



Strong Runs

Wild is the Future

Newsletter of the Native Fish Society

Fall 2009

THE RIVER STEWARD EDITION

Conflicting management goals

The high cost of hatchery fish

Salmon as livestock

New study shows egg cures kill salmon

River Stewards report

River Steward Program grows



Conflicting goals: Agencies putting resource use before protection and recovery

Harvest and hatchery goals conflict with recovery goals

by **Bill Bakke**
Columbia River Steward

For over 100 years, salmon and steelhead in the Northwest have been managed under government control. The responsible fish management agencies in Oregon, Washington, Idaho and California have consistently exuded optimism about the outcome of their management while the runs of wild salmon have continued to decline. Many of these wild runs are now listed as threatened under the federal Endangered Species Act, and most of the wild populations are a mere sliver of their former abundance. Is it appropriate for the public that funds these agencies to question their management, or should we continue to give them the benefit of our suspended doubt?

When there are problems, such as persistent wild salmon and steelhead decline, the management agencies are accustomed to pointing the accusing finger at other issues such as ocean productivity, dams, forestry, agriculture while keeping their own management programs such as hatcheries and harvest beyond question.

Based on their own scientific evaluation, the fish management agencies have determined that for species with a freshwater rearing life history of one year or more, their hatchery program is a lethal pill. This means steelhead, coho, and spring chinook are adversely affected by hatchery programs. There has not been enough evaluation of hatchery rearing effects on species that reside in streams for less than a year, to determine the impacts of the hatchery program. However, the fish managers are optimistic that there is no impact.

When wild steelhead runs decline, as they have, the fish managers claim the coastal runs are adversely affected by unfavorable ocean productivity. For good measure they add degraded freshwater habitat. By making that claim they hope to divert attention away from their own harvest and hatchery programs and the lack of an effective wild steelhead management program.

Harvest fisheries for trout have expanded bait and barbed hook fishing in streams that has a negative impact on rearing juvenile

salmon and steelhead. This impact has not been evaluated. There is evidence that cured egg bait is toxic to juvenile fish causing 30% mortality. Management assumes a 10% release mortality on adult steelhead with little data to support this assumption under real conditions. When one considers the Columbia River wild steelhead, there is the clash with salmon net fisheries that kill wild steelhead, but the kill is un-quantified, and the impact on wild populations is unknown.

Research on the impact of hatcheries on wild steelhead has identified problems, but management largely ignores those problems. Even though there is scientific evidence that releasing non-native fish into rivers has a negative impact on wild populations, the practice continues.

In their search for a justification for hatcheries the management agencies have embraced the native brood stock hatchery and have deployed them before their impact on wild steelhead has been evaluated. Since 1978, the fish managers have known that a problem exists, for the naturally spawning hatchery fish degrade the reproductive success of the wild fish and the hatchery fish have poor survival in streams. Further research has quanti-

fied the impact on wild steelhead, causing a reduction in reproductive fitness and severe competition.

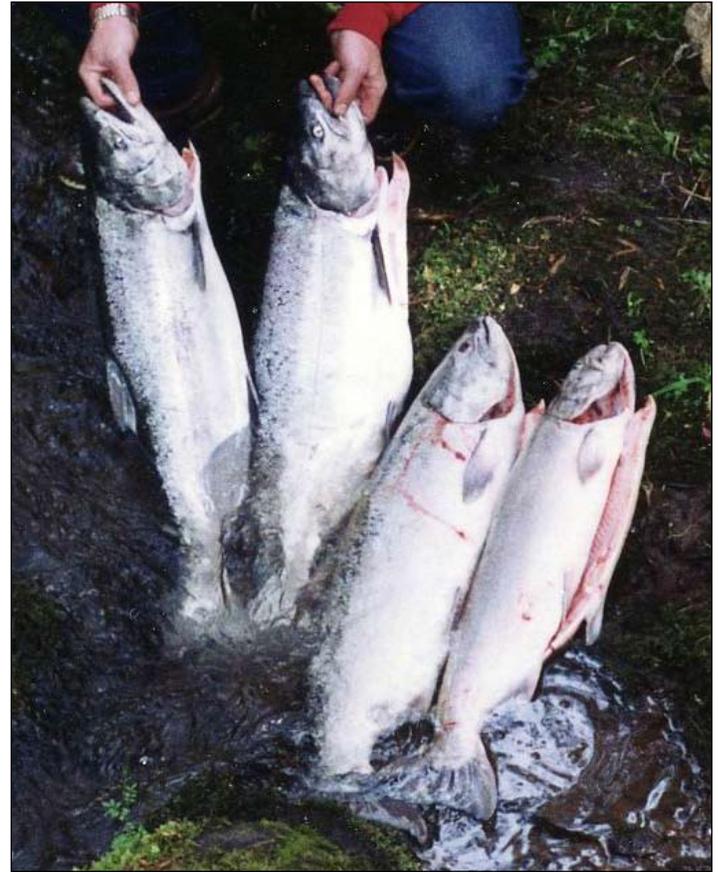
With the support of public funding, the agencies are reducing the reproductive success of wild steelhead with hatchery programs, but that information has not influenced management decisions.

The point is that the fish management agencies have successfully escaped accountability for their management policy, and they use finger pointing to divert attention. Someone or something else causes declines in wild steelhead and salmon, according to the fish managers.

Designed like a corporation, fish management agencies produce a product for utilization with public funding. Hatchery fish are the "product," the user is the "customer," and the purpose is utilization. There is no room for conservation in a commitment to product production for user groups. The fish managers use the simple model of "stock and kill" as their primary policy. It is because of this that the fish management institutions have not developed a conservation requirement to maintain the productive potential of wild salmon and steelhead. Even though conservation is always the primary purpose in their policies and plans, it is never a reality on the river or the ocean. The purpose of management is to kill fish.

“Designed like a corporation, fish management agencies produce a product for utilization with public funding. ... There is no room for conservation in a commitment to product production for user groups.”

A wild coho salmon jumps Singing Falls on an unnamed tributary of the South Umpqua River in November. Many rivers in Oregon saw the largest coho runs on record in 2009. Photo by Stanley Petrowski



Photos by Russell Bassett and Mark Schmidt

Fish management agencies at both the state and federal levels have conflicting goals. On the one hand they are tasked to recover native fish species, which requires a focus on natural production (left). On the other hand, they are also tasked with providing opportunity for both sport and commercial fishermen (right), which is often done through stocking hatchery fish and allowing liberal harvest limits. This conflict of management is impeding recovery of Pacific Northwest salmon and steelhead runs.

Fish management agencies suffer from a conflict of interest: they promote harvest and hatchery production while charged with protecting wild salmon and steelhead. This conflict has led to a persistent and chronic mismanagement of wild salmon and steelhead populations.

Even though the primary and over-riding obligation of the Oregon Department of Fish and Wildlife is to prevent the serious depletion of indigenous (native) fish, conservation has not been the principle driver in decisions made by agency staff or those by the commission. Oregon is not unique in ignoring actual conservation management, for wild steelhead and salmon are in decline across the Northwest involving four states and the province of British Columbia. When wild salmonids are listed as sensitive, threatened, or endangered, a case can be made that serious depletion has not been prevented. The several hundred wild populations that have gone extinct provide conclusive evidence that the fish managers are not doing their job.

A conservation requirement for wild steelhead would include the following biological and habitat needs but would certainly not be limited to only those.

- Spawner abundance objectives by wild population in each watershed.
- Protection of rearing juveniles.
- Protection and restoration of the habitats needed to complete their life history.
- Exclude hatchery fish from wild fish spawning and rearing areas.

- Protect water quality from unfavorable temperatures and from toxic contamination.
- Maintain thermal refuges and access to them.
- Provide adult and juvenile access to the full extent of their natural breeding and rearing areas.
- Manage harvest to protect juveniles and adult spawners and achieve management objectives.

Institutional changes are also needed in order to restructure the management agencies so that the conservation requirement is fully implemented.

- Wild salmon and steelhead management is the primary agency obligation with hatchery and harvest programs serving that primary purpose.
- Establish a strong research program to evaluate management and incorporate research into management operations.
- Establish a commission composed of members that have an interest in wild fish management and have no conflict of interest with that purpose.
- Include wild fish management success as an element in the performance evaluation of the director for the agency.
- Initiate a public outreach and information program to build support for wild fish management.
- Establish a forum for the conservation community to advise the agency on program and budget development.

The high cost of hatcheries

Economic study shows Mitchell Act hatcheries cost taxpayers more than the benefits they provide

by Hans Radtke and Chris Carter
Natural Resource Economists

Forward by Bill Bakke

The following summary of the Mitchell Act Hatchery Economic Study was requested by the Native Fish Society in order to provide our members and the public with understanding and insight on hatchery funding and the cost to provide a fish that is harvested. Since Mitchell Act Hatcheries are paid for with public funds, it's a good idea to know what's going on.

The reader should know that the report summary you are about to read has been officially banned by the National Marine Fisheries Service. That's right; NMFS rejected this evaluation because it did not give them the answer they wanted. When professional studies are suppressed, the public never sees them, but NFS won't let this one be swept under the NMFS office rug.

This summary is based on the full economic evaluation of Mitchell Act Hatcheries which NFS will provide to members of the public upon request. This economic study is part of a larger Environmental Impact Statement being developed by NMFS on Mitchell Act Hatcheries.

NMFS is rather sensitive, for they not only have a mandate to recover ESA-listed salmon and steelhead in the Columbia River; they also fund Mitchell Act hatcheries that are contributing to the extinction of endangered fish. At the very least, NMFS would like to show that their hatchery program is not a deficit spending program to justify its negative effect on salmon recovery.

The summary will point out that the Mitchell Act Hatchery programs are deficit spending and that the primary beneficiaries of hatchery program funding are the fish management institutions.

It is little wonder that NMFS leadership rejected this economic evaluation of its hatchery program and hired another party with the hope there would be a better answer.

Introduction

An economic effects and social implication discussion was developed for Columbia River Basin federal Mitchell Act (MA) funded fish hatcheries by The Research Group, Corvallis, Oregon (TRG). Bill Bakke, executive director for the Native Fish Society, asked Hans Radtke and Chris Carter, who were technical advisors on TRG study, to summarize TRG's findings. This summary paper is written to minimize economic terminology and methodological descriptions so as to make it understandable to a wide audience of reader backgrounds.

TRG collected baseline condition data from hatchery program managers that detailed hatchery operations, administration, and facility capital costs. Relationships between the cost data for raising smolts and harvestable adults were developed. Economic returns were calculated to show benefits from fisheries and benefits to communities where hatchery operations and administration are located. The economic returns calculations included three economic measurements: direct financial value, net economic value (NEV), and regional economic impacts (REI). The NEV was then used in a benefit-cost analysis (BCA) framework. In addition to the hatchery production and resulting economic effect descriptions, TRG also discussed some social implications of the MA funded hatchery operations.

While TRG report has a wealth of other descriptions, this summary paper will center on descriptions for production cost per released smolt or harvestable adult, REI measurements for fisheries and hatchery operations, and the BCA results. The estimated NEV used in the BCA are for commercial harvest and recreational fishing activities. Budgets for various vessel categories involved in harvesting and budgets for processing firms involved in manufacturing primary salmon products are used to develop the commercial active use NEV estimates. The NEV for recreational fisheries relies on recent literature findings. Other benefits not measured by harvesting, such as passive use

NEV, were not included in the BCA equations. The costs used in the BCA were solely hatchery production costs.

BCA can provide useful information. BCA results may be added to the usual political and social considerations to examine the alternatives' economic efficiency standing. In contrast, REI provides estimates of the effects on the regional financial economy of projects with regard to such aggregate measures as jobs and total personal income. The REI information is usually very important to people in the region because funding for the projects is viewed as new money coming from outside the area. This regional point of view is in contrast to the BCA which is from a national accounting stance.

Background

There were 18 MA supported hatchery complexes existing at the time of the investigation. The basis for the funding support is to mitigate for lost salmon and steelhead natural production that came about from Columbia River dam construction and other water and land developments. The production objectives for all of the hatcheries are to augment remaining natural production for the benefit of fisheries. About \$11.5 million out of the \$16 million of MA appropriations are provided annually to state (Oregon and Washington) fisheries agencies, the U.S. Fish and Wildlife Service (USFWS), and treaty tribes for hatchery operations.

Total smolt production by all Columbia River Basin hatcheries in the early 2000's was about 136 million, which is about half of all hatchery and wild production (IEAB 2005). The estimated production of hatcheries wholly or partially funded by the MA in recent years is about 65 million smolts. Harvest contributions from all Columbia River Basin production is more than three-quarters hatchery production in recent years. This is due to fishery management attempts using fish mark selective fisheries, avoidance, and other techniques to reduce impacts on adults from natural production origins.

Columbia River commercial, tribal, and

recreational fisheries are of major economic importance in Pacific Northwest states. Due to the migratory behavior of Pacific salmon and steelhead, fish originating in the Columbia River also contribute to distant water fisheries. For example, a significant proportion of the Chinook catch in southeast Alaska and British Columbia salmon fisheries are from the Columbia River. The U.S.-Canada Pacific Salmon Treaty adjusts allocations between countries, depending on production origin abundances.

Hatchery operations are receiving close study because of their potential impacts to wild runs. Once thought to be straightforward, using hatchery production for mitigating lost habitat due to dam construction has given way to scientific findings about their adverse impacts (NRC 1996).

There is even evidence that salmon enhancement programs on their own, i.e. having objectives not associated with mitigation, provide no net gain to harvests through displacement of productivity in wild-spawners (ISG 1996).

Hatcheries have been referred to as a foolish bargain (Walters 1996). Naish et al. (2008) discusses hatchery production in context with the political response to societal demands for salmon and steelhead harvest and conservation. They found that economic analysis rarely plays a role in decision making for that response. They conclude that knowledge gaps may have prevented that information being generated in the past, but suggest that future political responses need not be made in ignorance of economic implications.

Several hatchery review projects have been completed or are underway in the Pacific Northwest to determine ways hatcheries can operate to reduce impacts to wild spawners. The approach used in the State of Washington started in 1999 was directed by Congress in 2005 for application to the entire Columbia River Basin. This review is called the Columbia River Basin Hatchery Reform Project and \$3 million was appropriated by Congress for NOAA Fisheries to undertake the review. The process has been completed and final recommendations can be found at: <http://www.hatcheryreform.us>. Economics was not explicitly used as criteria to decide on the final recommendations.

Inputs Into the Economic Analysis

It is essential to determine the costs of



producing salmon and steelhead for economic analysis modeling. Typically, costs can be separated into the following categories:

- Operations and maintenance (O&M) costs.
- Indirect costs.
- Capital costs (facility construction and new equipment purchases necessary to change operation practices and or expand production).

O&M costs typically refer to those variable costs that pertain directly to the day to day operations of hatcheries and often includes annual maintenance costs to keep the hatchery operable. Indirect costs typically refer to overhead costs, administrative costs, headquarters costs and the like. The treatment of capital costs deserves some special attention when a BCA is conducted on hatchery development. Original facility construction costs may sometimes be considered “sunk costs,” particularly if the hatchery was built 20 or 30 years ago, or last had major modifications that long ago. However, decisions made today that have long term cost implications for the future should consider all relevant costs, including capital construction costs. Because Columbia River Basin hatcheries are being reviewed for long term policy changes in terms of their contribution to harvest and their impact on salmon recovery, the consideration for including all relevant costs is meaningful.

MA funded hatchery system outcomes, such as harvest benefits, depend on production and ecosystem conditions over which agencies may have no control. These conditions affect the smolt survival rate (SAR). While not yet fully understood on an ecosystem basis, ocean conditions appear to strongly influence SAR.

A hatchery consequence model was used for determining estimates of harvests and hatchery returns. The hatchery model uses early 2000’s broodstock SAR and recent years’ ocean and river harvest exploitation rates. The hatchery consequence model’s output was adapted to reflect actual 2006-2007 agency hatchery production. The marine fisheries harvests were assigned to economic regions corresponding to available economic models for use in the economic analysis.

Analysis Results

The economic analysis results are provided for production costs and three measurements of economic returns. One economic return measurement is direct financial value, the value that a commercial harvester receives (usually called ex-vessel value) or that a recreational angler spends per fish. Another is a benefit-cost comparison of a measurement for generated net economic value to the costs of hatchery production. The third is a measurement of income and resulting employment that may be created from harvesting and producing salmonids at the MA funded hatcheries.

Hatchery costs generally depend on the size of smolts at release. Fall Chinook, which are usually reared at a size of 30 and up per pound depending on whether they are up-river bright or tule stocks, average \$0.176 per smolt, spring Chinook and coho are usually released at 10 to 15 per pound which cost about \$1.09 per smolt, and steelhead which are released at larger sizes at 6 to the pound cost about \$2.55 per smolt.

See **Economics**, Page 12

Sulfite cures kill juvenile salmonids

ODFW study documents lethal effects caused by salmon eggs cured with sodium sulfite

by **Rob Russell and Bill Bakke**
Nehalem and Columbia River Stewards

ODFW researchers released findings Dec. 17 showing up to 30 percent mortality in juvenile salmonids that ingested sulfite cured roe. Sodium sulfite, the most popular “bite stimulant” in modern salmon cures, was clearly identified as the culprit. Early reports from the study had shown much higher mortality in rainbow trout, up to 60 percent from ingestion, but the final report tempers those findings.

For those who market sulfite cures, this should come as no surprise. Sodium sulfite, and its relatives sodium bisulfite and sodium metabisulfite, are all linked to cancer in laboratory animals and humans, while not officially recognized as carcinogens by the National Cancer Institute. Those who cure eggs commercially, and those who have regular contact with cures and cured eggs, know the caustic effects first hand. Eyes and lungs burn, noses bleed, and skin becomes irritated. Some people report the development of allergies after repeated exposure.

Jeff Mishler, a long time advocate for wild salmonids, instigated the study in 2008 after becoming concerned about the potential harm sulfite cures might be having on baby salmon and steelhead.

“I had heard stories of trout dying from eating cured eggs,” Mishler said. “Then one day while I was bobber fishing with my Dad, I noticed swarms of young-of-the-year steelhead pecking at our baits. Then we noticed the shoreline. Bait anglers had disposed of their old bait along the beach, creating a fuzzy pink margin along the river bank. Baby steelhead were eating them like crazy, and cutthroat hung behind waiting for an easy meal. It suddenly occurred to me that the poisons in cured eggs could be having serious impacts.”

Over the year that followed, Jeff saw this scene repeated everywhere he went. Finally, his concern demanded action, and he worked with an ODFW and Oregon State University research team to craft a study.

The research discovered that within a 23 day span 30% of the

juvenile salmonids were killed. Upon further investigation, they found that eggs cured with sodium sulfite were lethal. It is this chemical that kills the fish.

They also tested the eggs by giving them a soak to see if they were less lethal. They were testing whether fishing softened their impact. Soak times ranged from 30 seconds to 10 minutes, but the results were the same: the fish died.

Additional research on nutrient enrichment of salmon and steelhead streams has pointed out the fact that eggs are preferred by juvenile salmonids. Most salmon eggs are available in early winter months when the juvenile fish are seeking food in cold water when other food supplies are less abundant.

Juvenile fish are seeking the fat rich eggs and anglers fishing steelhead and salmon are using cured eggs. The combination is lethal.

Now that this study has been released, anglers and the sportfishing industry are unsure what will happen next. Advocates for wild steelhead and salmon are working hard to spread the word, and push for a ban on sulfite cures. Debate is likely to flare, and more study will undoubtedly be called for to prolong any action.

“The smart manufacturers will simply design new cures that are not poisonous to our fish,” Mishler said. “Anglers want to do the right thing, and will undoubtedly move toward products that are safe for salmon.”

Ed Bowles, chief of fisheries at ODFW, was careful to clarify that the new study does not attempt to quantify the impact these poisonous bait cures have on fish populations.

“We’re not interested in doing that research. It would be incredibly difficult and costly, and it’s not necessary,” Bowles said. “While this doesn’t appear to represent a crisis, we’ve found out that these cures present a non-targeted impact on our salmon and steelhead. Manufacturers need to adjust and get on with it.”

ODFW officials said in a news release that “We’ve already talked with several manufactures and we’re encouraged by their commitment to solving this problem.”

However, ODFW researchers said they “...cannot predict what impact, if any, the ingestion of cured eggs by juvenile fish has on the final size of the adult population.”

In the research proposal to investigate the toxic effect of cured salmon eggs on juvenile salmonids, there is evidence of even more mortality than what was found in the ODFW-OSU research. A 1979 study showed that consumption of borax cured eggs led to decreased growth and an increase in plasma corticosteroids in chinook and rainbow trout juveniles.



When salmon are treated as livestock, wild fish suffer

by **Russell Bassett**
Molalla River Steward

Salmon are not cows. Most everyone can name many, many differences between salmon and cows, but one significant difference, one that many people overlook, is that salmon have a very important wild component.

Cows, while equally tasty, are anything but wild. Although rodeo cowboys will tell you cows can give one heck of a wild, 8-second ride.

One thing that salmon and cows have in common is that they are both being raised as livestock. When salmon livestock intermingle with wild salmon the results, in many cases, are depleted wild salmon runs. Cases in point: The Frazier and Columbia rivers.

Fish farming in British Columbia is corporate fish ranching at its worst, and much of that is due to the farms locations, which in B.C. are often in bays and rivers. This proximity to young wild salmon is damaging salmon and steelhead runs. The complete collapse of the Frazier sockeye salmon run has been blamed on these salmon farms. Yet the British Columbia government still considers the salmon farms good business. Although they did have the good sense in 2008 to put a moratorium on salmon aquaculture growth in the province.

One of the problems caused by salmon farms in B.C. that has made news recently is sea lice infestations. When young wild salmon swim by the farms, they pick up lethal amounts of sea lice.

This problem looks more and more like a main contributor to the extinction of several wild Pacific salmon populations if the problem isn't fixed quickly.

Other problems with these farms include spread of other parasites and disease to wild fish, chemical treatments, the amount of wild "feeder" fish killed in the ocean to feed the farmed salmon, algae blooms, waste build up on ocean floor and waste wash-up on beaches, other types of marine life deaths caused by the farms, and presence of cancer-causing chemicals in some farmed salmon.

For some reason, many people don't



seem to mind that the fish they are buying has had its sea lice killed off and coloring added. Seems these people won't buy white salmon, but they don't seem to care that it is been artificially made pink. They also don't seem to care that they are supporting a multi-billion dollar industry controlled mostly by Norway and other foreign countries that are harming wild Pacific salmon runs. Would those same people buy white beef that had been artificially colored red?

Two lawsuits filed in 2009 showcase the damages caused by B.C. salmon farms to salmon and steelhead runs.

The first is a class action lawsuit brought by the Kwicksutaineuk and Ah-Kwa-Mish First Nation, against the provincial government who authorized 29 fish farms in the Broughton Archipelago. The Fish Nation lawsuits blames salmon farms for massive declines in salmon returns to the rivers within their territories.

In a preliminary hearing, the court ruled that salmon farms must be regulated as fisheries rather than agricultural crops, eliminating any private rights to the water use in the farming operation.

The second lawsuit was filed by Alexandra Morton and her group adopt-a-fry. Morton alleges that Marine Harvest Canada

violated the Fisheries Act by illegally possessing large numbers of juvenile wild salmon which were inadvertently taken during careless maintenance at the fish farm facilities.

These lawsuits have added weight to the case against the fish farms, and are cause for hope for the salmon and steelhead runs currently being damaged by the farms.

The Columbia River is another example of the damage that can be caused by raising salmon as livestock.

The Columbia hatchery system encompasses 178 different programs run by state, federal and tribal operators. These programs release millions of hatchery-raised salmon and steelhead into the Columbia River and its tributaries.

In the Columbia River Basin, according to a 2000 report released by the National Marine Fisheries Service, hatchery fish make up 95 percent of the coho, 70 to 80 percent of the spring and summer chinook, 50 percent of the fall Chinook, and 70 percent of the steelhead.

See **Livestock**, Page 15

River Stewards report

by Will Atlas, Bill Bakke, Russell Bassett, Jeff Hickman, Rob Russell, and Matt Stansberry
NFS River Stewards

Timber harvest in Oregon state forests

As we end out the year, we can look back on a very defensive fight to hold our ground in respect to State Forest lands. This is a crucial fight. We must sternly maintain pressure to protect our public forests and the precious rivers and native fish they feed. The Tillamook alone is the largest remaining coastal forest in the lower 48 states, comprising over 520,000 acres of forest!

On June 3, the Board of Forestry voted to increase the areas open to clear cutting from 50% to 70% of the Tillamook and Clatsop State Forests. The board's decision authorizes increased clear cutting of thousands of acres of forests including critical Salmon Anchor Habitats. Numerous Oregonians, including Senator Jackie Dingfelder and John Kitzhaber, had written the Board prior to this meeting in attempts to dissuade them from increasing the cut.

Current state law requires protections for the streams in the Tillamook and Clatsop forests, which are still recovering from the unsustainable timber harvests and related road building of the past. While the law requires that Board decisions result in a high probability of maintaining and restoring aquatic habitat, their own biologists found that the proposal had a low probability of keeping many key salmon basins on a positive trajectory.

In response to this, NFS joined the Oregon Chapter of the Sierra Club, Northwest Guides and Anglers Association, Pacific Rivers Council, Wild Salmon Center, Association of Northwest Steelheaders, Coast Range Association, and the Center for Biological Diversity in filing a formal Petition with the Oregon Board of Forestry requesting that the Board reverse its illegal decision to increase clear cutting and begin to engage in an open, transparent and scientific process to pursue a management approach consistent with applicable law.

The Board remains without a formal response to the petition. The coalition is now taking next steps, including meeting with county commissioners outside of Tillamook and Clatsop, urging them to file resolutions from Forest Trust counties against the board's decision to increase timber harvest.

At the Nov. 7 Board of Forestry meeting in Tillamook, the Board opened up the Greatest Permanent Value discussion. They want to revisit the rule and address the Oregon Administrative Rules pertaining to its definition. This is a very important process as this can alter the rules which govern forest management decisions.

NFS Tillamook Bay Rivers Steward Jeff Hickman has joined a public advisory committee to provide input towards an updated definition of the Greatest Permanent Value. This committee met for the first time on Dec. 2 and will continue to conduct several more meetings over the next four months. These meetings will be structured to provide input and guidance for the BOF on how to best balance economic, environmental and recreational uses on State Forest Lands.

The Tillamook and Clatsop State Forests that are affected by the Board of Forestry's decision are home to some of the healthiest

remaining runs of wild fish in the lower 48 states. These forests and the health of their watersheds face an uncertain future if the board is not convinced to change its current path.

Clackamas bull trout reintroduction

The Fish and Wildlife Service announced plans recently to reintroduce Bull Trout to the Upper Clackamas River just outside of Portland. The plan calls for releasing around 30 adult, 30 sub-adults and as many as 2000 juveniles in the first wave of the reintroduction which could begin as early as this summer.

Bull trout were historically abundant in the Clackamas as well as a number of other rivers in the area. Today bull trout populations in the lower Columbia are highly fragmented by dams and populations have been reduced to a fraction of their former size. Fish introduced to the Clackamas will be taken from the Metolius River which has a relatively healthy population of the large, piscivorous predators.

Recovery actions for Molalla River steelhead and spring chinook

The Native Fish Society was on contract last fiscal year with the National Marine Fisheries Service to develop recovery actions for ESA-threatened Molalla River winter steelhead and spring chinook.

The Upper Willamette Recovery Plan stakeholder group agreed to incorporate those recovery actions into the Upper Willamette Recovery Plan, which is scheduled to be completed in 2010. The recovery actions included a whole suite of habitat protection and improvement actions.

One exciting aspect of these recovery actions is a reintroduction of wild spring Chinook, as decided upon by the Molalla River Alliance Science Committee. The Science Committee is led by NFS Molalla River Stewards and includes NMFS, ODFW, and Steve Smith, a fisheries consultant, who has done tremendous pro bono work on this effort.

The reintroduction includes changing the hatchery management from South Santiam stock to Clackamas stock, planting of live adults, acclimation pens, naturalized broodstock in later years, possible other-than-adipose marking of release smolts, increased monitoring, among other changes to the status quo. The reintroduction will be a lot of work and money, and all interested parties are still working out the details and trying to determine how it will be funded.

Defense of N. Umpqua catch and release regs for wild winter steelhead

The Oregon Department of Fish and Wildlife Commission voted

in 2007 to make wild steelhead in the N. Umpqua catch and release only. This was a marked change from the limited (1 a day, 5 a year) wild harvest allowed before this ruling took place. In 2008, the agency again tried to open a wild kill fishery, and again the Commission voted in favor of catch and release. In 2009, ODFW again tried to open a limited harvest; however, a strong backlash prevented the agency from moving forward.

A letter from ODFW Fish Division's Bruce McIntosh, acknowledged that the department is looking at starting a winter steelhead stocking program, and put us all on notice that the debate is not over. The letter said wild harvest would be approached during the creation of Coastal Winter Steelhead Native Fish Conservation Plan, which starts in 2010. NFS River Stewards are involved with a coalition working to create a citizen-based plan to be included in the ODFW coastal winter steelhead plan, which is scheduled to begin development in 2010. This will be a big deal because ODFW will likely oppose this citizen-generated plan that does not have a wild harvest component.

Weirs needed on the John Day

The high stray rate of barge transported steelhead, primarily from Snake River hatcheries, are a growing threat to wild John Day River steelhead. There is no hatchery program on this river, but hatchery strays are now 29-41% of adult steelhead found throughout the John Day Basin.

The Mid-Columbia Steelhead Recovery Plan notes this problem on the John Day and Deschutes Rivers. ODFW and NFS have begun to place weirs on tributaries of the Deschutes River in order to exclude hatchery fish from spawning naturally with wild steelhead.

A similar program is needed for the John Day River. The steelhead are listed as threatened and the state manages it as a wild salmon and steelhead reserve. The stray, barged hatchery steelhead are a threat to wild steelhead and to their recovery under the ESA.

WDFW Commission adopts new policy on state's hatcheries and fisheries

The Washington Fish and Wildlife Commission voted in November to adopt a new state hatchery and fishery reform policy designed to accelerate recovery of wild salmon and steelhead while also supporting sustainable fisheries.

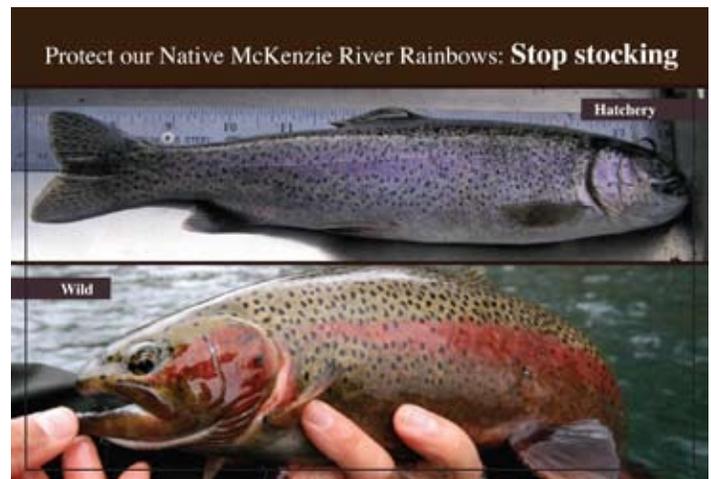
The new policy, which has been under review by the commission and the public since last spring, establishes guidelines for realigning state fisheries and hatchery programs to meet conservation and harvest goals for salmon and steelhead in each watershed.

The new policy is intended to provide clear direction for WDFW, which has already begun to incorporate recommendations by the independent Hatchery Scientific Review Group (HSRG) into its hatchery-management practices.

Key provisions of the new policy call on the department to:

- Increasingly focus state commercial and recreational fisheries on the harvest of abundant hatchery stocks to support sustainable fisheries and reduce the number of hatchery fish spawning in rivers.
- Develop and promote alternative fishing gear to maximize the catch of hatchery-origin fish with minimal mortality to native salmon and steelhead.

- Improve the fitness and viability of wild salmon and steelhead runs by working toward a goal of meeting HSRG broodstock standards in all state hatchery programs by 2015.
- Integrate hatchery-reform initiatives into comprehensive action plans designed to meet conservation and harvest goals for specific watersheds throughout the state.
- The policy adopted by the commission also directs WDFW to seek necessary funding "from all potential sources" to implement these hatchery-reform measures, expand selective fisheries and ensure state facilities comply with standards for fish passage, water-intake screening and pollution control.



Wild fish advocates mount campaign against McKenzie River trout stockings

Rainbow trout hatchery programs on the McKenzie River are putting wild redband trout at risk. The state started planting hatchery rainbows in the McKenzie in 1921, and it hasn't let up since.

Wild McKenzie redbands are thriving in 38 river miles where trout are not stocked, but ODFW is imposing a hatchery trout stocking program, which its own officials call a "sacrifice zone," in 42.3 miles. Of 57 relatively easily navigable river miles, 42 miles are heavily stocked with hatchery trout. That's 74% of the navigable river.

ODFW's public documents (McKenzie Fish Management Plan 1997 and McKenzie Sub-basin fish management plan from 1988) cite this hatchery trout program as the primary culprit in depressing native trout populations on the McKenzie River.

ODFW is a public agency beholden to us, and if enough people express outrage that tax-payer dollars are funding the destruction of our wild fish resources, change will come. The campaign to reduce or stop the trout stockings is currently reaching out to some key folks, including state legislators, county commissioners, travel and tourism agencies and ODFW commissioners.

NFS recently joined the campaign, which is spearheaded by the local chapter of Trout Unlimited and the Caddis Fly Shop. Other actions include reaching out to local fly fishing chapters and guides, urging them to call for change.

On Feb. 12, wild trout advocates will publicly square off against the planter-pushers at the McKenzie Watershed Council meeting.

Keep your ear to the ground for some big updates.

Dedicated volunteers, incredible achievements

NFS River Steward Program expands in 2009

by **Russell Bassett**
Molalla River Steward

The concept of river stewards is not new. The earliest stewards, or riverkeepers, served their communities as far back as the Middle Ages. They patrolled village streams and rivers to protect them for the benefit of all inhabitants. The first full-time U.S. riverkeeper was a former commercial fisherman turned activist who was hired in 1983 by the Hudson River Fisherman's Association to help identify polluters who were breaking environmental laws on the Hudson. During the past 25 years, riverkeeper programs have emerged in large urban rivers like the Willamette as well as classic fisherman's rivers like the Russian River of California. Today, the growing population creates challenges that were inconceivable for the early river stewards. Development, water rights, land use, farming, roads, hydro projects, recreation, commercial and sport fishing, hatcheries, logging, and climate change create greater impacts on our river systems.

Thankfully, there are dedicated individuals who have taken on this daunting task on many Pacific Northwest rivers – the Deschutes, the North Umpqua, the Rogue, the John Day, the Klamath, the Skagit, and the Molalla, to name a few. Native Fish Society River Stewards are mentored through a program that includes scientific and geologic education, retreats, policy issues, and tools to encourage involvement of local citizens. With more than 50 years of dedicated wild fish advocacy and study, the NFS staff provides for the growth and effectiveness of the Stewards.

The NFS River Steward Program began six years ago with the original purpose of compliance monitoring, making sure the Oregon Department of Fish and Wildlife fish management program is consistent with the Native Fish Conservation Policy. The program has grown considerably since its conception, and while NFCP compliance remains a strong focus, NFS River Stewards go beyond compliance to conserve, protect and restore native fish populations in their watersheds through a variety of ways, including identifying threats to recovery and developing solutions; creating coalitions to stop threats to native fish; participating in habitat restoration, nutrient enhancement, fish and temperature monitoring, public education and community outreach, among others.

There are currently more than 50,000 square miles of Oregon and Washington watersheds covered by 29 NFS River Stewards.

In its first six years, the River Steward Program has seen many incredible accomplishments for native, wild fish and their habitats in the Pacific Northwest. Some of the accomplishments made by made River Stewards in 2009 include:

- Stopped threats to the Metolius River from destination resorts.
- Installed hatchery-fish exclusion weirs on the three most important wild steelhead spawning tributaries of the Deschutes River.
- Completed work on the first draft of Oregon's next conservation plan through participation in the South Coast Fall Chinook Native Fish Conservation Plan Advisory Committee.



Photo by Russell Bassett

Native Fish Society River Stewards and guests pose for a photograph during the 2009 River Steward retreat on the N. Umpqua in August

- Moved the Molalla River much closer to receiving Wild and Scenic designation, protections we expect to earn in 2010.
- Successfully defended no kill of N. Umpqua wild winter steelhead.
- Conducted detailed temperature monitoring of the Salmonberry and Molalla Rivers.
- Placed Angler Education signs on the John Day, Molalla, and Salmon rivers.

The Native Fish Society owes much of its success to the River Steward Program. This volunteer program has produced the most effective group of native, wild fish advocates on the planet.

One river that has seen remarkable victories in a few short years due to the Native Fish Society River Steward Program is the Molalla River, which now has the healthiest run of Upper Willamette winter steelhead, thanks in large part to the Stewards' efforts. The following is a timeline of accomplishments made by NFS Molalla River Stewards to protect and restore the river's native fish populations.

- 2003: Stopped a proposed gravel mine in the river's floodplain.
- 2005-present: Conducted spawning surveys of winter steelhead and spring chinook.
- 2005-present: Delivered more than 10,000 hatchery salmon carcasses to the river for nutrient enhancement.
- 2005-present: Participated in environmental education, twice annual river cleanups, and trail enhancement through a partnership with the local watershed council.
- 2005-2006: Mounted a campaign to stop the city of Molalla from discharging treated sewage into the river that included a lawsuit against the city of Molalla for ten years of violations of the to the Clean Water Act. A settlement with the city brought \$110,000 to the river for native fish restoration projects. The campaign also resulted in a first-ever ballot measure to the residents of Molalla which permitted the citizens to choose whether or not they wanted wastewater from the city to be discharged into the river.



Photo by Russell Bassett

NFS Molalla River Steward Mark Schmidt and NFS member Bill Taylor place temperature monitoring devices in the Molalla River this summer.

versial when they are proposed, but you did all the groundwork. What impressed me the most about the project is the way you guys put it together. You made the partnerships, you embraced the community, you talked to the different players. Frankly, you guys are a good example of how projects should be put together going forward.”

These are just a few examples of the many River Steward Program successes. The River Steward Program works! We have great confidence in the “grassroots up” emphasis of the program because we know that an individual with the passion for his or her home waters can best overcome government inertia and apathy. Here are just a few examples of what River Stewards are working on in 2010:

- 2005: Replaced a fish barrier culvert on Russell Creek with a bridge that opened up an 8 acre wetland to salmonid rearing.
- 2006-2009: Received three \$10,000 contracts from National Marine Fisheries Service to continue fish enhancement projects on the river.
- 2007-present: Facilitated the start of the Molalla River Alliance, which has been instrumental in reducing lawlessness in Molalla River Recreation Corridor, and which has had bills introduced in U.S. House and Senate to designate 21 miles of the Upper Molalla as Wild and Scenic. In November, the House voted 292-133 in favor of designation.
- 2008: Effected angling regulation changes that moved the salmon and steelhead fishing deadline four miles downstream and removed the use of bait on the river for 10 months of the year.
- 2008: Placed angling regulation signs throughout the drainage.
- 2009: Began a temperature monitoring program of the Molalla River, using temperature gauges spread throughout the drainage.
- 2009: Wrote recovery actions for Molalla River winter steelhead and spring Chinook that are being incorporated into the Upper Willamette Recovery Plan.

- 2009: Developed a wild spring Chinook reintroduction plan that is being incorporated into the Upper Willamette Recovery Plan.
- 2009-2010: NFS has submitted funding proposals to create Large Woody Debris habitat on the North Fork Molalla, replace fish barrier culverts on Cedar, Pine and Trout creeks, screen an irrigation ditch on Shady Dell Creek, and conduct a study of Upper Willamette coastal cutthroat.

During a visit to the Molalla in September, U.S. Representative Kurt Schrader, who introduced the Wild and Scenic bill in the House said, “These things can be contro-

- Develop a detailed threats assessment of the Upper Deschutes Basin
- Stop the Oregon Board of Forestry from increasing timber harvest in Oregon state forests.
- Develop alternatives to a dam on Bridge Creek of the middle-fork John Day.
- Work within the City of Medford’s Comprehensive Plan to ensure fish-bearing Bear Creek tributaries are treated as such when the city approves development permits.
- Reduce or stop the stocking of triploid trout in the McKenzie River and ensure that ODFW does not increase trout stockings in the state’s flowing water.
- Create a citizen-based North Umpqua winter steelhead plan to be included in the ODFW coastal winter steelhead plan.



Courtesy photo

NFS Tillamook Bay Rivers Steward Jeff Hickman leads a coalition of anglers and conservationists who testified before the Board of Forestry in June urging the board not to increase timber harvest in state forests.

**Benefits From Fisheries and Marketable Hatchery Returns and
Hatchery Production Costs by Species**

Species	Smolt Releases	Production Cost (\$000's)	Harvest and Hatchery Returns NEV (\$000's)					Net Benefits (\$000's)
			Treaty			Hatchery		
			Commercial	Commercial	Recreational	Returns	Total	
Fall Chinook	43,043,000	\$7,592	\$714	\$309	\$2,694	\$48	\$3,765	-\$3,827
Spring Chinook	3,881,120	\$4,220	\$50	\$106	\$3,419	\$6	\$3,582	-\$638
Coho	16,310,000	\$14,251	\$474	\$187	\$8,001	\$28	\$8,690	-\$5,562
Summer steelhead	794,000	\$2,039	\$0	\$9	\$1,354	\$1	\$1,364	-\$675
Winter steelhead	895,000	\$2,260	\$0	\$0	\$1,478	\$1	\$1,479	-\$782
Total	64,923,120	\$30,363	\$1,239	\$611	\$16,946	\$84	\$18,879	-\$11,484

- Notes: 1. Production costs include MA funding, other funding sources used at hatcheries where MA funding occurs, and estimated capital costs.
 2. The net economic value (NEV) includes active use effects from all Columbia River inland, U.S. West Coast, Alaska, and British Columbia harvesting and processing regions. NEV does not include passive use valuations.

Economics, from page 5

The total hatchery cost per harvestable adult ranged from \$56 for coho to \$229 for winter steelhead with an overall average cost per harvestable adult for all species of \$73. For all species, total hatchery costs exceeded the economic returns using measurements for direct financial value by a ratio of 1.2. That means that overall it costs \$73 to produce a salmon for which \$60 is received by a commercial fisherman and what a recreational angler spends. The only species production that is less than one is spring Chinook at 0.9, which is a reflection of its higher commercial harvest price and its recreational angling attraction.

The production costs of the 65 million MA hatchery releases is estimated to be \$30.4 million (including MA funding, other funding resources, and annualized capital costs).

The benefits as measured in this paper are estimated to be \$18.9 million annually. The BCA analysis resulted in a minus \$11.5 million calculation under baseline SAR's with annualized capital construction costs included (Table 2).

When the assumption is made that hatchery costs are paid from money originating outside the study region, then resulting income and employment in the Pacific Northwest Region is considerable as measured by REI. The contributions are in those economies where the hatchery produced adults are caught, including Alaska, British Columbia, and ocean and river regions

in Washington and Oregon; and, where hatcheries and administration services are located. The annual MA funding for hatchery operations and administration generate about \$50.3 million in regional personal income which translates to 1,400 full and part-time jobs (Figure 1). About 46 percent is from fishery related effects and business use of marketable surplus hatchery returns. The other 54 percent are contributions made in local economies from hatchery operations and administration. The fisheries and operations contributions are especially important to rural economies dependent on fisheries and/or where hatchery operations occur.

**Discussion of
Analysis Results**

The negative BCA calculation of a minus \$11.5 million for hatchery production is not unusual. Carter (1999) found, for example, that coastal Oregon COH hatchery production SAR's of at least 1.7 percent coupled with selective retention management would be needed to generate positive BCA. Oregon Coast hatcheries rarely attain this SAR level. For example, the Bandon Hatchery located along the southern Oregon Coast had fallen below the level in three out of six years for the 1995-2000 brood years and the Salmon River Hatchery on the northern Oregon Coast did not attain that level in any of those same brood years. Caudill (2002) reported the economic contributions and hatchery costs for four mid-Columbia River USFWS

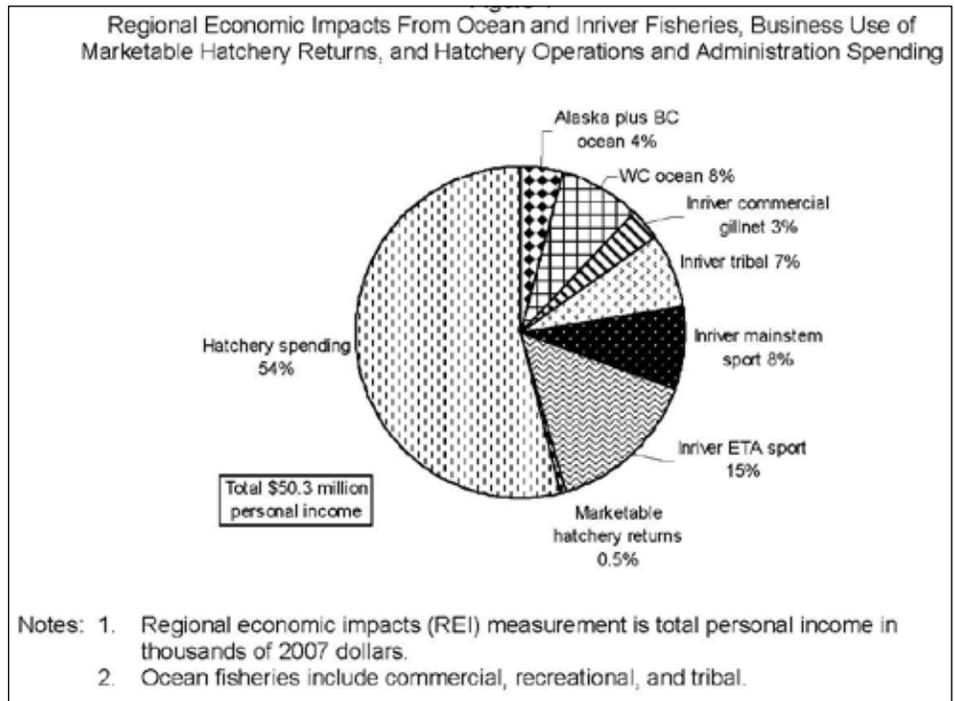
hatcheries. An extension of that information can be interpreted to show a negative BCA for the USFWS hatcheries. Pearse (1994) studied the British Columbia hatchery system. The BCA results varied widely at the individual hatchery level, but overall generated a 0.6 benefit to cost ratio. The author provided additional investment strategy information by dropping past capital cost expenditures. The benefit to cost ratio rose to 1.6. Similar BCA questions have arisen concerning the Alaska Salmon Enhancement Program (Boyce et al. 1993).

The calculation of BCA is dependent on the highly variable SAR parameter and assumptions about cost accounting policies. An uncertainty analysis using ranges for the economic modeling parameters shows that when smolt-to-adult survival rates are increased 60 percent over the modeling baseline conditions, then the benefit-cost analysis moves into a positive range. Also, when cost accounting definitions exclude administration and management and/or facility capital costs, measurements of economic returns also move towards a positive range. Making these accounting assumptions would not be sound policy when considering long run public investment strategies. Centralized administration and management of hatcheries is not a discretionary cost item given the management complexities and interrelationships with ecosystem conservation obligations. Annualized capital costs not only represent the costs of the past construction, but also life cycle replacement costs that will be necessary in the future.

It is not argued that the hatcheries should operate with a positive benefit-cost calculation. They were built and operate to mitigate in a much more involved economic and social context. The usefulness of such a measurement can be to show economic efficiencies in different hatchery production or operation alternatives and/or to decide on alternative means for accomplishing the same objectives to sustain fisheries. It is a comparative tool that can provide insight into the existing baseline condition effects and relative magnitude and direction of economic changes associated with hatchery operation and practices changes.

Economists have defined and occasionally measured values associated with the simple existence of natural fish populations. The value is reckoned as the amount that people (counted appropriately) would be willing to pay to assure the existence of a fish stock, or to pay for a specified increase in the fish stock. The valuations are important for bringing into perspective market and non-market use values, such as commercial and sport fishing as compared to the non-market, non-use existence values. Policy discussions about continuing or refining artificial propagation whose purpose is to support fisheries need to consider society's comparative importance on the continued existence of natural origin salmon and steelhead stocks.

Social implications were qualitatively discussed using indicators for income distribution, quality of life, local government fiscal conditions, and cultural effects. The discussions are an interpretation for how changing hatchery operations may disproportionately affect socioeconomic groups using federal environmental justice criteria. The interpretations are based on a methodological approach to answer the contentious question for fair distribution of environmental burdens and benefits. It is not a surprise that American Indian ethnicity in certain geographic areas are a socioeconomic group particularly vulnerable to hatchery system changes. Given the group's thousands of years of life dependency on Columbia River fish resources, an analysis of hatchery production and practices changes may more appropriately be analyzed from a pre-hatchery system condition rather than a status quo condition. This finding is particularly apropos to current policy considerations for MA funded hatcheries because of the drastic alteration in natural origin salmon and steelhead populations caused by the initial MA funded hatchery system. The



initial hatchery system development was designed to and accomplished by moving natural origin populations lost to upstream hydropower development to lower river hatchery production.

These economic analyses and social implication discussions should prove useful in understanding the effects from hatcheries whose purpose is fishery augmentation.

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Livestock, from Page 7

Hatchery salmon and steelhead now make up more than 80 percent of the total Columbia River runs, and many of those runs are now federally listed as threatened or endangered.

Despite the steady influx of hatchery fish, wild steelhead have dropped 75 percent in the last 30 years, and wild spring chinook have dropped more than 95 percent in the last 40 years. When looked at from an historical context, the wild runs are a mere fraction of what they were. This represents a serious crisis; one that cannot be solved by continued management of salmon as livestock.

Hatcheries were built with public funds to mitigate for salmon and steelhead losses due to dams. The prevailing assumption has been that humans can successfully create more salmon and steelhead by artificially producing them. Considering the continued decline of salmon runs, that assumption is false.

Mitigation has failed. Even the commercial, sport and tribal fisheries that rely on and support hatcheries are not happy, as they fight over the few remaining fish.

The damage to wild fish caused by hatchery fish has been clearly documented by science. This damage occurs in several ways including domestication, loss of biodiversity, low survival to adulthood, spread of disease to wild populations, increased predation on wild fish, and competition with wild fish.

A study released in June 2009 by ODFW and Oregon State University makes this threat very clear. The study showed that naturalized offspring of two hatchery fish are less able to survive

than the offspring of two wild fish.

The extensive hatchery reform effort now taking place in the Columbia River and throughout the state of Washington are a strong indication that there is a severe conservation problem related to hatcheries. These reforms include the 2009 recommendations of the Hatchery Scientific Review Group and the new hatchery policy adopted by the Washington Department of Fish and Wildlife.

These reforms and the other volumes of science that highlight the dangers of hatchery and wild fish interaction give cause for hope.

Like fish farms, hatcheries are not inherently bad. It's how they are operated that is causing the problem. Fish farms and hatcheries should be operated so they do not create interactions with wild salmon and steelhead.

For example, in Iceland salmon farms are permitted and regulated so that they are not in conflict with important wild salmon rivers.

Another example is the Clackamas River. The river's North Fork Dam, which is operated by Portland General Electric, allows managers to sort out hatchery fish, maintaining the upper river as a spawning and rearing refuge for wild salmon and steelhead. The wild populations have responded with increased wild populations from critically low levels in the late 1990s.

Salmon are not cows, and when salmon are raised like livestock, great care must be taken to ensure they do not mingle with wild populations. Events in 2009 give cause for hope, but pressure and encouragement of our governments to change their policies needs to continue if wild fish are to survive and thrive.

NFS upgrades its web presence

Realizing that effective public outreach in the digital age includes utilizing social media, the Native Fish Society recently upgraded its Internet presence. NFS now has a home on Facebook that includes feeds from NFS bloggers, discussions, videos, photos, and much more. NFS is also in the process of setting up a YouTube Channel, which will contain all the conservation videos NFS has created.

Several NFS staff and volunteers have also gotten into blogging. N. Puget Sound Steward Will Atlas runs the excellent fish conservation news service The Osprey Steelhead News, Executive Director Bill Bakke does what he does best at Wild Fish and Wild Rivers, River Steward Coordinator Russell Bassett blogs about local conservation issues at WildFish4Every1, Tillamook Bay Rivers Steward Jeff Hickman writes a conservation-minded fly fishing blog at The River Writes, John Day Steward Mia Sheppard blogs about her fishing, conservation and family on MetalHeads, sea-run cutthroat Steward Shane Stewart tells it like it is at The Quite Pool, and McKenzie Steward Matt Stansberry and Nehalem Steward Rob Russell regularly contribute to The Oregon Fly Fishing Blog.

A good starting point for all these social media sites is this NFS website at www.nativefishsociety.org. Informed wild fish advocates make effective wild fish advocates. Get involved! Check it out online!



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