



Creating the Nation's first BioPark

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Letter From the Desk of David Challinor
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Among freshwater anglers, especially in cooler parts of the temperate zone, trout and salmon have long been considered the ultimate fly fishing quarry. The initial popularity of recreational fishing is generally credited to Izaak Walton who published his Compleat Angler in 1653. He was a friend and London neighbor of John Donne, the cleric and poet with whom he often fished. In Walton's time anglers used long willow or birch wands as fishing poles and used worms and even small insects as bait. It was not until the late 1880's that the artificial fly was developed and used with an elegant long pole of split bamboo and a reel for the fishing line.

Until well into the 20th century fly fishing for trout and salmon was generally limited to those wealthy enough to travel to remote mountain streams and lakes for fishing vacations. The sport fishing industry blossomed in America, however, after WWII as increasing numbers of people became prosperous enough to indulge their passion for this activity.

By 1900 many citizens were already concerned about the damage done to heretofore pristine mountain streams by the mining industry. Thus in 1889 the first Colorado fish hatchery was built in Leadville to replenish the fish killed by leached acid from mine tailings. It is still fully operational, releasing hundreds of thousands of 8" long cutthroat trout into Colorado's mountain streams. This taxpayer-financed effort is considered politically well worth the effort as it supports the state's trout fishing business, now worth almost a billion dollars a year.

Trout were first raised artificially by a German farmer in 1733. He stripped the eggs and milt (male reproductive cells) from wild-caught brown trout and fertilized the eggs, raising the young trout that hatched. Since then trout hatcheries have proliferated globally in response to an almost insatiable demand from recreational fishers. We have all seen pictures of avid fishers standing almost shoulder to shoulder on the first day of the trout season along popular streams near major northeast cities. The fish that are caught have almost surely been only recently released from a local hatchery.



There is, however, a cost to the fishers' gratification and only recently have some citizens and especially state and federal hatchery officials realized that warnings sounded by scientists should be seriously considered. For example, raising vast numbers of trout in crowded conditions in concrete tanks is clearly at odds with the principle of "survival of the fittest" and produces uniform fish with little genetic diversity. The consequent genetic loss resulting from this practice might not be immediately significant, but when these homogeneous fish are released into natural streams, the ones that are not caught will soon outnumber the wild trout; the newcomers will then overwhelm the natives in the breeding population.

In the long run hatchery-raised fish cannot survive in the wild, and when they eventually disappear the native trout may no longer be around to replace them. For example, when a person walks beside a hatchery tank and casts a shadow on the water hatchery fish, instead of dispersing rapidly to protect themselves, congregate in the expectation of a food handout. Fishery biologists have learned that wild trout tend to stay in deep pools behind rocks, catching insects and other invertebrates as they are swept by with the current. Feeding in this manner both controls the amount of food consumed and conserves fish energy. Hatchery fish, on the other hand, tend to move rapidly about and recklessly expend energy. Their hyperactivity thus often displaces wild fish from their accustomed haunts.

Not only does the errant behavior of hatchery fish pose a risk to the well being of wild trout, but they also introduce disease into streams. For example, in 1987 whirling disease in trout was first noticed in Colorado stock. The affliction is caused by a parasite that makes the infected fish swim aimlessly in tight circles -- hence its name. It is hard to eliminate and may be now so well established that it is in the streams to stay for it is common in almost 700 miles of the state's trout streams and almost half of the state's trout hatcheries have tested positive for the presence of this disease. I gleaned these facts from an excellent article by Tom Kenworthy in The Washington Post (1 December 1996).

Despite the risk of disease and even the threat to the wild trout's survival, it is unlikely that Colorado will abandon its hatcheries. Sport fishers rely ever more on hatchery fish, and if catching such trout is less sporting (difficult) than hooking wild stock, who cares? Both kinds of fish seem to taste the same, although hatchery stock contain more fat. However, each year there are more anglers throughout the country who have never caught any but hatchery-raised fish; therefore, they have nothing against which to compare their fishing experience.

Although the scientific evidence continues to accumulate on the long-term alterations of stream ecology caused by the persistent release of hatchery stock, political pressure will doubtless continue to support this practice. Even when some Congressmen thought it more appropriate for fish hatcheries to be operated by the states rather than by the Federal Government, and introduced legislation to effect this transfer, Congress persisted in maintaining the federal role. Most conservation organizations argue in favor of state-run hatcheries because they feel that it is not the Federal Government's responsibility to run them. On the other hand, federal hatchery proponents argue that government intervention is justified to offset damage done to mountain streams by federally-subsidized mining, road building, logging, dam construction and myriad other environmental assaults.

If Colorado has its problems with release of hatchery trout, even greater issues have arisen in Washington State in its propagation and release of salmon. Washington probably has the most hatcheries of any state, releasing 300 million salmon and steelhead trout to benefit sport fishers and Native American fish netters. Nonetheless, runs of three major salmon species (chinook, sockeye and coho) keep dropping in total fish numbers. It is becoming increasingly clear that stocking alone cannot bring back the former multitude of wild salmon with which the state was blessed. However, current technology has made it relatively easy and profitable to raise salmon in pens.

Nowhere has the salmon industry been more successful than in Norway, where 330,000 tons of pen-raised salmon were produced in 1995. Meanwhile, as pen-raised fish continue to expand in number, the catch of wild Atlantic salmon has dropped precipitously in Norway from 14,000 tons in 1973 to 3,000 tons in 1995. Storms and boat collisions with floating pens allow on average about 1% or less of captive-raised salmon to escape each year. That does not sound like many fish, but 1/2 million pen-raised salmon are now free to interbreed with their wild congeners (same genus). Although the builders of fish pens are seeking better ways to prevent escape, and the government has stepped up inspection of commercial facilities to the same end, the industry is so large that unacceptable numbers of escaped fish continue to occupy the fjords. Norway accounts for half the world's production of Atlantic salmon, producing three times as much as Great Britain, its closest competitor.

The ultimate result of this huge uncontrolled population of commercially-raised salmon may easily be the eradication of wild fish -- at least in Norway. Wild salmon have an instinctive ability to relocate their natal stream when they return to spawn after years at sea. Farm-raised salmon, on the other hand, tend to swim up whatever stream is closest when they are ready to spawn. As cross-breeding with wild stock occurs, fishery

biologists worry that the genetic differences that allow individual populations of salmon to return to their natal streams will be bred out of them by hybridization. Furthermore, as in the case of hatchery trout in Colorado, these salmon carry parasites, which they introduce into the wild stock.

We all know that you cannot get something for nothing. Sadly, the hatcheries that were once welcomed to solve a seemingly intractable problem have become a problem in themselves as conditions have changed over time. Especially where animals are concerned, whether as pets, food, or objects to be either watched or hunted, human emotions hold sway. Objectives are frequently diametrically opposed and compromise is hard to achieve. It is only when threats to human health arise are control measures tolerated, as in the case of Lyme disease spread by white-tailed deer. Such conflicts will undoubtedly increase as humans proliferate and as more animal species learn to adapt to the ways of man. The end results will not necessarily make life better or worse, but we can predict with certainty that it will be different.

David Challinor
202/673-4705
202/673-4607 FAX