Managing Wild and Hatchery Fish in Oregon

A White Paper of the Oregon Chapter American Fisheries Society

(Approved by the Executive Committee on Dec. 13, 2000)

Issue Definition:

To reduce the risk of genetic and ecological effects on wild fish, excess returning hatchery fish are sacrificed in some rivers to prevent them from spawning in the wild. This practice has been criticized in the media and by other groups, largely on the basis that wild and hatchery fish of the same species are not substantially different. The position of the Oregon Chapter of the American Fisheries Society (the Oregon Chapter) is that the weight of scientific evidence shows that wild and hatchery fish can differ in many traits. In addition, hatchery fish spawning with wild fish may decrease the productivity and viability of their mixed progeny. Because of these differences, hatchery fish may pose both genetic and ecological risk to wild fish. These risks do not preclude a useful role for hatcheries in Oregon. We are simply noting that to minimize such risks, hatchery practices must be consistent with conserving genetic and life-history diversity and can be most effective when complemented by habitat protection and restoration measures.

Many of the scientific works on which this paper is based are listed in the attached "Reference" section. We intend for this paper on managing wild and hatchery fish in Oregon to evolve as new information is gained.

Differences Between Hatchery and Wild Fish:

Hatchery and wild fish can differ in many traits. Research has shown measurable differences between hatchery and wild fish in physiology, disease response, morphology, predator avoidance, genetic variability, competitive advantage, and fitness of mixed hatchery-wild progeny.

Characteristics of particular fish and fish populations, such as spawning time, age at maturity, disease tolerance, and growth potential have some genetic basis. The genetics of both the wild stock and the source stock for hatchery production are thus critical. Further, hatchery fish are the product of human selection of mates, and they are insulated from many natural selection factors during their incubation and early rearing life stages. Compared to fish living in the stream environment, hatchery fish are usually behaviorally conditioned to survive in densely crowded conditions with set feeding times and few if any predators. Wild fish are the progeny of mates that successfully spawned in natural habitats and have survived by finding suitable habitat, capturing enough food to grow, evading many types of natural predators, and enduring a highly variable natural environment. Simply put, hatchery environments select for characteristics that promote survival in a hatchery; stream environments select for traits that promote survival in the wild. Loss of natural variation resulting from hatchery influence can have significant effects on the ability of fish to survive or adapt to changing environments.

Direct genetic interactions between wild and hatchery fish have been demonstrated in many studies. Some studies provide evidence that hatchery fish do not perform as well as wild fish in natural streams and can decrease the productivity of the natural populations. Several reviews of Pacific Northwest hatchery programs clearly demonstrate the need for a new role of hatcheries, one where hatchery strategies emphasize conserving of existing genetic and life-history diversity in natural salmonid populations and complement habitat protection and restoration.

The Traditional and Changing Role of Hatcheries in Oregon:

The traditional role for hatcheries was to provide harvestable numbers of fish for commercial and sport fisheries, with little or no focus on conserving wild fish. Hatcheries either augmented or replaced over-harvested stocks of native fish or mitigated for lost habitat capacity. Unfortunately, the past 50 years have shown that the introduction of millions of hatchery fish has not offset losses to wild salmonid populations. Such populations continue to decline and traditionally operated hatcheries may in fact have contributed to the decline of wild fish in many rivers.

The Oregon Chapter believes that sufficient scientific evidence exists to show that hatcheries, with important changes from traditional fisheries management, may aid in protecting and restoring wild fish populations while habitat and harvest problems are being corrected. Oregon, Federal, and Tribal governments are establishing and implementing "Restoration and Conservation Hatchery" programs. The Oregon Chapter hopes these hatchery programs will help in recovery and restoration of wild fish stocks where they have been sharply diminished or eliminated. As with any management action, monitoring and evaluating results are essential to assessing the efficacy of the action taken.

Necessary Management Methods To Protect and Enhance Wild Fish:

Currently, Oregon has administrative rules requiring wild fish, including populations and stocks, to be conserved. Many of Oregon's hatchery activities are changing to incorporate the latest techniques on maintaining genetic variability, and some results are promising. Inappropriately selected hatchery stocks, however, will not assist in the recovery of wild fish; instead, they will work against that goal. If the perpetuation of certain hatchery fish, stocks, or both are deemed incompatible with conserving wild fish, the Oregon Chapter supports their scientifically based termination. The decision to kill excess hatchery fish or terminate a hatchery stock in any given case should be made through an open, deliberative process that uses the best available scientific input and in full consideration given to the context of the guiding public document (such as a Recovery Plan, Hatchery and Genetic Management Plan, or ODFW Basin Management Plan).

Conclusion:

The weight of scientific evidence on the interactions of wild and hatchery fish indicates that substantial differences exist between hatchery and wild fish of the same species and that these differences can negatively affect wild fish populations. The Oregon Chapter also recognizes that sufficient evidence exists that hatcheries may play a role in wild fish recovery and restoration efforts. Finally, we also recognize that hatcheries may be managed as part of a general effort to conserve population structure, re-introduce populations to recovered habitat, and continue to provide tribal, sport, and commercial fisheries. To accomplish these benefits of hatchery programs, the Oregon Chapter has concluded that the risks of hatchery practices must also be addressed. This conclusion means that hatchery practices need to be consistent with conserving existing genetic and life-history diversity and should be carried out in full coordination with complementary measures to protect and restore fish habitat. The Oregon Chapter is committed to helping facilitate this change through outreach and professional dialogue, and by both direct participation in and support of continued research on this topic.

The Oregon Chapter of the American Fisheries Society (AFS) is a volunteer organization of professionals in fisheries and aquatic sciences. We have more than 500 members in Oregon, drawn from Federal, State, and Tribal agencies, higher education, and diverse private employers. Among the goals and objectives of our society are providing scientific information on fisheries issues that will aid in the public discourse on natural resource management in our state.

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