THE HISTORICAL PERSPECTIVE

My first memories of the fisheries division began as a small child when my dad worked at the Emigrant Hatchery which at that time was located on the Pete Story ranch a mile south of Emigrant in the Yellowstone Valley. Some memories remain in my mind as if it were yesterday; going with my dad in a Model T truck loaded with cans of fish to plant in Dailey Lake. You didn't have to worry about aeration - between the rough road and a truck with those stiff springs the fish really were bounced around. Long distance fish distribution was done by the use of a renovated baggage car. The fish car was spotted on a siding. In the morning about 130 fish cans were filled with water, fish and ice at the hatchery. They were then loaded on a truck and hauled to the fish car in Emigrant. Later in the day in Livingston the fish car would be hooked onto either a west or east bound train. The fish were aereated by hand enroute to their destination. They were generally picked up by landowners and sportsmen at small towns, but sometimes the train stopped so they could be poured in the stream at stream crossings. Many thousands of brook trout, browns and rainbow were planted in this fashion. This explains why early fish plant records are sketchy.

Fish distribution equipment has improved over the years from fish cans, fish railroad cars and Model T trucks to gasoline and diesel powered vehicles with insulated tanks that allows us to transport fish across Montana with little change in water temperature. The aereation systems have improved greatly. In the 20's or early 30's a length of 3/4-inch galvanized pipe perforated with small holes, then wrapped tightly with a small tightly woven cord was used. An electric powered air compressor operating off the truck battery pumped air through the aereation system. This system had its problems such as if you lost power to the battery the air compressor soon ran out of electricity and the fish would die. Then came the gasoline engine and pump known as the recirculation system. After that the hydrolic aereator and then the present day system of bottled oxygen and fresh-flo aereators. Our present system is a good system for fish transportation and also for the drivers because of the alternate systems if one fails, we have back up systems to keep the fish alive.

Montana was divided into two regions that were known as the east and west sides. Emigrant was headquarters for the east and Anaconda for the west side. In the fall after all the fish were planted, Big Timber, Lewistown and Great Falls stations would be closed and all the employees would transfer to Emigrant to repair egg cases, vehicles and repair spawning equipment. In early spring some of the men would transfer to spawning stations and others would return to open up the hatcheries that were closed the fall before.

During World War II several million dollars of fish and game license funds accumulated. This led to the purchase of two new hatchery sites at Arlee and Bluewater and the renovation of most of the existing hatcheries to increase their capacity to rear larger fish. By the late 40's and through to the 60's the catchable program was in high

gear. The larger fish were released in practically every lake and stream. This was known as the "put and take" era. It soon became evident that these plants were very costly and had some adverse affect on the wild trout population. This program was phased out and most stream plants have been discontinued, however catchables now are being planted in some isolated areas. Since the mid-60's the hatcheries have been geared to the 4 to 6 inch fish for lakes and reservoirs.

I think one of the greatest breakthroughs in fish culture was the development of the dry diet over the red meats. This occurred during the late 50's. I have ground tons of horse meat, suckers, carp, tripe, beef liver, lungs, spleen and heart. Meats that were fed to small fish had to be ground 30 to 40 times through a 1/16-inch plate. It seemed we were always plagued with gill diseases. Conversions on the red meat diet was normally 5 to 10 pounds of food to produce a pound of fish flesh. With good fish culture practices dry food will produce a pound of fish flesh for every 1 to 1½ pounds of fish food.

Fish health work has become very important in fish culture. We can be very pleased with the advancements in the past two decades.

Without the assistance of our fish health biologist and the Fishery Resource Technical Center at Bozeman and the Disease Control Center at Fort Morgan, Colorado hatcheries would be plagued with many fish diseases that we were confronted with in early day fish culture. Furunculosis, kidney disease and bacterial gill disease were dreaded. Present day fish disease treatments are routine and fish are not stressed.

I would like to retrace my steps and mention several of the past disease treatments. I once witnessed a hatchery foremen pour a gallon of iodine in a pond of 50,000 4-inch coho salmon. As the iodine flushed through the pond the bottom of the pond was white with dead fish. That disease problem was cured in a hurry and permanently. Another hatchery disease was called the "two inch break". This seemed to be very common in cutthroat, it was probably nutritional or bacterial gill disease and caused by very fine particles of the ground meat. This too was generally treated with a salt bath. The fish would be crowded in the lower end of the raceway, the water would be shut off and an undetermined amount of salt would be poured over the fish. Most of the time the brine was strong enough to float the fish. The fresh water was then turned on, the dead fish were swept over the screen, the survivors did pretty well until the next treatment. Another very common treatment was "the truck treatment". As soon as there was some indications of sick fish the command was "Lets load up and get them to hell out of here." These treatments were done in good faith and it was assumed that most of the fish recovered when planted in an uncrowded lake. It was acceptable if you had large numbers of fish on hand to supply your planting request; for sure, this was survival of the fittest. With a fish health biologist to diagnose fish diseases we now treat non-infectious diseases and destroy fish that could infect an entire drainage.

We do have a very good fish health program and very good cooperation from the Fish and Wildlife Service.

Until 1955 or 1956 the only source of eggs we had were from wild spawning populations. Spawning sites were located at Georgetown Lake, Harrison Reservoir, Duck Creek, Main stem Madison River, South Fork of the Madison, Ackley Lake, Roger Lake, Lake Mary Ronan and several other locations. This was always some concern to the hatchery personnel as they had no idea how many eggs they were going to harvest. Some years there would be very low flows and the fish would not come into the traps. Many times a late storm would cause freezing temperatures and the ice would freeze up the racks and either tear them up or back up the stream and wash out around the traps. The greatest disadvantage to the spring spawning was that the fish had to be held over till the following spring or planted as small (2 to 4 inch) fish in the late fall when water temperatures were dropping and natural food sources were decreasing. Fall plants of small fish reduced growth and they had less chance to survive as these fish had to compete with the resident population. The undependable sources of wild eggs and late fall plants prompted the culturists to develop a fall spawning rainbow that could be planted as 4 to 6 inch fish in the spring. This fall spawning rainbow was developed in the mid 50's at the Arlee station under the supervision of Vern Campbell. This assured a better survival, also would allow the hatcheries a dependable egg supply.

We have begun to forget the failures we had with wild eggs such as the poor runs from year to year, the possibility of losing the traps from high water or ice, the additional cost of hiring watchmen, endless days of travel and spawning and the climax - planting 2, 3 or 4 inch fish in mid-October to mid-November just before freeze up.

Now today we are again focusing our attention on spring spawning fish and at the same time reviving the spring planting of catchables that we largely discarded some 20 to 25 years ago. Only this time instead of using fish from late November or December eggs which would be 5 inches by June, we are using spring eggs which require over wintering. Gary Shaver advises that in computing the cost difference, the main consideration is the size of fish to be planted. In other words a 5 inch Arlee rainbow costs the same as a 5 inch DeSmet rainbow no matter how long each is held in the hatchery. The kicker is, if you want to plant DeSmet in the spring after hatching, the smallest fish possible is 7 inches and a 7 inch fish costs 1.8 times as much as a 5 inch fish. I remember the words of Ivor Hoglund, an early day hatchery foremen. He said "If we stand still long enough we'll make 360 degree turn and be right back where we started", I am about ready to believe he was right.

Whether good or bad, brookstocks are the most dependable egg source we have. Egg harvest can be manipulated by the use of the photo-period to retard the spawning cycle. Genetic losses can be determined through the use of electrophoresis. Rearing the fish is also enhanced for after they hatch their development can be programmed to produce a certain size of fish at a preprogrammed date. This has been demonstrated at the Big Spring Trout Hatchery with the use of the hatchery constant.

The hatchery budget is getting very close to a million dollars a year. This means fish culture is expensive. We must get the best

use of every hatchery dollar and produce fish that meet the need - whether it be for developing spawning runs or for put-grow-catch fishing.

This brings me back to brood stocks, we know we can't hold fish in a hatchery without losing something. To put it simply, the truly wild fish can't stand domestication - they jump out of the trough or otherwise die. We have two approaches in broodstock management. Our McBride cutthroat program is an example of the first. Here we are trying to maintain the genetic makeup as close as possible to the wild fish. To accomplish this we have a complex process for selecting recruitment to the brood. Emphasis is on being unbiased - no selection of appealing color or large size; the only rejects are absolutely deformed fish. Then to re-instill wildness, with Yellowstone National Park's permission, periodically we return to McBride Lake to get some "new blood". We have plenty of testimonials from fish managers that says this program works. Our McBride plants meet high standards of growth, survival and ability to reproduce in the wild.

The second approach to broodstock management is more fraught with danger. Here we are experimenting with tailor-made fish. Can we design a better fish for the Deadman's Basins - large irrigation reservoirs with no trout spawning areas? This smacks of cattle-breeding and some biologists want no part of it. Our present plans are only for a very low key program, and only for use in strictly artificial habitats. We support the biologists efforts to establish natural reproduction wherever possible.

A still different approach involving broodstocks is the use of triploid fish. The procedure, involving the heat treatment of eggs, is easy but costly in terms of mortality. In our efforts we have lost 50 percent of the eggs. The first planting of triploid Arlee was in Bynum Reservoir in 1983. They were planted again in 1984. Triploids are scheduled for Noxon Reservoir in 1985. These are strictly experimental plants. Obviously this is a way to insure little or no reproduction, but will triploids live long and grow big?

To some extent we have become carried away with broodstocks and we are introducing several strains of rainbow in many of our waters at one time. I feel perhaps we should evaluate some of these strains before planting them in too many of our lakes and not make the same mistakes that were made in the past.

Since 1951 the hatcherymen and wardens have lost their role in being the fish manager. Beginning in the late 40's and early 50's the state of Montana began hiring fisheries biologists to survey fish populations and make recommendations for fish plants. Since then the biologists have had to wear many hats, doing 310 inspections, making fish population estimates and fishing regulation recommendations, fighting for stream flows through the courts and others too numerous to mention. While the biologists have been doing their job, the hatchery people have also done theirs, trying to produce the many strains and species of fish needed to meet management requests.

The decisions we make today will effect our fisheries of tomorrow just as they did in the past. Game Wardens, hatchery personnel and

local politicians dictated the management of state waters. I am confident that all of us have been critical of the practices of our past planting procedures. One instance I can remember very clearly was the Battle of the Little Blackfoot River. In 1946 Rod and Gun Clubs in Butte wanted the Fish and Game Department to plant brown trout in the Little Blackfoot River. The fisheries division took its stand and opposed the plant of brown trout in this stream. Browns had ample reproduction so it was like carrying coal to New Castle. Pressure finally overruled and brown trout were planted. This has happened many times throughout Montana in that our department has had to take second place and make fish plants where it effected a species of fish that was already doing very well in the stream.

I do have all the confidence in our fisheries division. Both hatcherymen and biologists have done an excellent job preserving the fishing of Montana.

I am sure the dedication to Montana's excellent fisheries will carry into the future.

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