

NWIFC News

Northwest Indian Fisheries Commission

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MPAs Only One Tool

By Billy Frank Jr.
NWIFC Chairman



You’ve probably been hearing a lot about the health of our oceans these days. Most of the news isn’t good. Declining sea life, pollution, overharvest of marine resources – the list goes on.

According to the recent Pew Ocean Commission report, pollution and poor natural resource management are the main causes for the trouble our oceans are in. This private group’s assessment will be followed later this year by a report from the U.S. Commission on Oceans Policy. This

federal commission is charged with developing findings and making recommendations to the president and Congress for a coordinated and comprehensive national ocean policy. We suspect their findings will be similar to the Pew report.

One idea that’s getting a lot of attention is the creation of more Marine Protected Areas (MPAs). Whether they’re called protected areas, reserves or sanctuaries, the idea is usually the same: set aside sections of the ocean, close them to all fishing, and wait for the area to “recover.”

To a lot of folks, MPAs are an easy answer to a complex problem. But there are no more easy answers. We used those up a long time ago. Effective management requires more than simply locking up an area and throwing away the key.

One thing’s for certain, a blanket approach to creation of MPAs won’t work. MPAs are a tool, one of many available to better manage and conserve ocean resources. But they must be tailored to specific areas to address differences in habitat, currents, water conditions and other factors. If onshore pollution is damaging a particular part of Puget Sound, turning that spot into an MPA and closing it to fishing won’t do much good if the root cause of the problem isn’t addressed.

I heard about one spot off the West Coast where folks wanted to improve rockfish populations, so they set up a reserve and closed it to fishing. Years went by, but the population didn’t grow. That’s because the habitat set aside was great for adult rockfish, but not so good for young rockfish. Adult rockfish were gobbling up young rockfish at the first opportunity. Despite good intentions, the reserve did nothing to enhance rockfish populations.

Fishing closures aren’t a new management tool. We’ve long used them to help rebuild fish stocks by applying closures in specific areas, for specific lengths of time to reach specific goals.

What are we trying to achieve? How long does an area need to be set aside? Are we protecting the right area in the right way? These are some of the questions that must be answered before any place is considered for MPA status. We must all work together to identify problems and possible remedies. We must remember that creation of an MPA is not a goal in itself, but might be the means to reach a goal.

MPAs could end up being as dangerous to our oceans as all of the pollution and poor management practices combined. Passive management is cheap and simple. It’s easy to lock up an area for protection and feel good about doing that, while continuing to ignore most of the factors that created the problem in the first place.

We need to work together, using the best available science to develop recovery plans that may use MPAs – or any other tools at our disposal – to address the problems our oceans face. We need to do the hard work up front. The easy path leads only to fragmented ocean habitat and islands of fish in a dead sea.

Northwest Indian Fisheries Commission News

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NWIFC Member Tribes

Jamestown S’Klallam	360-683-1109
Lower Elwha Klallam	360-452-8471
Lummi	360-384-2210
Makah	360-645-2205
Muckleshoot	253-939-3311
Nisqually	360-456-5221
Nooksack	360-592-5176
Port Gamble S’Klallam ..	360-297-2646
Puyallup	253-597-6200
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Quinault	360-276-8211
Sauk-Suiattle	360-436-0132
Skokomish	360-426-4232
Squaxin Island	360-426-9781
Stillaguamish	360-652-7362
Suquamish	360-598-3311
Swinomish	360-466-3163
Tulalip	360-651-4000
Upper Skagit	360-856-5501

NWIFC Executive Director: Jim Anderson; NWIFC News Staff: Tony Meyer, Manager, Information and Education Services Division; Emmett O’Connell, South Puget Sound Information Officer (IO); Darren Friedel, Strait/Hood Canal IO; Jeff Shaw, North Sound IO; Debbie Preston, Coastal IO; and Sheila McCloud, Editorial Assistant.

For more information: NWIFC Information Services in Olympia: (360) 438-1180; Mount Vernon: (360) 424-8226; Kingston: (360) 297-6546; or Forks: (360) 374-5501.

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On The Cover: Makah fisheries technician Gwen Swan gathers a sample of blue mussels on Sooes Beach in Neah Bay to be tested for naturally occurring harmful toxins. The testing is part of the Makah tribal water quality program. (See story on page 3)

Photo: D. Preston

Water Quality Program Protects Makah Health

Gwen Swan knows the link between water quality and the dinner table better than most.

The Makah tribal member eats seafood nearly every day. She is also a fisheries technician whose duties include harvesting mussels and clams in and around Neah Bay to be tested for biotoxins such as Paralytic Shellfish Poisoning (PSP) and Amnesic Shellfish Poisoning (ASP).

PSP and ASP are both naturally occurring toxins. PSP can kill a person in as little as two hours by paralyzing the chest muscles used for breathing. ASP can cause vomiting and diarrhea within 24 hours and neurological damage in the long term. The testing of the mussels and clams is a key part of the tribe's water quality program.

"I remember when I was a girl that we ate everything we're seeing on this rock today," said Swan as she gathered mussels for PSP testing. Swan pointed to green sea anemones, remembering that tribal members would remove the leathery boot before boiling the flower-like animals to eat.

"To protect these resources, it is critical that the tribe have the capacity to monitor and regulate the quality of marine waters regularly flowing within intertidal areas and streams that drain into the marine areas," said David Lawes, water quality resource specialist for the Makah Tribe. As part of ensuring the health of the Makah people, the tribe has established water quality standards that are currently being reviewed by the federal Environmental Protection Agency.

The tribe surveys more than 50 sites as part of their water quality monitoring plan. Technicians track levels of a variety of stream health indicators including fecal coliform (human and animal waste), dissolved oxygen and temperature.

"The biological testing of shellfish, for example, is one of the most important aspects of our water quality program," said Lawes.

Developing a baseline of water quality data enables the tribe to better assess impacts of various activities such as logging on the watersheds as needed. Aquatic life is the most sensitive water quality indicator. The tribe's monitoring provides an early warning system if water quality becomes degraded.

"When you have a population that relies so heavily on life in the sea, lakes and rivers for subsistence, it's really important that you know the health of the whole system," said Lawes. — D. Preston



Carol Claplanahoo, Makah water quality technician, gathers water quality data from the Ozette River. Photo: D. Preston

Five-Year Deal Near On Neah Bay Tugboat

The Makah Tribe appears to have a longer-term commitment from the State of Washington to prevent oil spills by stationing a tug in Neah Bay.

A tug has been stationed in Neah Bay from late fall to early spring since 1998, but has annually faced possible funding cuts due to budget shortfalls.

Both the Senate and House budgets have earmarked 25 cents from each car registration fee to support the tug for the next five years. The Senate measure has already passed.

"We're happy with the commitment from the state and we're hoping to access some federal funding so the tug is funded all year, not just during the stormy months," said Nathan Tyler, Makah tribal chair.

Sen. Patty Murray said \$1.6 million was allocated to the U.S. Coast Guard for oil spill prevention, but it hasn't been made clear whether that will be used to round out funding for the tug.

Tyler said ardent lobbying has been necessary to keep shipping interests from convincing the legislature to cut funding for the tug. Commercial shippers have advocated the "tug of opportunity" system that requires any tug working near a ship in distress to come to its aid. The tribe and others counter that with more than 10,000 commercial passages in the Strait of Juan de Fuca every day, it is impossible to expect there will be a tug available to handle all emergencies or that a "tug of opportunity" will be of the right size to assist.

The tug has been called on more than 20 times to assist ships. "All the saves they've made already prove the necessity of the tug and the benefit," said Tyler.

For the tribe, the tug provides a measure of prevention against oil spills that threaten depressed fish stocks and other marine resources the tribe depends on for subsistence. — D. Preston



Tribal members utilize most of what the sea has to offer, including these green sea anemones and blue mussels. Photo: D. Preston

Tribes Work To Restore Native Olympia

Standing in mud and nearly hip-deep in water, Eric Sparkman pulls a large oyster shell from a saltwater pond and begins to take measurements. It's not the dimensions of the shell Sparkman is looking to note; it's the size of what's living on the shell he's after.

"There are several Olympia oysters living on this one – five or six – and they're all pretty small," said Sparkman, shellfish biologist for the Skokomish Tribe. "But they are alive and they are slowly growing, and that's really what counts."

Outfitted in hip waders, Sparkman and Teresa Barron, management biologist for the tribe, spend the afternoon checking two of the five sites near the Skokomish River where Olympia oysters have been planted. The pair counts and measures the juvenile oysters, checking the progress of a project aimed at reintroducing the native species back to the area.

Once abundant on Puget Sound beaches, Olympia oysters have all but disappeared in the region. Most shellfish connoisseurs consider the Olympia oyster, which is usually less than two inches wide and two inches long, a delicacy. That is partly the reason the oysters were nearly harvested to extinction more than a century ago.

To satisfy a voracious demand for shellfish, Olympia oysters were harvested in great numbers in the mid-1800s. Most of the oysters were shipped to San Francisco during California's booming gold rush years. By 1880, abundant Olympia oyster stocks throughout the Puget Sound were nearly wiped out. As the Olympia oyster began to disappear, the shellfish industry began importing Japanese Pacific oysters to the region. The larger Pacific oysters quickly took over cultivated beds once home to thriving Olympia oysters.

But overharvest and displacement were only partly to blame. Pollution from western Washington industries, particularly pulp and paper mills, and the loss



Eric Sparkman, shellfish biologist with the Skokomish Tribe, measures Olympia oysters in the Hood Canal. *Photo: D. Friedel*

of habitat to development also played significant roles in the Olympia oysters' demise.

Indian tribes have always valued the Olympia, which is western Washington's only native oyster. The Olympia was not

only an important source of food for the coastal Indians in the area, but the oyster also was a valuable trading item.

Today, the Skokomish, Suquamish, Squaxin and Jamestown S'Klallam tribes, along with the Lummi Nation are

Olympia Oyster Fast Facts

- Scientific name: *Ostrea lurida*, which means "pale oyster."
- The Olympia oyster is small; the shell is approximately the size of a 50 cent piece. They also grow slowly, reaching their full size in about three years.
- Legend has it that the "Hangtown Fry" was created when a condemned man in San Francisco requested Olympia oysters and eggs – the two most expensive foods in town – for his last meal.
- Olympia oysters range from southeast Alaska to the Baja Peninsula in Mexico, but historically were most concentrated in coastal Washington.
- The commercial harvest of Olympias started in the 1850s, when 10,000 bushels were harvested annually, and peaked in 1890, with 130,00 bushels.
- The Olympia oyster is Washington's only native oyster.

Olympia Oysters



working with others to help bring Olympia oysters back to the region's beaches. Others involved in the restoration project include the Northwest Indian Fisheries Commission, the Puget Sound Restoration Fund, Washington Department of Fish and Wildlife, Washington Department of Natural Resources and Taylor Shellfish Farms.

"This project is a unique community venture," Sparkman said. "A lot of different groups have been brought together for a common goal: to re-establish the native Olympia oyster."

The brood oysters for the Skokomish sites were collected from beaches along Hood Canal and spawned at a state shellfish laboratory in 2002. The seed – attached to Pacific oyster shells – was placed in the growing plots throughout the Skokomish River estuary. At some sites, shells, bearing the young oysters, are attached to a rope stretched between two posts. The rope keeps the oysters in ideal growing conditions – above the muddy bottom but below the water.

growing in Along with the Skokomish sites, Olympia oysters also are being cultivated at Budd Inlet and Squaxin Island near Olympia and Liberty Bay and Brownsville near Poulsbo. If the project is successful at these sites, recreational harvests of Olympias – currently prohibited – could take place in a few years.

"The intent is to rebuild stocks of naturally spawning populations of Olympia oysters on historic grounds in Puget Sound and the Washington coast," said Dave Fyfe, Northwest Indian Fisheries Commission shellfish biologist. "It's a lengthy process, but eventually we hope to see good survival and good growth of these oysters, to the point that they are not only reproducing but repopulating an area." – *D. Friedel*

Squaxin Island Tribe Battles Japanese Oyster Drill Invader

When Pacific oysters were introduced into Puget Sound in the 1930s, they brought with them an unwanted hitchhiker: the Japanese oyster drill, which eats oysters after boring through their shells. The snail-like invader devastated struggling Olympia oyster populations upon its arrival, and even today is a major barrier to the re-establishment of the state's only native oyster.



The Squaxin Island Tribe is now exploring ways to exterminate Japanese oyster drills in the southern Puget Sound. "The biggest obstacle we've faced trying to re-establish Olympia oysters has been drills," said Brian Allen, shellfish biologist with the Squaxin Island Tribe. "We saw a huge jump in the oyster drill population on Squaxin Island soon after we planted Olympia oyster seed a few years ago. Japanese oyster drills, because they have adapted to boring through the thicker shell of the Pacific oyster, have a much easier time with the smaller Olympias."

Oyster drills. *Photo: E. O'Connell*

"Olympia oysters took advantage of our pristine bays and beaches for centuries, growing and evolving into an important food source," said Jim Peters, natural resources director for the tribe. "With human influence on the Olympia's habitat, they have almost disappeared. It is our job to restore them to their historic abundance."

One of the options the tribe is considering is using the oyster drill's own life history against it. Tribal crews would collect the drills during their breeding stage, when they are most vulnerable. "Oyster drills congregate from early spring to early summer to spawn," said Allen. "This makes it fairly easy to go out to the beach and simply remove them from the oyster beds. We just need to be out on the island when they're coming together so we can get as many as possible."

Also, since the drills can't themselves migrate long distances, another way to control their spread is to set up quarantine or "drill free" zones. All oysters brought into a "drill free" zone would be checked to make sure they don't carry drills. Most of the drill free zones in Washington are in Hood Canal. "Hopefully, Squaxin Island can become one of the few drill free zones in southern Puget Sound," said Allen. "Having an area without drills would be a big advantage in restoring Olympia oyster populations."

The Squaxin Island Tribe has been collaborating with the Puget Sound Restoration Fund for the last few years to restore Olympia oysters on Squaxin Island. The tribe and the non-profit have spread thousands of young oysters on the island.

"The drills came to Puget Sound on the shells of Pacific oysters and the kelp used to pack them," said Allen. "The Japanese drills are more voracious than our native drill, which feed mostly on barnacles."

"Olympia oysters have always been a central part of our culture and economy," said Peters. "We are working to restore Olympia oysters not just of the sake of restoring a scarce species, but also for the sake of restoring an important part of our lives." – *E. O'Connell*

Tulalips Restoring Old Military Site

It's been owned by the military, by the Tulalip Tribes, and then leased by a major corporation. Known commonly as the former Boeing site, it's also been the Tulalip Storage Depot and Military Reservation.

But thanks to an environmental restoration project undertaken by the Tulalips, in a few years you'll be able to simply call this place on their reservation "high-quality fish and wildlife habitat."

The tribes' work is broad in scope, aiming to open inaccessible habitat and upgrade an ecosystem that has taken a beating for decades.

"We're trying to create a stream system and wetland area that provides functional and useful habitat for salmon," said Kurt Nelson, fish and wildlife resources scientist for the Tulalip Tribes.

The site has a colorful history. Before it was leased to Boeing, the U.S. Department of Defense used it for ammunition testing and storage during the 1940s and 1950s, in the process draining the surrounding wetlands and creating a 1,500-acre grid of ditches and roads.

These human alterations were fine for the Department of Defense and for Boeing, but far from ideal for the salmon, trout and wildlife that relied on the area. The ditches, bunkers and roads stopped fish from accessing significant portions of



The Tulalip Tribes are restoring a former military ammunition facility which has also been used by the Boeing Corporation. *Photo: J. Shaw*

their historic habitat. Much of the industrial and military activity, some of it classified, left the soil contaminated and the water fouled. While soil remediation work has been completed, efforts to remove pollution in the water table are ongoing.

"We know salmon and cutthroat trout are using these channels," said Nelson. "But their success in spawning has been limited by the degraded habitat. Improving the habitat that exists and opening up new channels will give the area's fish populations a real boost."

Tulalip's ambitious slate of habitat improvements already show some results.

Road construction left the site full of blocked habitat, including a host of culverts that were partial or complete barriers to fish passage. Already, the tribes' culvert replacement efforts during the past year have opened up about one mile of habitat. Over the next two to three years, Tulalip crews will create and enhance about 10 acres of wetland and one-half mile of stream channel. Additionally, the tribes will set aside some 700 acres on the west side of the Boeing site as a forest reserve.

To re-establish a wetland system, Tulalip staff will dismantle roads and modify ditches in order to connect spring tributaries, streams and outlying portions of wetland. Targeted planting of vegetation will help create a diverse – though human-made – ecosystem.

"By increasing the biodiversity in the area, we can improve the habitat here – not just for fish, but for wildlife species as well," said Nelson.

The project could reach completion within three years, though Tulalip crews will continue environmental monitoring well after the last ditch has been demolished and the last acre of wetland restored. – *J. Shaw*



Kurt Nelson, fish and wildlife resources scientist for the Tulalip Tribes, examines freshwater lamprey spawning in a stream at the former Boeing site. *Photo: J. Shaw*

Tribes, State Working To Fill Gaps In Groundfish Data

In an effort to preserve groundfish species such as blackcod and yellowtail rockfish for sustained harvest off the Olympic coast, treaty tribes and the Washington Department of Fish and Wildlife (WDFW) are working together to fill significant data gaps on groundfish populations.

The tribes and WDFW recently hired a scientific technician to improve knowledge of what species are caught, where, and their age and distribution. Brandon Bryant samples and identifies species of fish landed by Indian and non-Indian fishermen at Neah Bay and La Push. In Neah Bay, he also goes out to sea with tribal fishermen to monitor catches and log harvests of fish.

It's hoped this monitoring will help remedy the information shortages that have resulted in the need for restrictive fisheries coastwide.

"It's been clear for some time that we need a good accounting of the kinds of fish being brought to the dock and where they are encountered," said Steve Joner, senior biologist for the Makah Tribe. "For a while there, we had a part-time sampler and the state had a part-time sampler, and neither one of us had enough work or money for them, so we decided it would be better to pool our resources."

Bryant's chief task is to biologically sample a variety of species that come in to port. He removes the fish ear bones, or otoliths, and records size, weights and sex of the species. This information is critical to establishing information about the status of regional stocks.

"Scientific models and limited observations don't get to the nitty gritty of the makeup of catch like sampling actual fishing boats does," said Joner. "These fisheries are complex. There are dozens of species, not just one or two species of concern like you have with salmon fisheries."

To the casual observer, many of the species of fish Bryant identifies look the

same. But subtle differences in fins and spotting give Bryant clues as to what species he has before him. Each week, Bryant turns in a market report that quantifies the kinds of fish that have been landed and the price given. This information improves knowledge of what is actually caught by fishermen and allows fisheries managers to make adjustments in-season to trip limits for fishermen.

"This is the kind of regional focus we need," said Mel Moon, natural resources director for the Quileute Tribe. "It's what we've been trying to say all along. Tribes need to be involved on the assessment end as co-managers."

Tribes and the state see the need to continue the sampling for years to come. "We can't do this like a doctor treating a



Brandon Bryant, observer and sampler, removes the ear bone of some of the groundfish species brought to shore in Neah Bay. Photo: D. Preston

sick patient only in the time of crisis. We need to do this indefinitely – for years to come," said Joner.

– D. Preston

Generations



Five Upper Skagit tribal members paddle a canoe on Baker Lake, in the shadow of Mount Baker. The area has always been of cultural importance to the Upper Skagit, whose bands traditionally used the lake and valley for fishing territory and cultural purposes. Photo: Courtesy Upper Skagit Tribe

Estuaries

Tribes Work To Protect, Restore And Better Understand These Cradles Of The Salmon Resource

On The Skagit River System



At Brown Slough, Skagit System Cooperative Director of Restoration Steve Hinton shows a map of estuarine areas in Skagit County. *Photo: J. Shaw*

At Brown Slough, Skagit System Cooperative Director of Restoration Steve Hinton shows a map of estuarine areas in Skagit County. *Photo: J. Shaw*

Unfortunately, due to the diking and draining of the Skagit River delta to support farming and population growth, 75 percent of the Skagit Valley's historic estuaries have been lost — a crushing blow to this productive river system.

A series of restoration projects by the Skagit System Cooperative, the natural resources consortium of the Swinomish, Upper Skagit and Sauk-Suiattle tribes, is working to bring these salty sanctuaries for salmon back to the basin. The effort has gained steam over the last several years with the restoration of Deepwater Slough, and has kicked into high gear this year with plans to recover lost habitat at other slough sites.

Hundreds of acres of new estuary habitat will be opened by the tribes' upcoming initiatives at Wiley Slough, Fornsbys Slough and other sites around the Skagit Valley.

"Estuaries are the dinner plates where young salmon feed," said Steve Hinton, director of restoration for SSC.

"The bigger and healthier fish get in the estuaries before they head to sea, the better their chances of survival," said Lorraine Loomis, fisheries manager with the Swinomish Tribe. "Plus, restoring estuaries increases the quantity and quality of the habitat they can return to. Habitat restoration projects like these are key to bringing our wild salmon back."

SSC studies have shown that rapidly disappearing salt marshes are forcing chinook smolts to crowd into shrinking amounts of available habitat. To SSC, this means that loss of estuarine habitat is among the most significant issues limiting chinook production in the Skagit basin. If adequate estuarine habitat is recovered, the agencies estimate adult chinook production could increase as much as fivefold under good ma-

rine survival conditions — from about 20,000 fish now to a robust 100,000.

Multiple government agencies are in concordance with the tribes on this. The state Department of Fish and Wildlife, the National Marine Fisheries Service and the tribes all agree that estuarine habitat is limiting chinook salmon populations in the Skagit River basin. It's a daunting task, though: fewer than 5,400 acres of functioning estuaries remain in the Skagit Valley today. One major reason is that waterways were straightened and diked for agricultural purposes over the last half-century or so.

"While some in the farming community have claimed that Skagit County has been replete with dikes for a century, this simply isn't the case," said Larry Wasserman, environmental director of SSC. Up until 1956, new dikes were still being constructed in the Skagit River delta, and important rearing areas for salmon were still being eliminated. Now, virtually the entire Skagit bayfront has been diked.

The problems with diking starts with habitat which is directly lost behind the barriers — but the problems don't end there. Access to habitat in front of the dikes is also degraded, because the river's flows no longer function as nature intended, distributing sediment and creating essential side channels.

The Model: Deepwater Slough

Three years ago, a decade-long effort by the tribes led to the removal of more than two miles of structures blocking historic wild chinook habitat.

The Deepwater Slough project, which saw SSC team with the Washington Department of Fish and Wildlife and the U.S. Army Corps of Engineers, was one of the largest dike removal programs in North America. SSC took charge of monitoring the project's progress, which three years later has proven to be a great success.

In areas of Deepwater Slough where the dikes have been removed, the past two years have seen colonization of native vegetation, improving habitat for fish and birds. As SSC staff had expected and hoped, fish have also been thriving in the new habitat.

"It's exciting for us to see our predictions come true," said Hinton. "We're seeing habitat created, and we're seeing strong numbers of fish use that habitat."

Continued, Next Page

'Estuaries are the dinner plates where young sa

The Future: Wiley Slough, Fornsby Slough

Two recently approved upcoming projects on sloughs in the region will continue the tribal push for estuarine habitat restoration.

A state Salmon Recovery Funding Board grant will fund the design stage for restoration work on Wiley Slough, a 1,000 acre site on public land.

At 185 acres, the habitat opened up by restoring Wiley Slough will approach the 220 acres opened up in the Deepwater effort. The design phase will commence in the next year, with a view to construction by 2006. Besides breaking down dikes that block access to habitat, plans to ensure boat access and the protection of the WDFW field office will be developed. Waterfowl viewing and hunting access will also be maintained. Habitat restoration at the Wiley Slough site will have the additional benefit of providing feeding habitat for wintering waterfowl and migratory shorebirds. This shows that ecosystem restoration benefits not only salmon, but many other fish and wildlife species, as well as people who hunt, fish, hike, or kayak in the scenic Skagit marshes, Wasserman said.

Much of the land slated for estuarine recovery is public. The Deepwater and Wiley slough sites are two prominent examples, as they both rest on WDFW land.

The Swinomish Tribe, though, just approved a similar project for Fornsby Slough, a site on the tribe's La Conner reservation.

"We're holding ourselves to the same standard we hold others," said Loomis. "Salmon recovery is more important to the tribes than anyone else, and we're proud to take the lead toward that goal."

– J. Shaw

On The Snohomish River Estuary



Tony Moses (left) and Robert Skoog, Tulalip fisheries technicians, examine their catch from a beach seine in the Snohomish basin. Photo: J. Shaw

The thousands of I-5 commuters passing over the Snohomish River and its familiar bevy of sloughs every day may not know it, but beneath the muddy flows of this network of channels swim a series of mysteries.

A cooperative study involving the Tulalip Tribes, the National Marine Fisheries Service and NMFS' Northwest Fisheries Science Center is peeling back the curtain on the secrets of the Snohomish.

"We're trying to understand how juvenile salmon use the estuarine habitats in the Snohomish River system," said Mindy Rowse, a NMFS biologist. Once that knowledge is gathered, it can be applied to preserving salmon and other fish species.

The multi-part study includes a comprehensive safe-capture beach seining program designed to determine the relative abundance and distribution of fish around the area's sloughs. Ebey Slough and Steamboat Slough are the major channels being surveyed.

The research into salmon and other species examines often-overlooked marsh habitats, trying to answer questions that are many and varied. A short list: How big are the fish that use these waters? For how long are they here? At what time of the year do they migrate out to sea?

"Answering these questions with the best possible science is a really important step," said Kit Rawson, senior fishery management biologist with the Tulalip Tribes. "That information is a powerful tool that can make our environmental restoration and fisheries management programs as effective as possible."

As in most tidal regions, urbanization has resulted in dramatic changes to the habitat over the past few generations. The mainstem of the Snohomish River as well as Steamboat Slough are mostly diked, which makes information about them extremely important. Two hundred years ago, fish could travel freely into a series of freshwater tidal marshes, forested wetlands, and other diverse habitats.

That's all changed, so studying the modern vegetation and current bank conditions in these channels is one key that might unlock important puzzles about the life cycles of Snohomish basin fish. A wide variety of species navigates these sloughs: there are the study's targeted species of chinook, coho, chum and pink salmon, along with cutthroat trout and steelhead, but there are also an array of other species, such as starry flounder and sturgeon.

Tribal participation is key to the success of the cooperative project.

"Because of our work with the tribes, it's a very efficient, compact study," said Kurt Fresh, research scientist with the NMFS Northwest Fisheries Science Center.

Since tribes are strategically located within watersheds, tribal natural resource workers are able to respond quickly and effectively to the changing needs of salmon recovery research. This is a real advantage when gathering valuable data.

"This wouldn't be possible without the tribes, in my mind," said Rowse.

– J. Shaw

Imon feed'

– Steve Hinton,
SSC Director Of Restoration

Quinalts Eye Lake Fertilization To Boost Sockeye Production

The Quinault Indian Nation (QIN) has completed three years of monitoring to see if Lake Quinault is a candidate for fertilization, a process that leads to improved food availability for sockeye salmon.

Sockeye (or blueback) salmon are culturally and economically vital to the nation. The Quinault River watershed, which includes Lake Quinault, is renowned for the blueback it produces.

“The lake is a crucial link in the life cycle of our sockeye,” said Bill Armstrong, fisheries biologist for the QIN. The adult fish spawn in the lake tributaries and their young rear in the lake for one or two years before going to the ocean. Biologists and technicians have sampled the lake for the past three years to establish seasonal levels of lake productivity and whether nutrient levels could be enhanced to improve biological productivity. “The results confirm that Lake Quinault is a good candidate for fertilization,” Armstrong said.

“What we’ve discovered is that the lake is nutrient limited,” said Armstrong. Phosphorus and nitrogen levels are very low, which in turn limits production of phytoplankton (microscopic water plants). Low phytoplankton concentrations keep populations of microscopic animals (zooplankton) at low levels that limit the amount of food available for young sockeye salmon to eat.

Lake Quinault has a temporary burst of plankton growth during the spring, but the lake is unable to maintain the production because of the low nutrient levels. “Lake Quinault is among the least productive coastal sockeye lakes,” said Armstrong.

When fertilizing a lake, nitrogen and phosphorous are added. “By adding nitrogen and phosphorus, you are providing the opportunity for an increase in the production of phytoplankton which in turn would provide more food for zooplankton,” said Armstrong. “One goal would be to increase phytoplankton and zooplankton populations to the point where they can carry over through fall and winter, continuing to build through the next growing season.”

The tribe has undertaken several projects to increase the numbers of sockeye returning to the Lake Quinault system, including sockeye supplementation projects.

The QIN will continue monitoring this year and may begin fertilizing the lake next year. – D. Preston



Bill Armstrong, biologist for the Quinault Indian Nation (QIN), right, inspects a water sample from Lake Quinault while fisheries technician Karl Braden pulls up a zooplankton net. Photo: D. Preston

Court Dismisses Skokomish Tribe’s \$6 Billion Claim

The 9th U.S. Circuit Court of Appeals has rejected the Skokomish Tribe’s \$6 billion claim that two dams on the Skokomish River violated the tribe’s fishing rights. The claim against the City of Tacoma was thrown out June 3 after a three-judge panel voted 2-1 to uphold a 2001 decision.

In that decision, U.S. District Court Judge Franklin Burgess ruled that Tacoma properly licensed the dams and the statute of limitations had expired on other claims made by the Skokomish Tribe.

The tribe has fought the Cushman Hydroelectric Project for more than 70 years.

The tribe filed the \$6 billion lawsuit in 1999, claiming Tacoma did not obtain a proper license to build the dams. The lawsuit also claimed that the project violated the tribe’s treaty-reserved fishing rights by diverting the river and destroying fish runs, which are key to the tribe’s economy and culture.

The two dams, built near Hoodspout, created two lakes: the 150-acre Kokanee Lake and the larger Lake Cushman, which has 23 miles of shoreline with summer homes and a resort. The dams also have raised the area’s water table and increased the amount and severity of flooding on the Skokomish reservation.

Mason Morisset, the tribe’s lawyer, said the 1924 license for the project authorized the city to flood only 8.8 acres of federal land near the reservation.

Because the City of Tacoma believed it was following the proper procedure to construct the dams, the city should not be held liable, according to the ruling by judges J. Clifford Wallace and Stephen Trott. Dissenting judge A. Wallace Tashima stated the tribe’s interest was never considered; therefore, the tribe has a right to sue.

Morisset said the tribe might appeal the ruling. – D. Friedel

Protecting Sauk River Tribe's Goal

To protect a pristine Washington river and the wild salmon within, the Sauk-Suiattle Tribe is pushing for a policy that is the first of its kind in the state.

The tribe has petitioned the state Department of Ecology to list the headwaters of the Sauk River as "Outstanding Natural Resource Waters." Such a designation would afford the ecosystem the highest order of protection, preserving the recreational and ecological value of the area for years to come. A decision on the petition is expected this summer.

"The tribe's culture is tied directly to this river system," said Jason L. Joseph, chair of the Sauk-Suiattle Indian Tribe. "Protecting this ecosystem and the fish that depend on it is of the utmost importance to us."

The Sauk forms the largest tributary system of the Skagit River. The Skagit, in turn, is the largest producer of Puget Sound fish runs – yielding 47 percent of the salmon returning to the sound, it is second only to the Columbia among northwest rivers.

While other states from California to Florida have used the designation with solid results, Washington has yet to try it.

Under the federal Clean Water Act, each state must adopt a policy to prevent further degradation of its water quality. States can designate waters as Outstanding National Resource Waters if they are "high quality waters . . . and waters of exceptional recreational or ecological significance."

Once implemented, the listing would prohibit the state from allowing water quality in the Sauk to diminish except in a temporary and short-term fashion. While some worry this might prohibit development, the tribe's take is quite the opposite; failure to protect the resource will diminish the scenic



Sauk-Suiattle tribal elder Lawrence Joseph, left, and tribal chair Jason Joseph are working to protect the Sauk River, which is central to the culture of the tribe – and the ecology and economy of the region.

Photo: J. Shaw

and recreational qualities of the area, which will cause visitor numbers to dwindle.

"The economic viability of Darrington and the surrounding communities depends on the river," said Doug McMurtrie, tribal environmental director. "People come here because of the great beauty, because they can catch and release native fish, because they can swim in and raft on pure water. We have to preserve that."

"Protecting the river now is much more cost-effective and environmentally sound than waiting," said McMurtrie.

"This is the right thing to do environmentally, economically, culturally and morally," said Joseph. "All we need is the political will to make it happen." – *J. Shaw*



Hitching A Ride

James Miller, Muckleshoot hatchery technician, pours juvenile chinook into a tanker truck that will take them up to one of several acclimation ponds in the upper White River. Ten to 12 weeks after being put into the ponds, the chinook will be released to migrate downstream. The Muckleshoot and Puyallup Tribes have been working successfully to boost spring chinook populations in the White River for the past several years. One site on the river with an acclimation pond has gone from zero redds – or salmon nests – a few years ago to 80 redds last year. *Photo: E.O'Connell*

Tribes Enhance Elk Herd Habitat

The work of wildlife recovery is often hard and not always glamorous. Once the tribal and state co-managers agree on the best available science, sometimes the path toward saving animal species is walked with a rake and a shovel in hand.

That's why tribal leaders and other volunteers are out in the Baker Lake area on a blistering hot June Saturday, painstakingly ripping out noxious weeds and lifting heavy salt blocks into place. Tribal and state biologists have established which plants are healthy for elk and which plants are poisonous; the next step is the laborious task of removing certain dangerous non-native species and replacing them with a mix of healthy native plants.

"This place is loaded with tracks, so we know it will support elk," said Todd Wilbur, chairman of the Northwest Indian Fisheries Commission's Inter-Tribal Wildlife Committee, after removing a burgeoning stand of Scotch broom. "We're trying to make these sites as elk-friendly as possible."

Later this fall, treaty Indian tribes in western Washington and the Washington Department of Fish and Wildlife will transfer animals from the healthy Mount St. Helens herds into the north sound – an event three years in the making. In preparation for this crucial project, the Point Elliott treaty tribes are teaming up with the Rocky Mountain Elk Foundation and forest products corporation Crown Pacific to improve the region's habitat.

At two sites, one along Bear Creek and another along the South Fork of the Nooksack River, tribal and non-tribal crews have spent months removing undesirable plants like foxglove and cultivating a variety of staple foods for hungry elk. These efforts will assist animals already living in the area as well as the anticipated new arrivals.

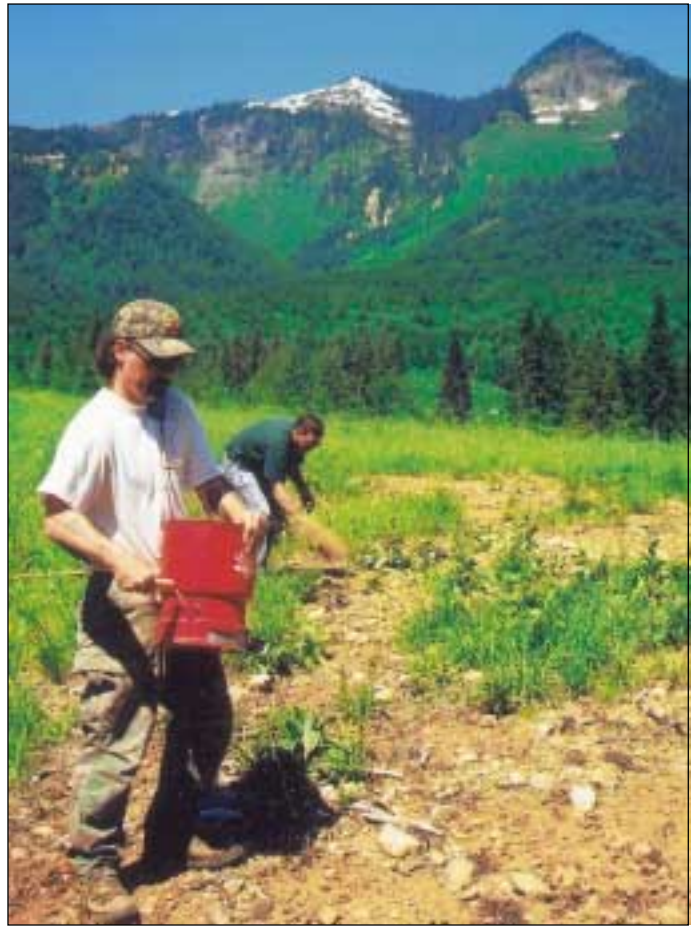
"Years of work are about to pay off," said Wilbur. "This would never have happened without the cooperation of all the Point Elliott treaty tribes." Those tribes include Lummi, Nooksack, Swinomish, Upper Skagit, Sauk-Suiattle, Stillaguamish, Tulalip, Muckleshoot and Suquamish.

The goals here are simple: make sure elk that roam these fields, meadows and tree stands are well-fed and healthy. In turn, that improves safety for the herd in other ways.

"Having food available here in the meadows prevents elk from wandering toward the highway," said Shawn Yanity, vice chairman of the Stillaguamish Tribe. "By ripping up invasive plants and replacing them with nutritional grasses that elk love, we hope to improve their chances of survival."

Additionally, crews took on the arduous task of hauling 50-pound medicinal salt blocks into the surrounding woods. The hearty blocks contain medicine to guard against parasites and are full of vitamins and minerals for wandering bull and cow elk.

The Nooksack elk herd, which was traditionally hunted by the region's tribes, needs all the help it can get. Two decades ago, nearly 2,000 animals roamed these tracts of land as part



Shawn Yanity, Stillaguamish fisheries director and tribal vice-chairman, scatters a mix of native grass seed along a meadow near Bear Creek. *Photo: J. Shaw*

of the herd. Due to a variety of factors – habitat destruction included – the population has dwindled below 400 elk. The few surviving animals wander their historic home in scattered bands. Both tribal and non-tribal hunting has been closed for over five years to prevent the herd from dipping further toward extinction.

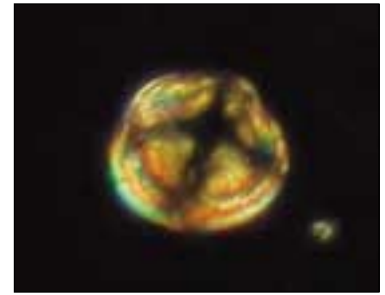
"The tribes have proven we're willing to make great sacrifices for the future of the resource," said Wilbur. "Giving up hunting is a huge blow to us, but we've been willing to make that sacrifice – and also commit millions of dollars and thousands of hours toward restoration work. In the long term, it's unacceptable to us to let these animals die off. We'll work as hard as we have to in order to save them."

The Swinomish Tribe supplied the funding for the restoration work.

"Having healthy elk herds is absolutely essential to the tribes; working together is the best way to achieve that goal," said Wilbur. "We're thrilled to partner up with other groups and organizations who also care about preserving our elk."

– J. Shaw

Puyallups Track Baby Geoducks To Improve Resource Management



The image of a typical stuck-in-the-mud adult geoduck clam belies the bivalve's more free-flowing young life. "For the first few weeks, clams and other shellfish float in the current," said David Winfrey, shellfish biologist with the Puyallup Tribe of Indians. Winfrey is tracking the earliest stage in the geoduck life cycle, when the usually settled bivalve is as free floating as any fish. "Their only limitation is how far the tide and ocean currents will take them."

For the past six months, Winfrey has been collecting shellfish larvae at various locations around the Puyallup Tribe's treaty reserved fishing area. "To really understand the dynamics of the geoduck populations, we need to look at their entire lifecycle," said Winfrey.

The project is a pilot study of a more thorough examination planned for next spring.

In addition to being the foundation for future generations of geoducks and other clams, larvae also support many other populations higher up on the food chain, including juvenile fish and other marine crustaceans which are an important food source for juvenile salmon and baitfish.

Winfrey is out on the water once or twice a week collecting samples. Using a small net with extremely fine mesh, he makes several tows in every location. "Mainly, we're looking for geoduck larvae, because they are an important tribal fishery," he said.

The geoduck clam is the largest bivalve in Puget Sound and the largest burrowing clam in the world. About 109 million adult geoducks live in Puget Sound, the greatest concentration of any marine animal. Puget Sound bays and estuaries harbor the highest density of geoducks in the continuous United States, with the



David Winfrey, shellfish biologist with the Puyallup Tribe, examines a plankton sample taken in Quartermaster Harbor near Tacoma. *Photo: E. O'Connell*
Above, a clam larvae as seen under a microscope. *Photo: D. Winfrey*

most abundant area being southern Puget Sound.

Clams will usually start spawning in early spring, when plankton, their main food source, is more plentiful and "the clams are hit by a slug of food," said Winfrey. After the clams release their sperm and eggs, a small percentage find each other in the water and become larvae. After feeding in the water column for up to several months, the larval clams gain enough weight to settle onto the sea floor and continue growing.

"We want to find out how successful clams are at reproducing each year," said Winfrey. "Do conditions have to be just right, and how often do these conditions

occur?" Just because there is a lot of larvae in the water doesn't mean a lot of clams will start growing in the mud, he pointed out. The larvae also need to have a successful settling and recruitment into the population, and Winfrey isn't sure what causes that to happen.

Getting that basic information on the early life cycle of clams is important to their management, said Winfrey. "If we know more about how and when clams breed, and can track other characteristics of their early life cycle, then the tribe and state can be more responsible co-managers." – *E. O'Connell*

Smolt Traps Aid Collection Of Important S

Smolt traps allow the capture and safe release of young salmon as they migrate to sea. They are one of many tools used by the treaty Indian tribes in western Washington as co-managers of the salmon resource. The traps aid in the collection of a wide range of data critical to protecting and enhancing salmon stocks in the region. Following are several examples of how tribes are applying smolt traps in salmon management.

Squaxin Island Tribe Finds Salmon Above Old Dam

Since the Goldsborough Creek Dam was torn down two years ago, hundreds of salmon have begun spawning above the site of the old dam. Last year, the Squaxin Island Tribe counted over 15,000 young chum salmon migrating down from the newly opened habitat. “A lot of great salmon habitat was blocked when Goldsborough Dam was built. We’re excited to see how many salmon have been getting up there in the two years the creek has been open,” said Joseph Peters, fisheries biologist with the Squaxin Island Tribe. “The success of removal can’t be judged without first seeing how many salmon use the new habitat.”

This year, the tribe is continuing its efforts to assess the benefits of removing the Goldsborough Dam. Removal of the dam was a cooperative effort involving the Squaxin Island Tribe, Simpson Timber Company (the dam's owner) and local, state and federal agencies. Twenty-five miles of habitat, including some notable spring-fed wetlands important to coho rearing, were opened after the dam came out.

In addition to surveying returns of spawning adults this fall, the tribe has also been operating a couple of smolt traps to monitor production of the creek.

Smolt comes from the word “smoltification” which is the term used to describe the physiological transformation that young salmon undergo while in freshwater, just before migrating down-



From left, Joe Puhn, Mike Henderson, Derek Bartczak, Rusty Cooper, Joseph Peters and Daren Brownfield of the Squaxin Island Tribe’s natural resources department tow a smolt trap up Goldsborough Creek. *Photo: E. O’Connell*

stream and entering saltwater.

“Because juvenile coho ‘over-winter’ instead of leaving freshwater the same year they hatch, we won’t start seeing the offspring of the first post-Goldsborough dam coho until this year,” said Peters. The tribe is carrying out the trapping under contract with the U.S. Army Corps of Engineers, who conducted the dam removal.

At least twice a day, tribal staff check the traps, noting species types and lengths. “We are getting a cross section of the salmon that are migrating out to sea,” said Peters.

Goldsborough Creek is in a network of five other creeks the Squaxin Island Tribe has been monitoring for the last several years.

In addition to studying the effects of dam removal, the trapping also aids fisheries management. “Every piece of information we can pick up, from the number of adult spawners to smolt production, goes to planning future fishing seasons,” said Peters. “Providing sustainable fisheries on chum and coho is a major goal for the Squaxin Island Tribe, and collecting this data is the best way we can assure that.”

The removal of the Goldsborough Dam confirms the importance of protecting and restoring salmon habitat. “Return-

ing adults can have access to all the habitat in the world, but it won’t matter if the habitat they’re returning to is bad,” said Jim Peters, the tribe’s natural resources director. “All salmon need is good habitat and the ability to access that habitat. Decreasing harvest over the past 20 years has only gone so far in terms of salmon restoration; we have to work just as hard to repair damaged habitat.”

– E. O’Connell

Tribes Study Salmon Migration On Hamma Hamma

Using a small net, Greg Sullivan scoops the remaining salmon from a smolt trap’s holding tank and counts his catch before releasing the juvenile fish back into the river. “That’s the last of them for today,” says the Port Gamble S’Klallam Tribe’s natural resources technician, who checks the trap on the Hamma Hamma River twice a week. “That makes 1,253 juvenile salmon. That’s by far the most I’ve seen here at one time.”

And that’s a good sign. The more fish that show up in the smolt trap’s tank, the more accurate of a count the tribe can get on how many juvenile salmon – or smolts – are migrating from the freshwater of the Hamma Hamma River into

Salmon Data

the saltwater of Hood Canal. The smolt trap is part of a project conducted by the Port Gamble and Skokomish tribes, a local landowner, Long Live the Kings, the Hood Canal Salmon Enhancement Group and the Washington Department of Fish and Wildlife.

“The level of smolt production from the river is important because it reflects the quantity and quality of freshwater salmon habitat available in the watershed,” said Cindy Gray, Port Gamble S’Klallam fisheries biologist. “That information will help us forecast future adult salmon returns and determine what is best for this river in terms of harvest management, stock enhancement and habitat restoration. It’s not enough to just know how many salmon return to the river, we need to know how many are leaving, especially Hood Canal summer chum.”

Along with Puget Sound chinook salmon and Lake Ozette sockeye, Hood Canal summer chum are listed as “threatened” under the federal Endangered Species Act. The information collected about the summer chum salmon population on the Hamma Hamma River will go a long way toward helping the species rebound in the Puget Sound region. Declining chinook, pink and coho salmon, along with steelhead populations, also will be studied.

The Robbins family, which owns the property along the portion of the river where salmon spawn, has allowed those involved in the project to have access to their land. “Without their help, we would not be able to conduct this important research,” Gray said.

The Hamma Hamma River is located in northern Mason and southern Jefferson counties. Its watershed is one of the largest contributing to Hood Canal, with a mainstem of about 30 miles and about 140 miles of tributary habitat.

“Cooperative projects involving tribes, the state, local landowners and nonprofit organizations are needed if we are going to help struggling salmon populations in the Pacific Northwest,” said

Dave Herrera, fisheries manager for the Skokomish Tribe. “This project is a perfect example of several groups working together for a common cause – to save the region’s salmon stocks.”

– D. Friedel

Quileute Tribe Measures Success On Dickey

While some people count sheep at night, Donald Penn probably counts young fish as they flow through his subconscious. It’s the result of the Quileute fisheries technician spending days – and some nights – counting and identifying salmon and trout on small streams that flow into the Dickey River on the Olympic Peninsula.

The project is part of the Quileute Tribe’s effort to assess whether the Dickey River drainage has improved in salmon production since a number of changes to help fish were made. Since early March, Penn and other Quileute fisheries technicians have been checking seven smolt traps each day.

The Dickey drainage produces more coho smolts per mile of habitat than any other drainage in the Quillayute River system. The land ownership is a mix of state and private timberland that, prior to the implementation of forest practices rules, suffered from the effects of intensive timber harvest.

“We should see more fish coming out of there than 10 years ago,” said Frank Geyer, Timber/Fish/Wildlife biologist for the Quileute Natural Resources Department. “The Dickey was considered 100 percent seeded back then, meaning fish were utilizing all the habitat they could get to. But since then, numerous habitat restoration projects have taken place including the removal of fish-blocking culverts, so the numbers of fish produced should increase,” Geyer said.

The emphasis on this project is tracking juvenile coho, although all fish are being identified and counted. It is part of a multi-year plan to track fish on the



Donald Penn, left, and Joe Garrick, fisheries technicians for the Quileute Tribe, gather data from smolts collected on a Dickey River tributary. Photo: D. Preston

Dickey and later use the monitoring method to apply to the Sol Duc and Bogachiel drainages.

In addition to monitoring smolt production of the tributaries, the tribe has also placed a trap in the main channel of the Dickey River where fish are counted again to further refine assessments of smolt production of the tributaries.

The study will continue for three seasons to estimate the trend in numbers of juvenile coho heading to sea. When combined with the surveys of returning fish and the numbers of redds (salmon nests) in the fall, the data will give the tribe a better understanding of what the sustainable harvest levels should be for the Dickey system each year.

The study is funded by a federal Pacific Coastal Salmon Recovery grant of \$417,500. “We are continuing to work on cooperative projects with forest landowners like Rayonier to improve conditions for fish,” said Mel Moon, natural resources director for the Quileute Tribe. “Smolt traps are an important salmon monitoring element and a vital management tool for our fisheries.” – D. Preston

Tribes Released 41 Million Fish In 2002

Treaty Indian tribal hatcheries in western Washington released 41 million young healthy salmon in 2002, according to recently compiled data. Releases included 15 million chum, 15 million chinook and 9 million coho, in addition to about 1 million each of sockeye and steelhead.

Last year's total releases marked an 11 million increase over 2001, due primarily to improved ocean conditions which led to larger returns. This enabled most tribal programs to reach their egg-take goals. Some of the fish were produced in cooperation with the Washington Department of Fish and Wildlife, U.S. Fish and Wildlife Service, regional fisheries enhancement groups, and sport and community groups.

Returning adults will be harvested by both Indian and non-Indian fishermen. Restrictions on fishing times, locations and gear enable the tribal and state co-managers to target healthy stocks while ensuring that incidental harvest of weaker wild stocks is minimal.

With the listing of three western Washington wild salmon stocks as "threatened" under the Endangered Species Act, tribal and state managers have been conducting a comprehensive review of how hatcheries can aid wild stock rebuilding efforts. The four-year-old Hatchery Reform Project is provid-



Assistant Hatchery Manager Marlin Dennis feeds young salmon at the Lummi Nation's Skookum Creek Hatchery. *File Photo*

ing a science-driven method to address how hatcheries can help recover and conserve naturally spawning salmon populations and support sustainable fisheries.

The Hatchery Scientific Review Group (HSRG), an independent science panel component of the Hatchery Reform Project, is nearing completion of a review of all hatchery operations in western Washington. The reviews include consideration of each hatchery program's overall effectiveness and goals, as well as their effects on naturally spawning salmon and trout stocks in western Washington.

The HSRG has completed reviews of hatchery operations in six of 10 regions in western Washington. The remaining four areas will be completed this year. Some of the regional recommendations proposed so far include:

- Measure hatchery success in terms of contribution to harvest, conservation and other goals. In the past, hatchery programs too often were evaluated primarily on numbers of fish released. More appropriate measures of success, according to the HSRG, include fish quality, contribution to harvest opportunity and numbers of adults returning to reproduce and sustain the stock.
- Develop evaluation and monitoring programs to ensure accountability for success.

The HSRG also has made specific recommendations for hatchery operations within the areas reviewed so far. They include suggestions for improvements to spawning, rearing and release strategies, as well as reductions in production levels at some facilities and elimination of some programs.

"Hatcheries have an important role to play in the recovery of wild salmon," said Billy Frank Jr., NWIFC chairman. "We are developing a vision for how hatcheries can be managed in the future to protect wild salmon and provide for sustainable fisheries. To carry out that vision, we are developing an integrated approach to hatchery reform based on solid science. With this vision and plan for action, I am confident that we can achieve our goals." – *T. Meyer*

Northwest Indian Fisheries Commission
6730 Martin Way East
Olympia, WA 98506
(360) 438-1180

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