

PROBLEMS OF MANAGING  
FOR  
SUSTAINABILITY OF  
NATIVE, WILD POPULATIONS

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Ultimately, what drives our success and satisfaction as anglers is **REPRODUCTIVE SUCCESS** of the fish. The strength, health and productivity of our fisheries depend on it.

There are two factors that affect reproductive success we have some control over. These are the way we protect and conserve native, wild populations and the habitats that support them. However, the impact of management on native fish has impoverished reproductive fitness of populations in watersheds and degraded the habitats that sustain and support this reproductive fitness. Both impacts have to be addressed effectively in order to maintain the inherent reproductive success of salmon, steelhead, trout and other native fish species.

There are several factors that must be addressed by any effective fish management program. These are spawner abundance, life history and genetic diversity, distribution, and productivity. A major question is whether we have the management policy and management actions to effectively address these building blocks for native, wild salmonid sustainability.

Effective fish habitat management must protect the productive capacity of the habitat to support the life history requirements of the fish throughout their life cycle. Both state and federal natural resource agencies are structured so that there is no cohesive ecosystem management. Therefore the health of fish populations and their habitats is an unrealizable goal. Sea-run salmonids are more difficult to protect than resident species because their life history requirements are spread over a large range from headwater streams to and including the ocean. On their migration they span many jurisdictions including international consumptive fisheries.

Sea-run fish integrate all these fish and habitat agencies, but the agencies do a relatively poor job of effective management. A fish conservation group has a complex and difficult task because it must address policy development and application among all natural resource agencies. It is an impossible task, so conservation groups have specialized and work cooperatively on joint issues. In Oregon we have organized a monthly meeting of conservation groups so that we are working together and coordinated.

An additional and vital ingredient, of course, is an informed community that is willing to make sure the conservation policies are in place and carried out. Within that community, the angler is the primary interest group for fish management. It is up to anglers to advocate for proper management by state and federal natural resource agencies. But to be effective anglers must be informed, organized, and politically engaged. The donations they make to groups like the Native Fish Society are used to develop sound policy and to

make sure that policy is applied on the ground. Grants typically are not available to do advocacy work. Grants help to fund projects, but they do not fund the mission of the organization.

#### ASSESSMENT OF THE SALMONID MANAGEMENT SITUATION:

We do not have the policy and management structure in place to maintain the productivity of native, wild salmonid populations and the habitats that support their sustainability over time. This will always be the case because government is organized to provide consumptive benefits to constituent groups, creating a conflict between conservation and delivering benefits to the groups they serve.

The primary focus of fish agency policy and management is on production rather than on productivity, and this focus has dominated fish management for 150 years in the Northwest.

The simple management model used for 150 years is one of artificially rearing salmonids, releasing them into rivers and regulating their kill in various competitive fisheries. This simple management model is an extension of an agricultural model that assumes nature is wasteful and inefficient, but can be perfected. It is also based on the industrial model that asserts nature's inefficiencies can be corrected and improved with technology. Wild salmon have a long history of being treated as a management problem for they do not conform to the dominant models of natural resource management. Therefore, it was only after salmonids were listed under the Endangered Species Act that wild, native populations were given legal protection and were elevated to importance among fish management agencies.

We still do not have a management model that is based on maintaining the natural productivity of rivers and locally adapted wild salmonids. This means important attributes of the natural ecological system such as evolutionary adaptiveness, natural cycles of climate and ocean productivity, nutrient enrichment from abundant spawners, spatial structure, life history and genetic diversity, distribution, and productivity of native populations are poorly incorporated into management and policy. These factors are beginning to be acknowledged but are not effectively applied.

The ESA has helped to re-focus fish management and policy so that factors important to maintaining and protecting the productivity of native, wild salmonid populations and their habitats are required by law. However, implementation is affected by historical assumptions and well established practices and legal agreements so the ESA is reshaped and largely rendered ineffective as a tool to protect salmonids and provide for their recovery. Some examples are a hatchery policy that claims hatchery and wild salmonids are the same, a harvest policy that allows incidental kill of ESA-listed fish, and reductions in critical habitat.

## HABITAT SUSTAINS THE PRODUCTIVITY OF SALMON

Habitat sustains salmonid productivity and affects life history and genetic diversity as the fish adapt to the constantly changing ecological conditions they are confronted by in freshwater and in estuaries and ocean. As they adapt to their home stream habitats, each salmonid population diverges into locally adapted breeding populations. They are adapted to both long and short-term changes affecting survival and productivity over their 40 million years of evolution. Native, wild salmonids have evolved to adapt rapidly to changing ecological conditions. Recent hatchery evaluation has pointed out that salmonids have the ability to change in the first generation during exposure to a different spawning and rearing environment. Those changes affect survival and productivity in one generation.

Habitat supporting native, wild salmon and trout is complex and interactive. We know that warm water temperatures limit salmonid productivity. We also know that fine sediments in the spawning gravel have a negative effect on egg and fry survival. We know that large trees falling into streams trap gravel and nutrients, create deep water and cover, and that toxins from our industrial economy can have negative effects on salmonid productivity as well as cause a whole run to go extinct.

State and federal government is not organized to maintain the habitat attributes wild native salmonids require. People and corporations are in competition with salmon for their historical habitats and government agencies are structured to be responsive to the interests of the constituents they serve. For example, the department of forestry is not organized to maintain the productivity of salmonid habitats; it is organized to respond to public pressure coming largely from private logging interests. This same problem exists in all natural resource management agencies. Consequently, the state and federal agencies have a built in conflict of interest and are unable to maintain habitat productivity for native salmonids or effectively recover damaged habitats for ESA-listed salmonids. Given this problem, the state agencies are not organized to replace the ESA or even effectively manage a population if it were no longer listed as a federal protected species.

## HATCHERIES: THE FAILED PROMISE

The dominate response we have used to respond to wild salmonids depleted by our fisheries and habitat alterations is the hatchery. The hatchery promise is to enhance salmonid production for fisheries due to habitat damage and overfishing. The first hatchery in Oregon was built in 1878 by the Columbia River cannery owners in response to the declining salmon runs. The hatchery would simply increase the supply of salmon for their business interests and they would have the added benefit of escaping state regulation of their fisheries.

There are many problems with hatcheries and they have been identified as a contributing factor in salmon decline. While these problems are serious and interactive, they have been well described, so for now it is sufficient to say that the cumulative effect of

hatcheries has been to degrade the reproductive fitness of wild, native salmonids as well as of hatchery fish. This of course creates an interesting feedback loop used to justify the construction and funding of more hatcheries.

The hatchery is a technological solution to ecological problems and they are a failure because their promise of boosting the supply of salmonids has not been kept. Since the 1850s we have funded over 200 hatchery programs in the Columbia River Basin yet the salmon abundance has declined by over 8 million fish and the wild, native salmonids are less than 5% of their historic production.

The hatchery idea owes its justification to the industrial model that tells us we can replace wild rivers and wild salmonids with hatchery fish, have productive fisheries and at the same time all the benefits of watershed development for economic gain. Hatcheries are an expensive political wink. They are the major source of public funds to fish agencies and they provide politicians with cover so that habitat degradation can continue. Hatcheries have been used to compensate for habitat loss and they have promised to sustain the fisheries.

This deception has a long history and is still being used. Jim Lichatowich in his book *Salmon Without Rivers* documents the self-defeating faith we have invested in hatchery technology. Hatcheries are not a solution for fixing declining salmon runs. Hatchery fish cannot be used to recover and sustain wild, native salmonids.

Research studies have pointed out that hatchery fish diverge in traits important to their survival even when they are derived from wild parents. Hatcheries promote traits that do not favor survival in nature. This can be controlled better than it is, but it cannot be eliminated. When hatchery fish spawn naturally with wild fish they have several undeniable impacts. When they interbreed with wild fish the progeny do not survive as well as the wild form. Hatchery fish also create competition for food and space so the habitat cannot produce as many wild fish as it could without hatchery fish. Wild fish conservation is important because they contain the genetic and life history diversity needed by the hatchery program to reboot hatchery fish survival and productivity.

#### MANAGEMENT POLICY RESISTS SCIENCE:

If you ever have a question about a management program or policy ask the proponent to explain the scientific basis for it. If there is one, is it adequate? One of the major impediments to improving conservation management of wild, native salmonids and devising ways to recover ESA-listed populations is the inherent resistance management has toward science. Science is like wild fish conservation for they both create management problems. A strong collaborative research program is vital to improvement of management, for it solves problems and develops insights that can be tested. But scientific research is poorly incorporated into fish management decisions primarily because managers are not accountable for decisions they make. Here is an example: Fish management agencies decided to harvest coho salmon at a 90% rate in the Columbia River in order to take advantage of the large number of hatchery fish. This action drove

all but two natural populations into extinction, ultimately causing a federal ESA-listing of the few wild coho that remained. This took place 15 years after the coho were initially petitioned for protection.

The result of this harvest policy, designed to benefit the fisheries, has been a restriction on harvest. Fishermen are paying a price even though fish managers have not. When a commercial fisherman loses his boat because he cannot fish and make his payments or a community is impoverished because of the poor fishery, state fish managers are never held accountable. It is not illegal to deplete a fishery by management. The managers still get paid and they get their retirement.

If the managers had listened to the assessment of their own scientists that were documenting the annual decline in coho salmon production in tributaries, they could have made a different decision. But they didn't. What they did do, however, fit perfectly into the industrial model for salmon management. They decided to release hatchery coho into the tributaries rather than manage the fisheries to provide a sustaining abundance of wild spawners. When the whole system crashed, and coho were listed, the angry fishermen went to court to defeat the Endangered Species Act and the state managers continue to collect their paychecks. This is how dysfunctional fishery management is today, but if scientists were listened to, a different result could have been realized.

It is because fish management institutions are not accountable for the decisions they make that they can continue to ignore science in policy and management. Even though the region has invested in an independent scientific assessment at the state and federal level, managers routinely ignore the scientific advice when it does not agree with their point of view.

#### ADVOCATES AND THE SOLUTION:

Anglers have a lot at stake. The future of their fishery is at risk. Fish abundance is a mere shadow of what it was and what remains is dominated by degraded habitat and hatchery production. Money is needed to support hatchery production and there is a lot of competition for the available dollars by other interests and programs. Any fishery dependent on hatchery production is at risk. And that risk becomes even more profound when legislators discover that hatchery fish often cost more to produce than the benefits they provide

Anglers are a subculture, a small subculture, and they are typically poorly organized, contentious, independent souls that would rather be on the water than in a commission hearing. They can be very effective and have made important changes for the good of their fisheries, but the message is that they could be even more effective.

There tends to be a well-developed lethargy among most anglers. They have accepted poor fishing and rivers with impoverished numbers of salmon, steelhead and trout. They fish around the edges of a well organized advocacy by commercial interests in fish habitat and fisheries and do not seem to notice. There are some that are organized to

oppose conservation management and rely on hatcheries for a supply of fish. Fish agencies cultivate these groups because they provide political support for their hatchery funding. Groups that are organized for conservation management of wild, native fish are a growing influence in fish management, but they are treated with suspicion by both the agencies and the hatchery advocates.

To be effective advocates for conservation management of native, wild fish anglers need to organize, develop a mission to protect and restore fish and habitat, develop the technical ability to fight for the cause, resist temptations to squander their credibility, and find the funding to support their important work. The following points were developed as comments to the Washington Department of Fish and Wildlife Steelhead Plan and will help you organize a conservation program. It seems simple, but implementing it is the difficult part.

#### MAGEMENT FOR WILD SALMONIDS:

- 1.) **Fitness, Health and Recovery:** Since wild steelhead are locally adapted each watershed should be managed to maintain the reproductive fitness of locally adapted wild steelhead. To initiate this objective, identify the genetic and life history characteristics of each stock in each watershed, recognizing that steelhead may have a subpopulation structure and management ought to be structured to maintain the reproductive success and integrity of these stock complexes. Also, the historical abundance of wild steelhead in a watershed should be determined based an assessment of the historical record, and the goals to recover wild steelhead ought to include historic abundance, diversity, productivity and distribution. Otherwise we are trapped in a constantly moving baseline that fails to place wild steelhead recovery in an historical context.
- 2.) **Measurable Biological Objectives:** Adopt measurable biological objectives that conserve the biological characteristics of wild steelhead in each watershed. These biological objectives would manage for abundance, diversity, productivity and spatial distribution for each stock. The purpose of these objectives is to maintain the biological diversity of each wild population and address life cycle reproductive fitness and survival.
- 3.) **Recover and Maintain Biological Diversity:** Develop management plans to maintain the biological diversity for each wild, native steelhead population in each watershed and across all state waters where wild steelhead are found.
- 4.) **Conservation Audit:** Establish an independent conservation audit that reviews management and management proposals to determine whether biological objectives are being achieved, identify research needs, identify critical uncertainties to be resolved, recommend policy and management changes to improve performance of the management program, identify adaptive management opportunities, and provide reports for the commission and the public.
- 5.) **Live Release Fisheries:** Until a wild steelhead population is determined to be healthy, based on the process above, fisheries ought to be managed for live release of all wild steelhead.
- 6.) **Ecosystem Nutrient Enrichment:** Determine the nutrient enrichment requirement for each watershed and manage all fisheries to accomplish a nutrient enrichment standard for each watershed, recognizing that coho and spring chinook provide the greatest benefit to wild, native steelhead stocks because they distribute nutrients into the upstream reaches of the watershed.

7.) **Protect Kelts:** Steelhead repeat spawners are an important life history attribute of native, wild steelhead and fisheries ought to be managed to protect steelhead kelts. In addition, passage at obstructions in rivers ought to afford effective passage for steelhead kelts.

8.) **Conservation Requirement:** Develop for each wild, native steelhead population a conservation requirement patterned after that used to protect wild Atlantic salmon in eastern Canada. The conservation requirement is based on egg deposition to fully seed the habitat and the adult abundance to provide the egg supply. The criteria used in Canada is 240 eggs per 100 m<sup>2</sup>, but primary research would have to be completed for steelhead to determine the conservation requirement.

9.) **Stock Transfer Policy:** Adopt a stock transfer policy that eliminates the transfer of hatchery or wild fish from one watershed to another unless there is a scientific risk analysis and the commission approves the transfer in a public hearing.

10.) **Manage Stray Rates of Hatchery Steelhead:** Manage all hatchery steelhead programs for a 2% stray rate or less affecting natural spawning areas used by native, wild steelhead in order to maintain the reproductive fitness of wild steelhead stocks. This would apply to all hatchery programs, both segregated and integrated programs, and would also control stray rates into adjacent watersheds.

11.) **Hatchery Risk Assessment:** All hatchery programs ought to have a risk assessment certification that determines the hatchery program does not harm wild, native steelhead including the fisheries that are targeting hatchery-origin fish.

It is important to remember that fish management agencies have their biases, and it is difficult to create institutional change. These agencies have authority over harvest and hatchery production but only advise land and water management agencies on fish habitat protection, so we must work through them and around them to be successful. We need to have agency policy developed to protect native, wild fish and that policy must be adopted as an administrative rule so that it is enforceable. We then must make sure the policy is actually implemented, and we help them do it. It is also possible to force agency compliance by going the legislative route and by using the courts to enforce federal laws where they apply.

The work is never finished and any major initiative often takes ten years to complete. That means a group must make a long-term commitment in developing its leadership, technical ability and funding. As long as the funding is consistent with the mission, the group will be successful, but once the mission is shaped to get funding, then the purpose of the group will also be transformed. A large membership of dedicated people is essential because they supply the unrestricted funding that puts the group at the decision table and gives it the capacity to make sure those decisions are effective on the ground. But there can be tension between the conservation mission and fundraising, and it is tempting for a group to modify its mission in order to attract more money. A group can also have the best intentions but not have the expertise on staff or contract to make those good intentions productive. A successful group is well funded, has an active and productive board of directors, staff expertise, and solid administrative organization, credibility and political savvy. A successful group is focused, which means it cannot do

everything that needs to be done, so it must organize externally with other groups that have complimentary goals so that as a whole they are more effective. A successful group must also be flexible, that is, identify problems and solutions rather than merely respond to issues of the day. Fish conservation groups are a small business that effectively advocate for its stockholder members.