Puget Sound Water Quality Action Team

Volume 16, No. 3
Summer 2001

Sound WAVES

Action Team and Partners Look at New Approaches to Habitat Restoration

Puget Sound comprises a collection of essential habitats. Sand flats, eelgrass, kelp beds, or rocky reefs are key to the survival of our marine life. Throughout their lifecycle, marine species depend on the variety of habitats Puget Sound offers to reproduce, grow, feed and protect themselves. This is why habitat loss and degradation has played a significant role in the decline of many marine species.

Puget Sound habitats remain under extreme stress from human activity.

Pollution changes habitats by favoring tolerant species over more sensitive ones. Over-water structures such as piers and docks can shade marine vegetation out of existence. Bulkheads can interrupt natural drainage and sediment patterns on the beach, degrading vital nearshore habitat.

The current diminished state of marine habitats can be attributed to a less enlightened past.

Fortunately, many dedicated people and organizations are creating and using new tools to help replace lost habitats and their functions for marine species, or at least, protecting the good stuff that's left.

Historically, habitat management focused on replacing the structural components of lost or degraded habitats, ignoring the natural processes that created the habitat structure. A saltwater wetland, for example, is a product of natural erosion, sedimentation, flooding and plant colonization that occurs over long periods of time and across large areas of the landscape. Simply constructing something that looks like a saltwater wetland doesn't work. The Marine and Freshwater Habitat Program in the *2000 Puget Sound Water Quality Management Plan* changes the philosophy on how we will manage habitats. The goal is to preserve, restore and enhance the ecological processes that create and maintain marine and freshwater habitats and to achieve a net gain in area and ecological function of those habitats within the Puget Sound basin. Many Action Team agencies and partners are now moving in this direction. For example:

- The Northwest Straits Commission, a congressionally authorized body, oversees and funds county-level marine resource committees (MRCs) in northern Puget Sound and the Strait of Juan de Fuca. The MRCs compile existing information, conduct new research, and design restoration projects to restore ecosystem processes and rebuild fish stocks.
- The Washington State Department of Ecology updated its Shoreline Master Program guidelines directing local governments to consider the natural ecosystem processes along their shorelines through appropriate shoreline designations and protective policies.
- A number of agencies and organizations in Puget Sound

See ***Restoration****, page 7*

Now is the time to apply for a slice of PIE

Do you have an innovative idea for a project that encourages people to take actions in their daily lives to protect and restore Puget Sound?

If so, you might want to consider submitting a proposal for funding through the Action Team's Public Involvement and Education (PIE) Fund.

The PIE Fund supports public involvement and education projects aimed at protecting and improving Puget Sound's water quality and marine resources. Any Washington State resident, business, organization, tribal or local government, school or educator may apply.

You can download the Request For Proposals from the Action Team's website by following the links from our home page at www.wa.gov/puget_sound. To request a printed copy, call (360) 407-7300 or (800) 54-SOUND.

Maximum funding per project is $45,000. If your project costs are $3,000 or less, consider applying for a PIE Small Award through our website.

Application deadline is 5 p.m., Monday, August 27, 2001.

Puget Sound Water Quality Action Team

(800) 54-SOUND • (360) 407-7300
http://www.wa.gov/puget_sound
e-mail: tdroscher@psat.wa.gov

Inside This Issue

The Puget Sound Water Quality Action Team and its advisory arm, the Puget Sound Council, were created by the Washington State Legislature to lead efforts to protect Puget Sound.

Chair: Nancy McKay

Action Team Members

Cities
Chuck Booth, Mayor, City of Auburn
Counties
Louise Miller, Vice Chair, Metropolitan King County Council
Department of Agriculture
Jim Jesernig, Director
Office of Community Development
Busse Nutley, Director
Department of Ecology
Tom Fitzsimmons, Director
Department of Fish & Wildlife
Jeffrey Koenings, Director
Department of Health
Mary Selecky, Secretary
Department of Natural Resources
Francea McNair, Aquatics Steward
Department of Transportation
Doug MacDonald, Secretary
Interagency Committee for Outdoor Recreation
Laura Eckert Johnson, Director
State Parks & Recreation Commission
Cleve Pinnix, Director
Wash. State Conservation Commission
Steve Meyer, Executive Director
Tulalip Tribes
Daryl Williams, Director, Department of the Environment
Environmental Protection Agency
Ron Kreizenbeck, Acting Deputy Regional Administrator
National Marine Fisheries Service
Donna Darm, Acting Regional Administrator
U.S. Fish & Wildlife Service
Ken Berg, Manager

Puget Sound Council Members

Agriculture
Jerry Van der Veen, dairy farmer
Business
Kirk Anderson, Fisher Communications, Inc.
Environmental Community
Tom Putnam, Puget Soundkeeper Alliance
Shellfish Industry
Bill Dewey, Taylor Shellfish Co., Inc.
Cities
Jackie Aitchison, Poulsbo City Council
Counties
Rhea Miller, San Juan County Board of Commissioners
Tribes
Fran Wilshusen, Northwest Indian Fisheries Commission
State Senate
Senator Tracey Eide (D-Federal Way)
Senator Pam Roach (R-Auburn)
State House of Representatives
Phil Rockefeller (D-Kitsap)
Representative Gary Chandler (R-Moses Lake)

Legislature enhances funding for work plan

Budget and Legislative Action

At press time, the Washington State Legislature had completed its second special session, passing operating and capital budget bills for the 2001-2003 biennium that continued funding for most of the Action Team's programs. New policy legislation gives the Action Team staff additional responsibilities. **Substitute Senate Bill 5637** seeks better coordination of watershed health and salmon recovery monitoring and places an Action Team representative on a new eight-member oversight committee. **Engrossed Second Substitute House Bill 1658** creates a new grant program to help homeowners fix on-site sewage systems that are contaminating shellfish growing areas in the 12 counties of Puget Sound and in Pacific and Grays Harbor Counties. Funds generated from commercial shellfish operations on state tidelands will be channeled through local health departments. The Action Team staff will manage this program.

2001-2003 Appropriations

Funding its *2001-2003 Puget Sound Water Quality Work Plan* was the Action Team's top priority for the 2001 legislative session. With a few exceptions, lawmakers held work plan appropriations at the amounts approved for the previous biennium, keeping most Action Team agencies' Puget Sound water quality efforts at, or near, current levels.

The following priority initiatives were NOT funded:

- Local government updates of shoreline master programs and critical areas ordinances.
- Additional water quality educators (field agents) at the University of Washington and Washington State University.
- Expansion of the Action Team's Public Involvement and Education (PIE) program.
- Diagnostic studies by the Puget Sound Ambient Monitoring Program (PSAMP).

The work plan-related budgets of the Department of Health and the Department of Fish and Wildlife were reduced. Health's reduction will delay adding information on biotoxins to an integrated data system that characterizes water quality in shellfish growing areas. The Fish and Wildlife budget reduction will end wetlands planning work on the department's lands, including those in the Puget Sound region, and will severely reduce technical assistance to Puget Sound local governments on wetland assessment and management issues.

The legislature provided enhancements to the Department of Ecology to implement Puget Sound work plan actions related to stormwater management, oil spills, and flow monitoring. A $200,000 enhancement will support technical assistance on stormwater to local governments. While the enhancement addresses an Action Team priority, it is less than that recommended by the Puget Sound Council and Action Team. Ecology's oil spill prevention efforts will be enhanced by more than $2 million, including support to continue rescue tug services at Neah Bay, one of the Action Team's highest priorities. The legislature also provided a $640,000 enhancement for flow monitoring in Puget Sound streams.

The legislature also provided other enhancements that were not provisoed for the Puget Sound work plan but will benefit Puget Sound. Ecology received an enhancement of $12 million for watershed planning. The Interagency Committee for Outdoor Recreation received $1.5 million to coordinate development of a new statewide strategy to monitor watershed health.

Action Team plans available on web, CD-ROM

The *2001-2003 Puget Sound Water Quality Work Plan* is a useful tool for learning about how our state and local governments are working to protect Puget Sound and its natural resources. Soon you'll be able to access the complete work plan as approved by legislature on the Action Team's website at (http://www.wa.gov/puget_sound/).

You'll have two options for viewing the work plan on the website: link to the entire plan on the Action Team's website; or visit the individual program pages listed on the left side of the screen and follow the link to "Current Activity." You'll go directly to the specific program's activity and information within the work plan.

Each program page on our website also includes a link to "Long Range Plan." This takes you to our *2000 Puget Sound Water Quality Management Plan,* which is Washington State's strategy for protecting and enhancing the water quality and biological resources of Puget Sound.

Both the work plan and the management plan will also be available on CD-ROM later this summer. To request a free copy of the CD-ROM, contact the Action Team at (360) 407-7300 or (800) 54-SOUND or e-mail: gwilliams@psat.wa.gov.

News From Around Puget Sound

Oyster farming returns to Drayton Harbor

The Puget Sound Restoration Fund initiated a three-year program to restore oyster farming to Drayton Harbor in Whatcom County. After a decade of declining water quality and shellfish downgrades that now prohibit shellfish harvesting in the entire harbor, project organizers have taken the bold step to enlist community volunteers and reestablish a functioning community oyster farm on two acres of tidelands. With start-up funding from Puget Sound shellfish growers, the Action Team's Public Involvement and Education Fund and other sources, local residents staked and seeded the oyster beds this spring. Growth of the oysters will now be monitored and reported in tandem with efforts to control pollution and restore water quality in the harbor. Harvest of the oysters is scheduled for 2004, setting in motion a strict timeline for upgrading the harbor's shellfish harvesting classification. Proceeds from the community oyster farm will be used to support ongoing cleanup activities. Contact: Betsy Peabody, Puget Sound Restoration Fund, (206) 780-6947 or bpeabody@connectexpress.com.

Renton bog undergoes restoration

King County is in the process of restoring a peat bog near Renton that provides hydrologic buffering for downstream habitat. Twenty-seven acres of the original 33-acre sphagnum bog were mined for peat. The remaining portion of the peat bog is undergoing rapid degradation due to the altered hydrology at the mined face of the bog. The water levels within the bog are dropping, even during the wet season, which will ultimately lead to accelerated decay of the peat and increased levels of nutrients in the water seeping from the bog. King County purchased the site in 1998 to preserve the existing bog and restore the mined area to wetland. Contact Tom Kantz, King County DNR, (206) 296-1941 or Tom.Kantz@metrokc.gov

Kitsap program results in request to remove Purdy Creek from 303(d) list

Congratulations to the Bremerton-Kitsap County Health District and the Kitsap Conservation District for a Memorandum of Agreement (MOA) signed in April 2001, to formalize interagency procedures for water quality cleanup. Under the Pollution Identification and Correction program funded by Kitsap County Surface and Storm Water Management fees, the health district conducts sanitary surveys that look at water quality problems beyond septic systems, and refers livestock waste problems to the Conservation District for education and outreach assistance. Although the health district can enforce against an uncooperative landowners using the health district's Solid Waste Regulations, landowner education efforts have limited the enforcement actions to rare occasions. Implementation of this program in Purdy Creek, which drains to Burley Lagoon, has contributed to the health district's recent petition to Ecology for the removal of Purdy Creek from the Clean Water Act 303(d) list of water quality impaired streams. For more information, contact Keith Grellner, (360) 337-5284 or grellk@health.co.kitsap.wa.us

Nearshore mapping starts in Island County

The Island County Marine Resources Committee (MRC) will soon map eelgrass, bulkheads and forage fish spawning areas along the shores of Whidbey and Camano Islands. The committee was recently awarded funding for the project from the Salmon Recovery Funding Board; the University of California, Davis, Marine Ecosystem Health Program; and the Northwest Straits Commission. The project includes Geographic Information System mapping and outreach components as well. Simultaneously, similar nearshore projects were funded in San Juan, Clallam and Jefferson counties. All are to be regionally coordinated by the Island County MRC. The data collected will be incorporated into county maps and used in land use and planning decisions. Contact Gary Wood, Island MRC Executive Director, at (360) 279-9612 or gwood@whidbey.net.

Land cover mapping for Thurston County

Linking science to land use decision-making, staff members at the Thurston Regional Planning Council (TRPC) are generating land cover maps for all of Thurston County based on satellite data. A grant from the Office of Community Development allowed TRPC to buy data from the Indian Remote Satellite and turn it into information on land cover. This information can help determine percent of impervious surface coverage in a basin, or the extent of countywide clearcuts at a point in time. In addition to a digital land cover map for the current year, TRPC also hopes to go back in five-year intervals to 1985 using Thematic Mapper data to look at changes in land cover over time. This information will be especially useful for hydrologic stormwater modeling, trends in growth and analysis of changes in wildlife habitat and transportation corridors. For more information, contact Veena Tabbutt, TRPC, (360) 786-7480 or tabbutv@co.thurston.wa.us.

Soundwatch promotes whale-watch protocol

Last year, more than 500,000 people went whale watching in the Salish Sea aboard approximately 80 commercial powerboats. The Friday Harbor Whale Museum estimates that nearly 21,000 more people whale watched from pleasure boats and kayaks. The Whale Museum's Soundwatch boat will be out this summer checking in on the whale watch boats or patrolling marine reserves. Soundwatch is not an enforcement program—it's all about education. If whale watchers are not following proper protocol, the Soundwatch coordinator will remind them. If fishers are fishing in bottomfish recovery areas, the Soundwatch coordinator will let them know they are in the wrong spot and encourage them to go elsewhere. "We seldom see repeat offenders," said Kari Koski, Soundwatch coordinator. Soundwatch patrols the boundaries of 83 federal wildlife refuges and wilderness areas set aside as by U.S. Fish and Wildlife Service. These wilderness areas provide seabirds, eagles and marine mammals with an undisturbed place to live and raise their young. All of the refuges are closed to public access, and boats of all types are required to stay at least 200 yards offshore.
For more information on Soundwatch, go to www.whale-museum.org or contact Kari Koski at (360) 378-4710, box 33.

Puget Sound Water Quality Action Team Local Liaisons:

Island and Snohomish counties:
Joan Drinkwin, (360) 848-0924

Thurston County:
Tim Ransom, (360) 407-7323

Mason, Whatcom, and Skagit counties:
Stuart Glasoe, (360) 407-7319

San Juan County:
Ginny Broadhurst, (360) 738-6122

Clallam, Kitsap and Jefferson counties:
Harriet Beale, (360) 379-4441

Pierce and King counties:
Kathy Taylor, (206) 263-6344

Orca whales: A species on the brink

A coalition of researchers and advocates has proposed the listing of orca whales as endangered under the Endangered Species Act. This step caps a frenzy of media coverage of the whales similar to that seen in the late 1960s. Back then coverage reflected public concern over the capture of local whales for display in aquariums. Now the future of the whales again is in doubt, this time because of the long-term impacts of our use—and abuse—of the whales' environment, the waters they swim in and the food they eat.

Top predators in every ocean in the world, orcas are either fish-eaters or marine mammal-eaters, locally called residents and transients, respectively. In the Pacific Northwest, resident whales eat mostly salmon. They consist of two populations that remain inshore (the northern and southern resident populations) and a third that lives offshore. Transients range widely along the west coast.

Orca populations are made up of pods, or family groups. The best known to Washington State residents and visitors are J, K and L pods—the southern residents. This small population was decimated by the captures of the 1960s. Some 34 individuals, most of them young animals, were taken, and a dozen more died in the attempt. The impact was both severe and long lasting. Orcas reproduce very slowly and give birth only about every three years. For a population that was probably small to start with, these factors meant a slow recovery in population.

Through the 1980s and 1990s, the southern resident population slowly grew to 98 individuals, despite the loss of reproductive-age individuals to capture (see graph on page 5). Then the decline in numbers began again and now has reached 15 percent since 1996. The very survival of J, K and L pods is threatened.

The extinction of orcas would be devastating. But even more to the point, orca whales are an indicator species. Like salmon and shellfish, they represent an entire ecosystem. Threats to them reflect on our own future.

Photo by Russ Hoelzel. Courtesy of Friday Harbor Whale Museum

Causes of the decline

Whale researchers have identified several factors that, combined with small population size, threaten the survival of the southern residents. These include toxic contaminants, reduction in food supply, and the impacts of whale watching.

We know that toxic contaminants move through the marine food chain and accumulate in top predators. Still, it was a shock to discover in 1996 that levels of PCBs in the blubber of the southern residents were three times higher than those known to cause immune system collapse in harbor seals. The effects of PCBs on immune, reproductive and endocrine systems are likely causes of deaths among the southern residents, particularly young whales who may receive huge toxic loads of contaminants from their mothers before birth and while nursing.

The severity of the decline of the southern resident's preferred food—chinook salmon—was acknowledged in 1999 when it was listed as threatened under the ESA. Researchers believe that fewer and smaller salmon mean the whales have to hunt longer and harder—the reason, perhaps, southern residents traveled to Monterey Bay during the winter of 2000, some 1,000 miles from home. Recent evidence from dead whales also suggests that orcas are absorbing fat reserves normally stored in their blubber, releasing toxic chemicals that may further damage other sensitive tissues.

In 20 years, local whale watching has grown from a handful of boats to a multi-million dollar industry. At times as many as 40 commercial and private vessels surround the southern resident pods. Huge, noisy ships ply the straits, carrying materials to and from major ports. Common sense says that all this has to be stressful for a species that relies on its hearing for communication and prey location. Some researchers think the constant proximity of many boats affects the whales' behavior, particularly their ability to rest and pursue prey.

Can we fix it?

The Center for Biological Diversity expects the southern resident population to be extinct within 200 years if the current population decline continues. To turn this trend around will not be simple or easy. But it can be done, says Dr. Richard Osborne, Research Director of The Whale Museum. "It's not impossible to turn around the environmental degradation of the Salish Sea, so that these orca will survive. But it is going to take a lot of collective will to do so."

To save the whales, like the salmon, will depend on our willingness to change some of the most basic ways we use the land and water, and how we live and conduct our business. Everything we do, from whale watching to how we use and dispose of chemicals, must be re-examined and improved. Some of this work has already begun.

The whale-watch industry recently stepped up efforts to police itself. Canadian agencies started a public education program, similar to the

See ***Orcas,*** *next page*

More orcas reported missing

On June 16, the Center for Whale Research announced the disappearance of an additional six whales from L Pod, the largest of the three southern resident pods. The missing include three adult males, an adult female, and two calves. This loss, and the birth of one new calf and the disappearance of another in K pod, brings the total population to 78 whales.

"We're in shock," said Kelly Balcomb-Bartok of the center. "But the upside is that this kind of news brings people together. That's what has to happen if we are going to pull off all that needs to be done."

Orca whale resources

Local Puget Sound Research Groups

The Whale Museum	www.whale-museum.org
Center for Whale Research	www.whaleresearch.com

Conservation Organizations with special interest in orca whales

American Cetacean Society	www.acsonline.org
Center for Biological Diversity	www.biologicaldiversity.org
Friends of the San Juans	www.sanjuans.org
People for Puget Sound	www.pugetsound.org

News stories:

Seattle Post Intelligencer "Add orcas to endangered list, groups ask"
http://seattlep-i.nwsource.com/local/20999_orcas01.shtml

Bremerton Sun "Endangered? Orcas"
www.thesunlink.com/news/2001/march/0325orcas.html

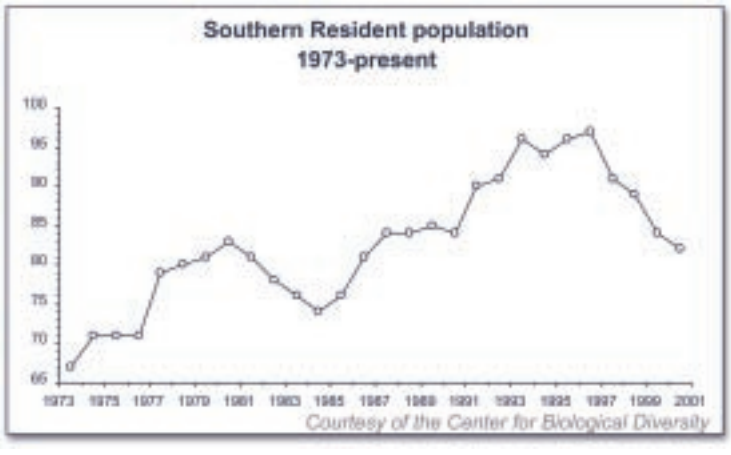
Seattle Times "A poison on the move"
seattletimes.nwsource.com/news/health-science/html98/orca_19991102.html

Washington Post "Toxin Threatens a Wonder of the Northwest" (Nov. 8, 1999)

Orcas, continued from Page 4

Whale Museum's Soundwatch Boater Education Program. Continuing concern about whale-watching impacts has prompted San Juan County to consider additional protection for the orca.

Obviously the whales' survival depends on how well we respond to the salmon crisis. The current work to change land use and development policies and to restore habitat is a start. So, too, may be the creation of marine protected areas, such as the Orca Pass International Stewardship Area proposed for transboundary waters.



Toxic contamination of marine waters is perhaps the greatest threat to the orcas. Since PCBs are so persistent in the marine environment, some researchers are calling for outright bans of certain chemicals and a review of permitted discharges and contaminated sediments. We may be able to adequately manage our insatiable desire to be near the whales. We may even be able to return Puget Sound salmon to numbers that are sustainably harvestable by all. But as long as these chemicals remain in the food chain, whales and other top predators will find themselves less capable of withstanding the other, less lethal stresses of their everyday lives.

PIE project honored

This Spring, the Kitsap County Commission recognized organizations, businesses and individuals working to the help the environment. One of the Action Team's Public Involvement and Education (PIE) contractors was honored, along with nine other recipients.

The **Seabeck Alki Salmon Team** received an award for outstanding youth leadership. The 28-member team ranges from second-graders to high school students in Kitsap County. Salmon Team members participate in water-quality monitoring, planting projects and salmon studies. Work products include a web page, slide show, salmon books and demonstrations at fairs and in classrooms.

For information on how you and your organization can receive PIE funding, please see the announcement on page 1.

Now appearing hourly …on your computer!

Live underwater images from the Port Townsend Marine Science Center

The underwater world of the Port Townsend Marine Science Center is now just a mouse click away and ready for viewing. Video images are captured hourly of the creatures living in and visiting this nearshore habitat at Fort Worden State Park. And you can see it all on the Action Team's website.

The webcam video images allow you to observe a part of our world normally only seen by divers. The images are transmitted to a computer at the center 24 hours a day. Log on at night to see what lurks in the darkness with an infrared-assisted, night-vision camera. Because these cameras use no external light source, you may be able to witness more natural behaviors.

Funding for the camera was made possible through the Public Involvement and Education (PIE) fund. To view the webcam images, go to www.wa.gov/puget_sound and select the link to "Marine Nearshore Environments."

Puget Sound's Health

The Puget Sound Ambient Monitoring Program (PSAMP) is a coordinated effort among state and federal agencies to measure the health of Puget Sound's waters and resources. The program complements monitoring by local governments and citizen volunteers.

Understanding Puget Sound's Pacific herring stocks

Scientific studies coordinated by the Washington state departments of Fish and Wildlife and Natural Resources are improving our understanding of Pacific herring in Puget Sound. Results of two Fish and Wildlife-funded studies provide evidence that the stock of herring that spawns in the spring near Cherry Point (northern Whatcom County) appears to be biologically distinct from other herring stocks in Puget Sound and the Georgia Basin. Results from a third study, funded by Natural Resources, indicate that herring larvae from the Cherry Point stock have lower survival potential than do larvae from other stocks in the region.

The total tonnage of Pacific herring that spawn in Puget Sound declined from about 17,000 tons per year in the late 1970s and early 1980s to about 13,000 tons per year in the late 1990s.

Fish and Wildlife defines 18 stocks of Pacific herring that spawn in Puget Sound (based on differences in the location and timing of spawning). The Cherry Point stock, once the largest of these stocks, has declined substantially in recent years, from more than 4,000 tons of spawning biomass in 1995 to less than 1,000 tons in 2000. This dramatic decline coupled with concerns about the potential effects of industrial development along the Cherry Point shoreline led to a number of investigations of the Cherry Point herring stock.

Fish and Wildlife recently commissioned a pair of studies to investigate:

1. Chemical signatures in the bones of adult herring that provide information on the environment in which the fish hatched and grew (unpublished results presented by Bargmann of Fish and Wildlife & Gao and Joner of the Makah Tribe).
2. Genetic variations in various Puget Sound stocks of herring (unpublished results by Bentzen of the University of Washington & Shaklee of Fish and Wildlife).

Significant results include:

- Ratios of carbon and oxygen isotopes incorporated into the bones of herring soon after they hatched indicate that adult herring spawning at Cherry Point were hatched in a different environment than were adult herring spawning at Port Orchard (central Puget Sound) and Squaxin Pass (south Puget Sound). This indicates that herring hatched at Cherry Point return to that location to spawn. This fidelity to spawning/hatching location implies that herring stocks may be threatened by environmental stresses occurring at the spawning/hatching location.
- Signals of carbon and oxygen incorporated into the bones of herring indicate that 3-year old fish spawning at Cherry Point live in a different environment during the summer prior to their spawning than do herring collected from central and south Puget Sound. This finding supports the hypothesis that Cherry Point herring migrate to the open Pacific Ocean to feed and grow while fish from the region's other herring stocks remain in Puget Sound. The decline of the Cherry Point herring stock might reflect conditions (e.g., predation, food availability) outside of Puget Sound in environments not encountered by other herring stocks.
- Fish and Wildlife's preliminary investigation of the genetic make up of Puget Sound herring (using patterns in DNA) suggests some subdivision of the population and the possibility of multiple stocks. However, Terry Beacham of Canada's Department of Fisheries and Oceans reports that a similar study of herring in British Columbia found small and inconsistent differences between locations over time. Based on the ambiguous results of the two studies, Greg Bargmann of Fish and Wildlife recommends additional sampling and analysis to better define whether Puget Sound stocks consistently exhibit genetic differences (related to subpopulation differentiation).

The findings of these Fish and Wildlife studies underscore the importance of studying the condition of Pacific herring spawning at Cherry Point. One Natural Resources-funded study—more fully reported in a paper by Hershberger and Kocan in the December 2000 issue of Puget Sound Note—investigated the survival potential of herring larvae from Puget Sound, with special attention to the Cherry Point stock. The study found decreased survival potential for Cherry Point herring as indicated by reduced larval hatch weights, greater percentage of larval skeletal abnormalities and insufficient larval yolk reserves at time of hatch. Causes remain undetermined, but Hershberger and Kocan have suggested that decreased age and size of adult spawners might partially explain the reduced fitness of Cherry Point herring larvae.

20th Annual Submerged Lands Management Conference

September 24-27 • Bell Harbor Conference Center, Seattle

Sponsored by Washington State Department of Natural Resources

A continuing forum to discuss submerged lands issues, suggest solutions to conflicting uses and share case studies and other important information. Attendees come from the U.S. and Canada and generally include state and provincial lands managers, representatives of local and federal governmental agencies, representatives of non-governmental organizations, and elected officials who work on submerged lands issues. For more information, call the Department of Natural Resources at (360) 902-1100.

Where have all the herons gone?

Air and ground counts of foraging areas may help solve the mystery

By Donald Norman

With failures of major colonies of great blue herons in 1999 and increasing eagle disturbance of British Columbia and western Washington heron colonies, scientists are concerned that great blue heron populations could crash. We need good counts of heron numbers to determine the status of the region's populations. The Canadian government has expended a great deal of effort in locating and tracking all of the heron colonies in southwest British Columbia.

"Though we have a pretty good idea of where all the colonies are located, we could not be assured that we were counting all the herons," said Ian Moul, a heron biologist from Cortes Island in BC.

Ian and I met last year to discuss a new way to track heron populations: monitoring the foraging grounds of marine-associated heron colonies. Ideally, at the peak of nesting, both adults are struggling to feed hungry beaks in the nest, and even herons at nearby, but unknown, heron colonies should be at the same foraging grounds. Recent studies from Japan on grey herons showed minus tides are the best for foraging.

"Eelgrass beds are where the best foraging occurs," confirms Rob Butler, a Canadian wildlife biologist and recognized as the regional expert on herons. The Action Team and the Washington State Department of Fish and Wildlife provided me with funding to combine an aerial heron count by Fish and Wildlife biologists in the Puget Sound Ambient Monitoring Program (PSAMP) with volunteers sitting through a tidal cycle at locations with many herons. More than 40 volunteers watched the tide go out and in, recording the number of herons seen every 15 minutes, and the directions they flew.

The ground-based volunteers are important because the plane providing the aerial heron counts can't be everywhere at low tide.

Information from locating the most important foraging areas can assist conservation efforts. While many colonies are now protected, eagles may force the herons to move to new sites—some slated for development. By identifying the foraging areas and knowing flight distances to colonies, we can identify woodlots and riparian areas with possible nesting trees.

"We hope to change the Growth Management Act to amend the local Critical Area Ordinances (CAOs) to include planning for potential nesting sites. This is the only way to ensure future nesting areas are protected," says Suzanne Krom, a heron activist in Seattle. "Development is threatening herons all over Puget Sound. We must decide how many herons we want, and work to protect that number."

• Donald Norman is a biologist in Seattle. For more information on his project, contact him at Norman Wildlife Consulting at (206) 542-1275 or donorman@aol.com.

Declining Puget Sound fish stocks need protection now to stay off ESA list

Recently, a group of scientists petitioned the National Marine Fisheries Service (NMFS) to review the status of stocks of copper, quillback and brown rockfish, Pacific hake, Pacific cod, walleye pollock, and Pacific herring in Puget Sound to determine if they should be listed under the endangered species act (ESA). The scientists believe genetic or life history differences exist between Puget Sound stocks and stocks throughout the rest of their range. And because of documented declines in Puget Sound, these stocks may be at risk of localized extinction.

To be listed, these fish must be considered either a species or a "discrete population segment" (DPS) of a species under ESA. Two elements that must be considered are the discreteness of the population segment in question from the population of that species as a whole and the significance of that population segment to the species. Studies and data sources that determine breeding isolation, migration patterns, and any physical or genetic differences suggest a long period of isolation from the rest of the population.

NMFS found that Pacific hake, the three rockfish species and herring all were isolated from larger North Pacific populations to various degrees and are therefore considered DPS species. Cod and pollock were less discrete but show signs of stress due to being at the southern end of their geographic distribution. Hake showed the most marked differences from larger coastal populations.

In all cases, the DPS species usually included all of Puget Sound and Strait of Georgia waters, some extending to Alaska's inland passage. Because other stocks within the DPSs are generally healthy, NMFS decided not to list them at this time.

But the decision not to list doesn't mean we're off the hook. The analysis revealed continued stress on these stocks from habitat loss, pollution and over-fishing. To keep these fish off the ESA list, the Action Team recommends protecting their habitat, supporting strong fishing regulations and establishing marine protected areas.

Restoration

Continued from Page 1

and British Columbia are exploring the benefits of Marine Protected Areas (MPAs). Natural marine biodiversity requires the absence of human influence. A network of existing and proposed MPAs will protect species diversity by protecting the entire habitat. Throughout the world, MPAs have bolstered declining stocks of over-fished species as well as replenished areas outside their boundaries.

Many challenges remain. Population growth in the Puget Sound basin and that population's consumption of resources continues to place enormous stress on our marine environment. Ultimately, marine habitat protection will depend on all of us in Puget Sound to make different choices about what we do in our daily lives.

Puget Sound Water Quality Action Team
P.O. Box 40900
Olympia, WA 98504-0900

PRSRT STD
U.S. POSTAGE PAID
WASHINGTON STATE
DEPT OF PRINTING

Read Sound Waves on the Web!

If you'd like to receive an e-mail reminder when *Sound Waves* is posted on our website, send an e-mail to gwilliams@psat.wa.gov.

Sound Waves is produced quarterly by the Puget Sound Water Quality Action Team.

If you need this document in an alternate format, call (360) 407-7300, (800) 54_SOUND, or the TDD number: (800) 833-6388.

Editor/Designer:
Toni Weyman Droscher
(tdroscher@psat.wa.gov)

Editorial Assistant: Stephanie Lidren

Sound Waves is run on an alcohol-free press using vegetable-based inks.

CALENDAR

August 5, 2001
Noon to 4 p.m.
People For Puget Sound's 10 Year Anniversary Celebration: Picnic for Puget Sound
Golden Gardens Park
• Join People For Puget Sound in celebrating 10 years of protecting and restoring Puget Sound and the Northwest Straits. Activities include: live music, featuring the Toucans, a steel drum band; fabulous food; . walks on the beach with People For Puget Sound's naturalists; and nonstop fun. Tickets are $10 if purchased before August 1; $15 if purchased at the picnic. No charge for kids under 12. Proceeds will benefit Kids For Puget Sound, the only free environmental membership program for kids in Washington.
Contact: Kayleen Rae Dunson at (206) 382-7007 or kdunson@pugetsound.org.

August 11
1 to 4 p.m.
Beach Expo!
Jetty Island, Everett
Sponsor: The Snohomish County Marine Resources Advisory Committee
• Don't miss this final Beach Expo of the summer. Learn about your marine environment. Naturalists lead beach walks, demonstrations and fun activities. For more information, contact Jeff Carter, Snohomish County Surface Water Management, (425) 388-3464 x 4664, email: mrc@co.snohomish.wa.us

August 22
7 to 8:30 p.m.
Introduction to Pacific Northwest Marine Invertebrates
Sponsor: Poulsbo Marine Science Center
Introductory class for adults on invertebrates in Puget Sound. Slides and hands-on with live specimens. Learn how to use field guides efficiently.
$5/Member, $7/Non-Members.
Contact: (360) 779-5549 or www.poulsbomsc.org

September 18-21
5th International Conference on Shellfish Restoration
The Coast Bastion Inn, Nanaimo, British Columbia
• A four-day conference exploring the latest research and best approaches for restoring coastal ecosystems for oysters, clams and other molluscan shellfish.
Contact: Adele Waters, (604) 839-2566 or ICSR2001@home.com.

October 6-7
OysterFest
Mason County Fairgrounds, Shelton
• A community celebration featuring the West Coast Oyster Shucking Championship and other festivities.
http://www.oysterfest.org

Washington WaterWeeks

September 1 through October 14

Chose from more than 150 water- and habitat-related education and action activities throughout the state.

To find out what's going on in your area, go to **www.waterweeks.org.** Or you can request a printed copy of the *WaterWeeks 2001 Adventure Guide* by calling (800) 732-9253.