproduction. Historically it was these lakes that would not allow brookie reproduction that became famous for big fish. These were the lakes the outdoor publications reported. The majority of the fish populations in the highest lakes have limited spawning areas.

The required or desired spawning area among the various trout species is quite different. Arctic grayling tend to do best in small meandering meadow streams, goldens like the rising water temperatures of outlets whereas rainbow and cutts utilize inlets and to a limited extent, outlets. If errors were made with mountain lake management, it was with the lack of consideration of reproductive requirements of various fish species. Seldom were the right fish or race of fish used in the proper situation. We went strong toward utilizing one trout as our mountain fish. Many self-sustaining populations could have been established by using outlet spawners when outlets provided the best available spawning area, closed lake systems for brook trout, etc.

Growth rates of trout in mountain waters vary as they do elsewhere. The smallest fish are the brook trout with populations that stunt, suffer mortality and often comeback larger until they overpopulate again. There are 5 to 8 lakes which consistently produce brookies 1 to 5 pounds. The largest brook trout taken during the survey was 5½ pounds; the largest grayling, 2 ¼ pounds; golden, 6 pounds; rainbow, 5 pounds and cutthroat, 2½ pounds. One 8 pound brown trout was captured in a low elevation lake at 6,200 feet.

I've been following progress of several known age populations. Cutthroat were stocked in several virgin lakes. These fish underwent an initial growth bloom but by the 3rd and 4th years growth slowed and was not appreciably different from cutts stocked in non-virgin lakes or from lakes with sustaining populations. In no case has a cutt been found to exceed 18 inches. Golden trout and some rainbow populations have shown best growth rates with clearly distinguishable year classes. The oldest fish were known-aged golden trout occupying 3 different lakes. These goldens died-off after 14 winters.

I love the Wilderness concept. Its biggest drawback is the tendency of Wilderness to attract heavy recreational use. The challenge of managing Wilderness waters is exciting. I believe under the best management, mountain lakes will produce the best, most diversified, unique, quality and quantity fishing in the country. Of course as will be pointed out by the other panelists, the use of fish planting in managing lakes in dedicated Wilderness areas is limited by the Wilderness Act and implementing regulations. However, we have fewer constraints in primitive and back country areas. For the purpose of this discussion, let's assume we have a fairly free hand.

Because an area is a Wilderness or a Primitive Area doesn't mean fisheries managers should manage with primitive ideas. He should get in contact with the resource, gather the facts, up-date the pool of knowledge, investigate the winter scene. Management with maps, aerial photographs, unsatisfied anglers and mad game wardens is only a part of the effort. Where else does a fish manager have the opportunity to study waters without most of the man-made variables of agricultural, municipal, industrial pollution, habitat alteration, dewatering and have as much opportunity to influence use.

I believe that first a complete inventory is essential. I believe some of our aerial plants were errors. They often destroyed existing fisheries. Fish were often dumped in the wrong waters. I believe management should utilize the best stocks, often using successful mountain fish. I believe that lake morphology and potential spawning areas play an important role in selecting the race or species used. And if overuse from recreationalists exist, I believe the total fishery of a Wilderness can help alleviate deterioration by dispersing fishermen through-out an area. Fishing is a prime motivation for Wilderness users. Management should be geared to safeguarding rare and threatened species. It should attempt to achieve self-sustaining fisheries. Regulations should provide protection to vulnerable spawners and meet specific needs of individual waters as opposed to blanket regs over entire Wilderness regions.

I am not convinced every water needs a fishery. If at some future time a premium trout is found which excells in mountain waters, I hope we still have some barren lakes to put it in. And too, the invertebrates, plankton and other ~~forms of~~ organisms characteristic of barren lakes have purely scientific value that would dictate we leave some lakes fishless.

Recreational users of Wilderness tend to rely heavily on Fishing Guides, District Ranger Stations and correspondence to people like myself. These sources can and do influence distribution of use and it should be done with consideration to the entire area. I feel we can provide too much information to the backcountry user. Let the angler discover on his own a quality fishing experience. If fish managers provide a varied yet largely self-sustaining fishery, then a hands-off attitude, with the exception of one finger, can be applied to Wilderness Area waters.