Strong Runs

Wild is the Future

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Missing in Oregon: Stock transfer policy

by **Bill Bakke**
NFS Executive Director

The transfer of locally adapted salmon from one watershed to another has a long history primarily perpetuated by government agencies responsible for salmon management. Willis Rich proved salmon home to their birth streams in 1939. He called it the "home stream theory" and said conservation of salmon means protecting each stock in each stream and the habitat they require, but the hatchery managers had a different theory.

Because hatcheries are modeled on an industrial premise used to make brown shoes and Ford pickups, they replaced Rich's science-based fact with the homogenous salmon theory. The efficient industrial manufacturing of salmon depended upon erasing any notion that salmon were distinct and locally adapted to their watersheds. All salmon are the same and interchangeable. This view point was recently on display when the Oregon Department of Fish and Wildlife attorney sat next to the property rights attorney before a federal magistrate protesting federal listing of coastal coho salmon.

The industrial view of salmon makes it possible to run a hatchery program based on production rather than conservation. The hatchery program depends upon having access to salmon from all streams for the production model to work. An example can be found endlessly repeated in each state, but one example from Idaho is probably enough. In the Idaho Fish and Game stock transfer policy it says, "propagate indigenous stocks" with the inevitable escape clause "whenever possible" to add a touch of flexibility to their conservation suggestion. Following this policy, Idaho Fish and Game imported sockeye salmon from Babine Lake, British Columbia for release in Red Fish Lake. The purpose, of course, was to boost sockeye production. Even though this transplant did not work, it has not discouraged other transplant schemes. The Red Fish Lake sockeye, the most unique sockeye population on the West Coast of North America, was eventually listed for protection under the ESA.

A group of scientists compiled an assessment of Columbia River salmon and steelhead stocks, a kind of status report, and also included the stock transfer policies adopted by Oregon, Washington and Idaho (Howell et al. 1985). The Oregon policy is merely a list of streams and their management designation of wild, hatchery or a combination. Some streams were managed with maximum flexibility. For example, Salmon River, a tributary of the Sandy River, is an important wild winter steelhead spawning and rearing stream so it was managed for wild winter steelhead. However, it was also managed for non-native hatchery summer steelhead. And even though the Sandy River had non-native Big Creek hatchery winter steelhead released into it, the operating assumption must have been that this hatchery winter steelhead would not enter the Salmon River and interbreed with wild winter steelhead or inflict ecological competition problems.

The Oregon stock transfer policy in 1985 was for the convenience of the hatchery program not wild steelhead conservation. It had no deceptive preamble like that used in Idaho or Washington. Oregon was much more straight forward in its approach.

But what is the Oregon Department of Fish and Wildlife doing now? I called the leader of the Conservation and Recovery program and he said that there is no stock transfer policy; it is done on a case by case basis. However, he assured me that the fish were checked for disease before release. And it was noted that fewer fish are transferred into streams then there use to be. So the ODFW is not over-regulating the use of hatcheries to protect wild steelhead and salmon in Oregon streams. Their own research points out that releasing fish from one stream into another is not a good idea and runs counter to the protection of locally adapted wild fish populations. This research dates back to 1939 and has been confirmed many times over since then, but the ODFW is more concerned about preserving a flexible hatchery policy than it is in conservation of wild steelhead and salmon.

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NFS Member Doug Kayser fishes the Molalla River Dec. 28 during the winter snow storm that saw the Portland-area blanketed in a foot of snow. While also a fly fishermen, Kayser enjoys catching and releasing Molalla River wild winter steelhead using a jig and bobber. Contrary to popular belief, many NFS members use other methods of catching fish than a fly rod.

Photo by Tom Derry

Salmon hatcheries: Past, present and future

by **Jim Lichatowich**
NFS Member

This report is to provide background information on Oregon's hatcheries in a non-technical format. The report was originally prepared for the Oregon Business Council in 2001 and is reprinted here with OBC's permission.

A video showing staff from the Fall Creek Hatchery (Alsea River, Oregon) clubbing salmon to death has stirred controversy about that practice and has raised broader questions regarding the role of hatcheries in salmon management. As a result of that incident, hatcheries, which have a long history of public support, but surprisingly little evaluation and accountability, are coming under increasing scrutiny. The controversy has also raised several questions and concerns about hatchery practices in general and the role of hatcheries in the recovery of depleted salmon populations. The purpose of this report is to provide background information on hatcheries in a non-technical format that will clarify some of the concerns and answer some of the questions.

The large number of hatcheries, built prior to 1980, are in greatest need of reform. The newer state and tribal programs are generally based on current science, although that science is still woefully inadequate. The newer and older programs do share one attribute in common—an unverified optimism that hatcheries can overcome the consequences of poor habitat stewardship.

In the late 19th century, the belief that humans should control the reproduction of economically important fishes and, that in doing so they would increase the abundance of salmon had strong intuitive appeal. The basis for that belief was found in agriculture.

Early proponents of artificial propagation of fishes compared hatcheries to farms. The comparison with farms gave hatcheries instant success by analogy. Agriculture had increased the production of important human foods so it was natural to conclude that fish farms (hatcheries) would increase the production of fishes. This success through association with agriculture was unfortunate because it removed the incentive to actually determine the performance of hatcheries.

Thirty-five years after the two French fishermen made their discovery (1841), hatcheries were propagating Pacific salmon and the U. S. Fish Commission was proclaiming that artificial propagation would make salmon so abundant that there would be no need to regulate harvest or protect habitat. Such hyperbole had no basis in science, but those who wanted to maintain high harvest rates or alter the habitat in salmon rivers accepted it as fact.

As a consequence, hatcheries were constructed and used as a substitute for habitat protection and harvest regulation. It is now generally recognized that accepting hatcheries in lieu of habitat and rational harvest was not an effective tradeoff. Artificial propagation was not able to maintain the abundance of salmon.

Oregon's hatchery program annually releases 74 million salmonids: 60.4 million salmon, 6.4 million steelhead and 7.6 million trout (ODFW 1998).

The analogy with farms was only half-correct. Humans could control the reproduction of salmon and increase the survival of juveniles while they were in the hatchery, but at some point the young salmon are released back to the river and ocean where they are on their own, beyond the protection of humans. This is an important and often overlooked dilemma.

For about 100 years research focused on one half of the mission—how to raise healthy fish in the hatchery. Recently, studies addressing the fate and effects of salmon once they are released from the hatchery have shown that domesticated stocks do not do well in the natural environment. However, the research effort in this area has been minimal.

Hatchery research has successfully developed facilities, procedures and methods that ensure the production of healthy fish in the hatchery environment. Part of that success was realized because hatchery practices often produced a population of domesticated salmon.

Domestication is selection for those traits that are beneficial in the hatchery environment. Such selection increases fitness in the hatchery, but it often decreases fitness in the natural environment.

Because domestication often reduces the fitness of the hatchery fish in the natural environment, hatchery practices should be designed so the artificially propagated salmon and steelhead mimic the attributes of wild fish. For that reason, it is not possible to use hatcheries to completely replace wild salmon. Our knowledge of the critical attributes of wild salmon is still too incomplete.

It is important to maintain the wild populations as models to study to determine what attributes must be preserved in the hatchery fish.

A heavy reliance on hatchery production carries with it additional risks:

• Catastrophic Loss. Because hatcheries raise fish in large numbers that are restricted to relatively small space they are vulnerable to catastrophic losses of biological (e.g. disease) or mechanical (e.g. pump failure) origin.

See **Hatcheries**, Page 8

Is SAFE for Salmon really safe for salmon?

Proposal claims clear benefits for wild salmonids entering the Columbia River but focuses on allocation not conservation

by **Russell Bassett,** NFS River Steward Coordinator
and
Bill Bakke, NFS Executive Director

Photo by Jon Bial, Magic Tailout Media LLC
A gillnetter retrieves his net in the Columbia River.

The 75th Oregon Legislative Assembly convened Jan. 12, and the decades old battle between commercial fishermen and sport anglers again comes to the forefront as at least three measures are designed to change how salmon are allocated in the lower Columbia River. One measure, SB 527, would allow the use of alternate fishing gear such as pound traps, fish wheels and seines. Another measure, SB 524, would completely prohibit taking salmon, steelhead or sturgeon in the Columbia River using any type of net. The third, SB 554, also known as SAFE for Salmon, would prohibit gillnet fishing on the lower Columbia River except in off-channel fishery enhancement areas like Youngs Bay.

The Native Fish Society typically does not get involved in the Columbia River allocation fight, because that battle really isn't about conservation; it's about allocation. However, just because we don't join the battle, doesn't mean we don't keep an eye on it. NFS has gotten involved when allocation threatens conservation, as when we stopped the proposal to triple the allowable by-catch of wild steelhead in the lower Columbia in order to increase the catch of hatchery Chinook in the gillnet fishery, or when we took a stand to have wild Coho listed under the Endangered Species Act.

Of the three Columbia River fishery measures to be decided this legislative session, the SAFE for Salmon proposal has received the most media attention. The authors assert that it will provide new economic benefits for lower Columbia River and coastal communities, reduce hatchery salmon straying on wild spawning grounds, eliminate by-catch of wild fish, provide more sport fishing off Washington and Oregon coasts, increase commercial salmon catches, increase the salmon sport catch, increase stability and reliability at the fish market, and reverse the decline of angling license revenue to ODFW/WDFW.

Those are certainly some incredible claims that make the proposal seem leaps and bounds better than the status quo. But are all those claims true? Sure SAFE for Salmon will likely benefit the Buoy 10 sport fishermen, but will SAFE for Salmon actually benefit wild, native fish?

NFS began researching this proposal when it first came to light, talking with the authors, proponents in the sport fishing industry, the Oregon Department of Fish and Wildlife and other members of the fish conservation community to determine if the SAFE proposal will actually have a conservation benefit or if it is just another allocation proposal dressed up as a conservation proposal.

The authors and proponents of this measure say there are clear conservation benefits for wild native fish.

"Less overall wild fish harvest, less by-catch mortality of wild fish, fewer strays on spawning grounds in major tributaries, and more manageability," said Jim Martin, a SAFE for Salmon author. "This proposal is better for commercial fishermen, sport fishermen and for the fish themselves."

While some members of the conservation community, including the Oregon Council of Trout Unlimited and Oregon Wild, joined the Northwest Sportfishing Industry Association in supporting SAFE for Salmon, NFS has yet to do so. We have several concerns with the proposal and resultant bill as they are currently written. Those concerns include:

The SAFE proposal does not address the impact of SAFE area fisheries and hatchery releases on wild fish in those same areas. While the authors speak of the success of the Youngs Bay fishery and refer to it as an example of how the SAFE proposal would work, they do not mention that Youngs Bay is now a sacrifice area for wild salmon and steelhead populations. Since the authors do not tell us where the additional SAFE areas are to be located, it is not possible to determine the potential impacts they will have on native, wild salmonids in nearby watersheds.

An unstated consequence of the SAFE proposal is the potential increase in hatchery funding for the purpose of increasing production of hatchery fish. The authors have told us that they see the SAFE proposal as a way to not only justify hatchery releases but to even increase them.

"Our assumption is that we might need to raise more funds to implement Safe for Salmon infrastructure but are not expecting to get increased funding for hatchery programs, except that Safe for Salmon policies may offer the opportunity to restore some of the Mitchell Act hatchery program that has been level funded in recent years, causing the mothballing of several facilities," Martin said. "We are not proposing any increased hatchery production to implement Safe for Salmon. However, we believe that this is a necessary step to show better utilization of current production, less waste of available hatchery fish, less strays and better economics/conservation. All of this will help stem the slow strangulation of the funding for Mitchell Act hatcheries and will help us keep the mitigation promises to fishermen/fishing communities."

Hatchery programs and harvest are factors contributing to the decline of wild salmonids in the Columbia River according to state and federal assessments. In addition, funding for federal and state hatchery programs is decreasing and increasing production will have a fiscal impact.

The authors say that salmon and steelhead were "decimated by habitat loss and hydropower mortality," but fail to include fishery management as another factor depleting wild salmon. In fact, one of the authors was harvest manager and chief of fisheries for Oregon and has admitted that salmon were overharvested on his watch. An 80-90 percent harvest rate and stocking hatchery fish in tributaries to compensate for overharvest was the program implemented. While the author did admit he was wrong and apologized for his actions, that does not change the fact that only two wild Coho runs remain in the lower Columbia River and they are found in two Oregon rivers, both of which, at the time, had hydropower dams on them.

"Wild salmon and steelhead recovery is advanced by selective fisheries, reduced by-catch of wild fish, and eliminating naturally spawning hatchery fish. Hatchery production and fisheries are two sides of the same coin and they must be restructured to recover wild salmon and steelhead listed under the ESA."

Yet another concern with the SAFE proposal is its silence on whether it will impede or support recovery of ESA-listed and unlisted wild salmonids in tributaries of the Columbia River. The impact of the SAFE proposal on wild spawner abundance is not discussed or evaluated.

Stray hatchery fish spawning naturally with wild salmonids in tributaries of the Columbia reduces the reproductive success, abundance and survival fitness of wild salmonids, many of which are listed as threatened species under the Endangered Species Act. This scientific fact based on decades of research, much of it by the Oregon Department of Fish and Wildlife, shows that increasing naturally spawning hatchery fish is inconsistent with state and federal law. The SAFE proposal may increase hatchery fish, yet it is impossible to harvest all of them in the sport and commercial fisheries, so even though the authors claim less hatchery strays, stray hatchery fish on the spawning grounds is a likely product of this proposal.

While the claims of the SAFE proposal are commendable, the authors provide no factual support for them and to our knowledge there has been no independent scientific or economic analysis provided to substantiate these claims. Lacking a factual basis the SAFE proposal is actually speculation and opinion. Given the crisis facing wild salmon and steelhead populations in the Columbia River and its tributaries, a proposal such as this needs factual support and independent expert review before it can be called a credible proposal. Otherwise, adoption of the SAFE proposal may increase the risk to wild salmonids it claims to protect.

Too many questions are left unanswered by this proposal. Those questions include:

How many hatchery fish will be moved off the tributaries to seed the SAFE areas? From which hatcheries? From which rivers? Will this proposal be used as an excuse to increase hatchery production and spend more money on hatcheries? How much will this proposal cost? Where will the funding come from? Where will the SAFE areas be? How many? Will the wild fish in these areas and the tributaries that flow into them be sacrificed on behalf of the fishery? Does this proposal actually have a conservation benefit or will it be a conservation wash, or even worse, an increase in hatchery funding, hatchery strays and harvest mortality of wild salmonids?

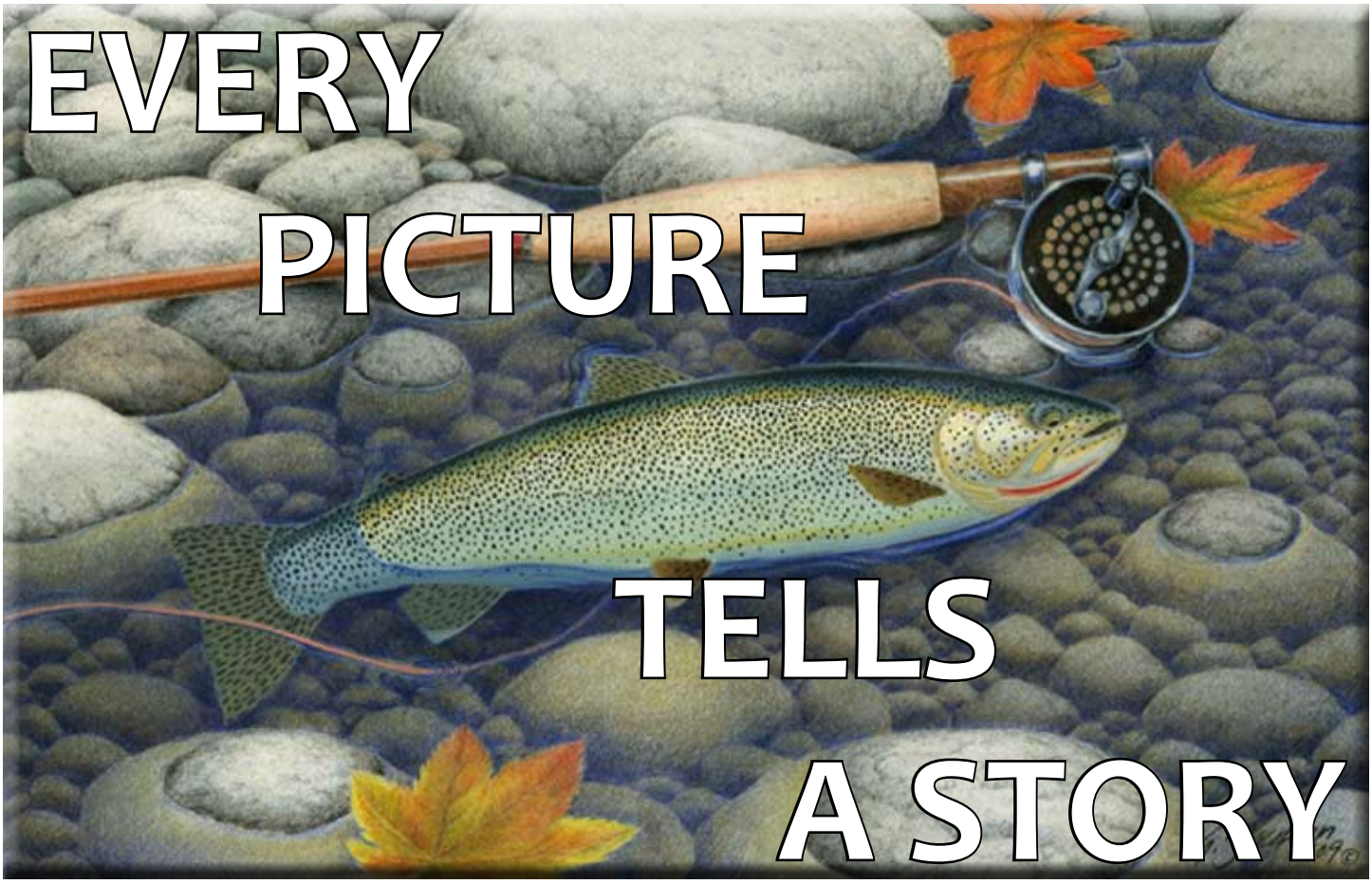
These are the main concerns NFS has with the SAFE for Salmon proposal as it is currently written, but we have not come out against it. Instead we are focusing our efforts on trying to ensure the proposal does have clear conservation benefits, including reducing hatchery strays, reducing fishing impacts to wild fish and meeting tributary spawner abundance goals on ESA-listed fish.

We also have some concerns with SB 524, which would completely ban gillnets. Just banning gillnets creates a conservation problem because the sport fishery will not be able to catch all the additional hatchery fish not caught in the commercial fishery, so more hatchery fish will make their way to the tributaries to breed with wild fish. Having more hatchery fish on the spawning grounds certainly doesn't solve the problem of wild salmon recovery.

The goal is to have more selective fisheries for salmon in the ocean and in the river, and SB 527 is a step in the right direction, although it is not a solution in itself as the alternatives would be in addition to the gillnet permits already issued and it does not address the ocean fishery.

"The larger problem is the by-catch of wild fall chinook and coho salmon in the ocean," Bakke concluded. "Harvest impacts in-river on wild salmon and steelhead also have an impact on spawner abundance. Wild salmon and steelhead recovery is advanced by selective fisheries, reduced by-catch of wild fish, and eliminating naturally spawning hatchery fish. Hatchery production and fisheries are two sides of the same coin and they must be restructured to recover wild salmon and steelhead listed under the ESA. There has been a deplorable lack of leadership within the federal and state agencies on this complex issue."

Are you passionate about your local watersheds and the native fish that live in them? Do you want to conserve, restore and protect wild fish in the waters that you love?
Do you want to ensure that wild salmon, steelhead and trout do not become extinct where you live? Are you concerned that fishery managers are not doing enough to protect and restore native, wild fish in your local watersheds?
Would you like to be more involved in restoring native fish runs in the Pacific Northwest?
If you answered yes to those questions, please consider joining the NFS team as a river steward or volunteer. Call Russell at 503-829-6211 or e-mail nativefish1@molalla.net for more information.



by **Shane Stewart**
NFS Sea-Run Cutthroat Trout Steward

"These trout are from 16 to 23 inches in length, precisely resemble our mountain or speckled trout in form and the position of their fins, but the specks on these are of a deep black instead of the red or gold of those common in the U' States. These are furnished with long teeth on the pallet and tongue and have generally a small dash of red on each behind the front ventral fins; the flesh is of a pale yellowish red, or when in good order, of rose red." -- Meriwether Lewis , from the Journals of the Lewis and Clark Expedition, June 13, 1805.

The original artwork above was done for me by wildlife artist Guy Jacobson. To most it is just a very nice pencil and acrylic painting of a trout but it's really a lot more than that and there is a story behind this fish.

This wild coastal cutthroat trout was hooked by me on the Kilchis River last October. He was "slurping" just down from me and I could not figure out what it was he was taking. I knew he had a little size to him but I was pretty sure my four weight bamboo could handle him. After trying at least a dozen different patterns, which this trout summarily ignored, I moved up stream so my fly would drift down into the slot where he was lying. That was the ticket because this 17" native fish hit my fly so hard it actually took the reel off my rod. It must have been hilarious to watch me try to fight this hot fish and replace my reel back onto my rod at the same time. I did it though and landed him after a spirited battle.

I didn't have my digital camera on me and of course a wild fish needs to be put back in the water very quickly so another angler did a quick measurement before I safely released this wonderful trout back into the river. While I may not have a picture of this fish I did have it forever etched into my memory and Guy did the rest.

This fish and the others I caught and released last season are definitely worth fighting for. It breaks my heart that coastal cutthroat trout like the one in the picture could be killed starting in 2009 but it seems like wild fish are always in someone's cross hairs for harvest. Why are wild trout like this so important? Very little is really known about their habits and whether some or maybe all try to migrate to saltwater. Just what do they do in salt water? How long do they stay in the estuaries or tidewater or do they spend more time in the ocean like their other larger salmonid cousins. Again not much data there for us to cling to, but the volumes of information we do not know should lead us to a new appreciation of these wonderful trout.

You that have actively pursued this trout with a fly know they will attack a fly with ferocity whether the fly be presented on the surface, sub-surface or deeply sunk.What I do know is what they mean to me. They mean a summer evening on my favorite coastal tributary where I can lose myself pursuing them. I seldom see others fishing for them and that is just fine with me. They also mean the wistful end of summer when the leviathans of west coast fresh water fishing, namely Chinook salmon, start their life journey up their rivers of birth. It signals the end of the cutthroat season on the North Coast and the beginning of the long months of fall and winter in the Pacific Northwest.

It's a time of year I dread and I find myself getting nostalgic at that time of year because it also marks the conclusion of the warm days of summer. So here I am about five or so months away from the Memorial Day opener.

See **Story**, Page 11

Deschutes River
Wild is the Future

THE PROBLEM: Stray steelhead from other hatcheries in the Columbia Basin are a dominant threat to Deschutes River wild steelhead. Over the last two decades, the wild run averaged 2,200 fish while the hatchery run averaged 11,000 fish. The number of hatchery steelhead on the spawning grounds reduces the reproductive success of wild steelhead equal to their proportion – therefore 30 percent hatchery strays reduce wild production by 30 percent.

THE SOLUTION: In January 2009, hatchery fish exclusion weirs were placed on Backoven and Buck Hollow creeks, two important Deschutes River steelhead spawning streams. A weir was put in on Trout Creek a few years ago excluding hatchery steelhead spawners from that important spawning stream. **Wild steelhead are now protected in all three of the Deschutes River's primary steelhead spawning streams.**

What
Hatchery Fish Exclusion Weirs
Where
Bakeoven and Buck Hollow Creeks
Deschutes River, Oregon
When
January 2009
Why
Recover Wild Deschutes River Steelhead

The recently constructed hatchery fish exclusion weirs at the mouths of Bakeoven (top) and Buck Hollow (left) will mean more wild steelhead in the Deschutes River.

BACKGROUND: ODFW and the U.S. Fish and Wildlife Service proposed constructing fish weirs on Bakeoven and Buck Hollow creeks and to evaluate the impact of hatchery fish on wild steelhead. Their proposal was rejected for BPA funding four years in a row even though it had been approved by independent scientific review and is consistent with the Fish and Wildlife Program of the Power Planning and Conservation Council and called for in the 2000 Columbia River Biological Opinion.

The problem was identified and fishery managers recognized the need to protect Deschutes wild steelhead from non-native hatchery strays. However, since the BPA would not fund it, the Native Fish Society (in cooperation with the Oregon Wildlife Heritage Foundation and ODFW) raised the necessary funds, and the weirs are now separating out hatchery fish.

This project to get more wild steelhead in the Deschutes would not have been possible without the dedicated support of NFS members who donated graciously to complete the project.

Hatcheries, From Page 3

• Loss of Diversity. To reduce cost hatcheries, like factories, employ economies of scale. This leads to reliance on a few large stocks instead of a diversity of stocks of various sizes. This is equivalent to "placing all our eggs in one basket" and increases the risk of major disruptions in production during adverse environmental conditions.

• Cost. The economic cost of replacing most or all natural salmon production with hatcheries would be prohibitive.

• Loss of Genetic Diversity. In agriculture, where we do have a reliance on artificial production of crops, we maintain at great expense seed banks that attempt to collect and preserve the genetic diversity of important food crops. Those seed banks have proven to be absolutely necessary to maintain production. There are no equivalent seed banks for salmon genetic diversity except in the thousands of populations that still inhabit rivers across the landscape. Heavy reliance on hatcheries could erode the genetic diversity of salmon and threaten their long-term productivity.

Our understanding of the fate of hatchery fish after release from the hatchery and the consequences of hatchery management on wild populations is still very incomplete. After 128 years of experience with salmon hatcheries, why is it that we know so little about the fate and effects of hatchery salmon in the natural environment? Why is it that we know so little about the performance of artificially propagated salmon outside the hatchery fence?

Part of the answer to that question comes from the way we evaluate hatcheries. Historically, hatchery managers assumed that the number of fish released from the hatchery was an adequate surrogate for the number of adults that return. Consequently performance was measured in terms of juvenile salmon released not the actual adult returns.

This is largely still the case. For example, 41 out of 51 hatchery programs reviewed in a recent audit by Oregon Department of Fish and Wildlife (ODFW) still measure success by the number of juveniles released. Only nine of those 51 programs used adult returns as a measure of performance (ODFW 1999). Success of half of the hatchery mission—the production of healthy juveniles—is evaluated, success of the other half of the hatchery mission—the increase of adult returns is not measured.

Evaluation of the effects of hatchery fish on wild salmon is not being done, except in a few of the newer programs. The older programs are still locked in the myth of success by analogy.

The failure to pay adequate attention to the second half of the hatchery mission has impeded the effective use of hatcheries and has inadvertently caused them to contribute to the depletion of wild salmon stocks. Recently three scientific panels reviewed hatchery programs and among the panels' conclusions there were ten common to all three.

1. Hatcheries have generally failed to meet their objectives.

2. Hatcheries have imparted adverse effects on natural populations.

3. Managers have failed to evaluate hatchery programs.

4. Hatchery production was based on untested assumptions.

5. Supplementation should be linked with habitat improvements.

6. Genetic considerations have to be included in hatchery programs.

7. More research on experimental approaches is required.

8. Stock transfers and introduction of nonnative species should be discounted.

9. Artificial production should have a new role in fisheries management.

10. Hatcheries should be used as temporary refuges, rather than for long-term production.

Clearly, this list of conclusions strongly suggests the need for hatchery reform.

At this point it is appropriate to visit the subject of hatchery broodstocks, since it was the broodstock that was being killed in the Alsea Hatchery incident. Historically, little attention was paid to broodstocks, beyond the need to obtain the number of eggs required to fill the hatchery. Where those eggs came from was of little concern. Salmon eggs were freely moved between rivers and hatcheries. Until the 1940s, it was common practice to place a barrier across the stream below the hatchery and block the run of salmon. All of the fish were captured and the eggs taken.

The original attributes of salmon populations used as hatchery broodstocks were often altered to make them conform to the hatchery environment. For example, one common change was a shift to an earlier time of spawning. To ensure the hatchery filled its quota of eggs, all the eggs from the earliest maturing fish were collected. This selection for early maturation eventually led to hatchery broodstocks that reached peak spawning several weeks before their wild counterparts. Then when those early maturing fish strayed onto natural spawning grounds they were out of synch with the natural flow patterns and suffered high mortality.

Correcting the effects of past practices on hatchery broodstocks should be a high priority.

Hatcheries consume a significant part of the salmon management and restoration budget. Given the status of the state's salmon populations and the hatchery program's track record, it's foolish to be satisfied with the status quo operation and evaluation of artificial propagation programs.

Five general purposes for hatchery programs have been identified: Mitigation, harvest augmentation, supplementation, restoration, and conservation.

Mitigation hatcheries attempt to replace natural production lost because of habitat degradation. In this century, most salmon hatcheries were built to mitigate for habitat that has been blocked or degraded.

The goal of augmentation hatcheries is to increase sport and/or commercial harvest opportunities. This is probably the oldest use of artificial propagation.

Supplementation hatcheries attempt to increase natural production. The use of supplementation assumes that the problem that caused reduced production in the target stock has been corrected and that the natural habitat is capable of producing more fish. Supplementation projects should be temporary, terminating after natural production

has increased.

Restoration hatcheries attempt to reestablish salmon or steelhead populations in habitat from which they were previously extirpated.

The conservation hatchery is the newest purpose for artificial propagation. Its goal is to prevent extinction of threatened or endangered stocks. The concept of a conservation hatchery is new and its scope and constraints are still being developed. Hatchery programs with conservation objectives often employ captive broodstock technology.

The primary purposes of most of Oregon's hatcheries are mitigation (17 hatcheries) and augmentation (13 hatcheries) (ODFW 1999). Two hatcheries have research as their primary purpose. Conservation and supplementation are often included as a secondary purpose of mitigation or augmentation hatcheries. In Oregon, restoration is considered part of mitigation.

Hatcheries were and in many cases continue to be operated as though they were independent of the ecosystems their fish are released into. Carrying capacities of the river and estuary, natural fluctuations in climate and productivity (fluctuating carrying capacities), interactions with wild fish of the same or different species, and the effects of domestication on the ability of the hatchery fish to survive in the wild are generally ignored.

What are some of the consequences of the failure to integrate natural and hatchery production?

• The transfer of hatchery fish among watersheds was historically a pervasive hatchery practice that persists today, but to a lesser extent. Such transfers are a direct result of the failure to consider the ecosystem attributes and integrate the hatchery into the watershed.

• Poor survival of hatchery fish that are highly susceptible to a disease or parasite in the watershed they are released into is a major problem. However, it is not the only problem that can result from a lack of an ecosystem perspective. Some of the hatchery fish may survive even though they are highly susceptible to a parasite or disease. If they survive to the adult stage and return to the river and spawn with the native population, the result can be a lowering of the resistance of the native fish to the pathogen.

• Domestication of the hatchery stock often includes a shift to an earlier time of spawning compared to the wild stock in the same river. In fact, streams planted with the early spawning, hatchery coho in an attempt to supplement natural production actually showed reduced natural production.

• In 1991 the National Marine Fisheries Service (NMFS) declared that the wild lower

Columbia River coho salmon did not exist and was not eligible for listing under the federal ESA. In a later analysis of the situation, NMFS biologists concluded that hatchery operations were at least partially responsible for the loss of the wild coho salmon in the lower Columbia River. One of the factors they identified was the over stocking of the streams with hatchery fry, i.e., planting more fry than the carrying capacity of the stream. As long as hatchery evaluations are based on juveniles released and as long as the attributes of the ecosystem are not fully incorporated into hatchery programs, the conditions that created the problems still exist. In fact, more problems may exist, but are not identified because of the lack of adequate evaluation.

Hatcheries are here to stay. Whether or not the original goal of hatcheries was valid, we did trade habitat for artificial propagation and in many rivers that habitat will not be restored to even a fraction of its original productivity. In many of those systems, natural salmon production will need to be augmented with hatcheries. This is an important responsibility and it cannot be taken lightly, especially today when artificial propagation is also expected to help bring about the recovery of ESA listed ESUs. How can hatchery programs be reformed to have a better chance of meeting expectations?

Many of the suggestions for future roles for hatcheries (i.e., conservation hatcheries) cannot be achieved without significant reforms in the planning, implementation and administration of hatchery programs.

In general questions and criticisms intended to improve hatchery success are first marginalized through labels such as "hatchery bashing," then ignored.

Hatchery operations cannot be treated as though they are independent of the ecosystem. Artificial propagation and natural production must be integrated, and this is being attempted in many of the newer programs. The first step to the integration of older hatchery programs is a change in the historical approaches to evaluation. Meaningful evaluation will be expensive, but not as expensive as maintaining ineffective programs or maintaining programs that are reducing natural production.

Intensive research should be initiated on the process of domestication and its effects upon both the survival of hatchery fish that spawn in the wild and the effects on wild populations that hatchery fish interact with. One of the biggest failures of the hatchery program has been the fact that this need has been recognized for decades, but there is still woefully inadequate information on it.

To integrate natural and artificial production in a watershed, the hatchery operation must first be integrated into the ecosystem. A step in this direction would be to replace the vision of hatcheries as farms with the vision of hatcheries as artificial tributaries to a larger ecosystem. Production in the artificial tributary must be consistent with the whole system and especially the ecological attributes both upstream and downstream from the hatchery.

Carrying capacities of the stream and estuary are important attributes of the ecosystem that must be considered in the design and implementation of artificial propagation programs. Carrying capacity has been generally ignored. Carrying capacities raise several concerns in the implementation of hatchery programs. Where there is more than one hatchery in a basin (e. g. the Columbia River), production from all facilities must be coordinated and taken into account relative to the stream's capacity.

Because hatchery fish survive in the ocean at about half that of wild salmon, the priority during periods of low ocean productivity should be to fill the limited capacity with the higher surviving wild salmon.

ODFW needs to develop a plan for reform that includes: Specific, measurable objectives for each hatchery program; a monitoring and evaluation program that 1) tracks progress toward meeting objectives, 2) addresses the uncertainties regarding the fate and effects of salmon after release from the hatchery, and 3) specific steps it will take to make hatchery operations consistent with the attributes of the ecosystem.

If hatcheries are to justify their use of a large portion of the salmon management and recovery budget and if they are to achieve success consistent with that expenditure, they will have to make fundamental changes. Those changes will require a shift from a defensive attachment to the status quo. Hatchery programs will have to become more reflexive, able to openly accept and respond positively to questions and criticisms based on the latest science. In general the newer programs are making this change, although even in those cases, more fundamental research is needed. The older programs appear to be locked in the historical status quo.

THERE'S NO PLACE LIKE

HOMEWATERS

Don't miss Portland's best auction and banquet

by **Fran Taylor**
NFS Administrative Assistant

The Native Fish Society's 13th Annual Auction & Banquet, HOMEWATERS, will take place on Saturday, March 21, beginning at 5:15 p.m. at Montgomery Park in Portland, OR. With this gala event just around the corner, your NFS office is in full swing preparing for a fun-filled evening of good cheer, great conversation, and fabulous deals on incredible auction items.

Many businesses are supporting the Auction and their home waters through donations of an amazing assortment of merchandise, local and beyond trips, and timeless experiences. You may choose to bid on a week at the Silver Hilton on the Babine, two nights at a Bed & Breakfast on the world famous Kispiox River, an Alaskan Wilderness fishing experience, fishing gear, trips on local rivers including the Deschutes and Clackamas, Oregon wines, dinners at some of our great northwest restaurants, weekends away, or even a guided trip at the Oregon Zoo. Items will be separated into Silent, Super-Silent, and Live Auction giving everyone an opportunity to go away with a one-of-kind item and support native fish.

This year's event features hosted wine and beer throughout the evening and a scrumptious dinner prepared by Food In Bloom catering. Guests will begin this gastronomical delight with a salad of hearts of romaine lettuce with dijon vinaigrette, gruyere, chive baton, and campagnolo croutons. The main course, Chicken Chausseur, features chicken with mushrooms and shallots in a cognac reduction served over butter whipped yukon gold potatoes and roasted spring vegetables. All of this will be followed by a dessert of assorted miniature designer cupcakes. A meal sure to please the most discerning palate. Parking is free at Montgomery Park and it is even on the MAX line.

Living legend Frank Moore is this year's guest speaker. The man most associated with the strong wild runs of the North Umpqua will tell his story of fishing and protecting his cherished home water.

We are pleased to have auctioneer Johnna Wells of Benefit Auctions 360 with us again this year. Johnna, an award winning auctioneer, was the youngest woman ever to win the International Auctioneer Championship. Those who attended last year's Auction will remember Johnna's ability to engage the audience and keep them on the edge of their seats.

Tickets for the Auction & Banquet are only $75, including all you can eat and drink; an incredible deal for an exciting evening. Tickets may be purchased by calling the Native Fish Society or signing up online at www.nativefishsociety.org Gather your favorite friends and family to share the experience.

The legendary Big Fish Ticket is back this year. Buy a Big Fish Ticket for $100 and you could win your choice of any auction item you wish before the bidding starts. You may purchase as many tickets as you like, but remember: ONLY 100 tickets are available. Tickets may be purchased the evening of the auction or by calling Fran at (503) 829-6202 or email fran@molalla.net after March 10.

The auction could not happen without Auction Chair Tom Derry who, with his great organizational skills and friendly personality along with many eager volunteers, come together to produce the best conservation auction in the Portland area.

According to NFS member and auction volunteer Jeff Powell, "this auction is a great place to meet like-minded people who are connected in philosophy. It is the friendliest and best-run auction for an event of its size."

The Annual Auction is the Native Fish Society's main fundraising event. It supports the scientifically-based advocacy program, growing river steward program, and extensive public information program. Money raised at the Auction funds these programs and benefits native fish, not to mention your steelhead mojo.

Story, From Page 6

Why are these trout so important beyond their appeal as game fish? These trout and especially the coastal sub species *oncorhynchus clarkii clarkii* are an indicator of the overall health of the watersheds they are native to.

Of course, I do not have a degree as a fish biologist but this scenario has proven to be true on the north Oregon coastal streams for all the years I have been pursuing them with a fly. When the cutthroat populations in these streams are down, so too will be the other salmonid species in that watershed and this is true currently in the coastal rivers that are home to cutthroat trout.

Cutthroat trout are the one species of trout that are prevalent through the western U.S. and is not near as likely to be found in a wild state east of the Rocky Mountains. Several sub species are, unfortunately, now extinct but at one time cutthroat trout ranged as far south as the Pecos and Rio Grande rivers in southwest Texas.

Cutthroat trout are most prone to man's intrusion into their habitat. Their spawning gravel is silted over by bad logging practices and the woody structure that provides them sanctuary has been either purposely removed or washed away in winter floods. Coastal cutthroat trout do not adapt to being removed and relocated in other waters and perhaps that is why we do not see them in the eastern US.

While some elitist anglers might show them a certain amount of disdain because of their aggressiveness while casting flies at the more "desirable" species of rainbow or brown trout, I have a special affection for cutthroat trout.

Cutthroat trout are important because we seem to have overlooked them for so many years that now, as their numbers decline, we cannot ignore or overlook them anymore.

We cannot easily dismiss them as unimportant and non-vital. If we do that with enough coldwater fisheries, we will one day wonder what happened to them.

I will forever remember this trout of my dreams, and hope that coastal cutthroat trout will be so abundant in the future that they will never be only a memory of a long-ago fishing trip.

In order to keep NFS members informed and active in fish conservation, we have starting using html e-mails for correspondence with the membership to include Action Alerts and notices of upcoming events. In order to receive this benefit of your membership please be sure to let us know when your e-mail address changes, and also please be sure to unblock NFS e-mails from your span filter. THANK YOU FOR ALL YOU DO FOR NATIVE FISH!

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