

Citizen Science Conference: Ecology of Nisqually Basin and South Puget Sound

By Judy Murphy and Daniel Hull

With help from The Russell Family Foundation, Nisqually Reach Nature Center (NRNC) held its second Research Conference for the Nisqually Basin and South Puget Sound on October 21, 2006, at River Ridge High School. Attended by about 50 people, the conference was highly successful in bringing together scientists, students, and community members for a day of lively discussion, exhibits, and pizza. The presentations were understandable, the format informal, and the exchange of ideas exciting for both scientists and non-scientists.



Doug Myers introducing Pat Pringle

“It created a fantastic synergy,” said Daniel Hull, NRNC Director, “in which people could talk about a wide range of topics, with opportunities to ask questions, generate new ideas, and create a better understanding of what we know and do not know about the South Puget Sound area.”

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The conference featured three large-group sessions: phytoplankton ecology of Nisqually Reach, by Gordon Bellevue; volcanic history and hazards of Mount Rainier, by Pat Pringle; and acoustic tagging of steelhead in Puget Sound, by Sayre Hodgson. These sessions were interspersed with smaller-group sessions that focused on water quality and quantity, marine shorelines, and restoration ecology.

NRNC board member Gordon Bellevue opened the conference by presenting highlights of the phytoplankton research he conducted at the Center while a student at St. Martin's University. During 2005, Gordon collected weekly samples of phytoplankton at NRNC using pumps and a catch net, showed slides illustrating what he found, and explained differences among the species of phytoplankton and how their numbers varied throughout the year.

Pat Pringle, former geologist at the Department of Natural Resources and

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Director's Corner...

Hello, supporters of Nisqually Reach Nature Center! This year, 2007, we are very excited here at the Center to be celebrating our 25th year of operation as a nonprofit organization.

Last year shaped up nicely with the success of our environmental education programs at the Center and the success in October of our Citizen Science Conference at River Ridge High School. We attained a new benchmark in 2006: NRNC staff reached 3,094 visitors, including up once again the number of opportunities we had to share our mission with the public.

Coming up on our 25th year is a testament to the commitment of our supporters and the wise management practiced by our board. I am grateful to be working with such a talented group of people and look forward to continuing the path of success we all share.

NRNC Director
Daniel A. Hull

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now a member of the faculty at Centralia College, described the history of Mt. Rainier's volcanic activity as determined by lava flows and other telltale geologic signs in the region. He presented maps detailing how far the lahars (volcanic mudflows) and lava had spread after historical eruptions, noting that some flows had reached as far as Puget Sound, and he pinpointed areas of particular hazard that are now being developed as Seattle's population grows.

One way to measure the health of Puget Sound is to look at the populations of migrating salmon. Sayre Hodgson of the Nisqually Indian Tribe described her efforts to track the movements of migrating steelhead over time using fixed and mobile radio receivers. She found that outmigration of steelhead occurs primarily during May and early June. Most steelhead pass through the Nisqually Estuary quickly (1-2 days), though some stay longer, and some even go back upstream before finally heading to Puget Sound.

Climate change, effects of pollution on shellfish, and student monitoring projects were the topics for the session on water quality and quantity. NRNC board President Douglas Canning discussed the sea level rise predictions for South Puget Sound. Whereas the Pacific Ocean coast is uplifting at rates of up to 2.5 mm/year, the Puget Sound basin is subsiding at rates up to 2.0 mm/year. This disparity exacerbates sea level rise for places like South Puget Sound. Doug showed a schematic depicting the areas around the Port of Olympia that are likely to be flooded in the future as climate change progresses.

With a projected four million people living in the region now and more than five million by 2025, concerns for shellfish health continue. Stuart Glasoe of the Puget Sound Action Team talked about the shellfish areas that are vulnerable to contamination from widespread sources of fecal coliform pollution. Some of the fastest growth rates are expected in rural, shellfish-producing counties. This growth underscores the need for preservation and restoration of forest cover, wetland systems, and continuous riparian buffers, and limits on impervious surfaces are urgently needed.

The second group of presentations concerned the ecology of marine shorelines. Hydrogeologist Wendy Gerstel and wetland plant specialist Jennifer Brown evaluated several different methods of shoreline treatments considered "alternative" to hard armoring or bulkheading. A number of complex and interrelated processes contribute to coastal slope instability, slope retreat, shoreline erosion, and beach degradation throughout Puget Sound. As sea levels rise, these problems will likely be exacerbated. Wendy suggested that county and state shoreline planning and permitting processes should be evaluated and potentially revised to encourage a more thorough characterization of regional and local geology and hydrogeology affecting a site.

The future of the threatened Chinook salmon population depends upon the presence of adequate, suitable



Poster Session



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estuarine and marine habitats in Puget Sound. As Tom Kantz pointed out in his presentation, the hatchery program in the Nisqually River releases about four million juvenile Chinook, which exceeds the high-range of the current estimated capacity for the delta. Maintaining the quality of nearby estuaries and near shore habitat is essential to support hatchery production.

The last group of talks featured restoration ecology, including presentations on fish and bird monitoring in restored tidal areas and efforts to restore the Puget prairies.

The Nisqually Indian Tribe and the Nisqually National Wildlife Refuge (NNWR) are restoring tidal influence to nearly 850 acres of former cattle pasture and farmland in the Nisqually Delta. The first phase, implemented in 2002, reclaimed approximately 40 acres of pasture. Monitoring of the Phase 1 restoration site was started in 2003, and results indicate that the site provided immediate benefit to Nisqually fishes by producing large quantities of prey organisms. Cumulatively, the monitoring data will enable the NNWR and the Nisqually Tribe to make educated predictions about the impact of continued estuary restoration on Nisqually delta fish ecology.

Chris Ellings from the NNWR incorporated the painstaking invertebrate identification data from NRNC. Chris praised the NRNC for our hard work, technical precision and the important contribution the data make to understanding the Nisqually Delta food web.

Migratory bird populations on the restoration marshes also are being monitored, as described by Daniel Hull. In addition, Daniel talked about the importance of citizen involvement in scientific data collection, such as the Center's use of volunteers in the bird monitoring and invertebrate identification studies.



NRNC Volunteers on restoration



Scotch Broom infestation

The Puget prairies, a very different habitat of Puget Sound, are being threatened by widespread development as well as by invasions of non-native species such as Scotch broom. Betsy Kirkpatrick of the University of Puget Sound described her experiments using sucrose sugar and biomass removal to lower the nitrogen content of the soil to enable native plants to re-establish in the Puget prairies. Native wildflower species thrive on the dry, nutrient-poor soils left by the retreating glacier that carved Puget Sound. Scotch broom associates with nitrogen-fixing bacteria in the soil, so it raises the soil's nitrogen level.

This higher nitrogen level has allowed many other non-native species to invade and crowd out the native plants. Carri Marschner, of The Nature Conservancy, talked about efforts to eradicate Scotch broom invasions from Glacial Heritage and Mima Mounds prairies. Scientists hope that through removal of invasive species and restoration of favorable soil conditions the remaining prairies and their beautiful native wildflowers and grasses can be preserved.

Doug Myers, Vice President of the NRNC board and co-organizer of the conference, enthusiastically endorsed the concept of citizen science in planning the meeting. As he said, "By engaging the interest and increasing knowledge among the general public, scientists can enlist support and valuable assistance in working to preserve and restore the vulnerable habitats of South Puget Sound."

For more information about the conference contact the center or visit our website www.nisquallyestuary.org and follow the link to citizen science.

Nisqually Reach Nature Center

The NRNC is a private, non-profit organization incorporated in Washington State, and recognized as a 501(c)(3) organization under the Internal Revenue Code. All contributions are tax-deductible.

The Nature Center is located at Luhr Beach on the west side of the Nisqually Delta. Our facilities are provided by the Washington Department of Fish and Wildlife. No state funds are provided for the operation of the Center.

The Center is open to the public Wednesday, Saturday, and Sunday between 12 and 4 pm.

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NRNC Volunteer Corner Getting a New Start in 2007

With the help of caretaker and education specialist Jeanine Toth, we are in the process of re-energizing our volunteer base for what is going to be our 25th year of operation as a volunteer-run nonprofit. On January 31st 2007 we started volunteer task force meetings designed to give our volunteers the ability to work with others at the Center who share common interests, improve communication to help people accomplish tasks. Other ways we are trying to foster enhanced communication between our volunteers are through e-mail groups and a task force log book. "I wanted to create more energy with our volunteers and the only way I could think of was to give them the power to make changes they would like to see in and around the Nature Center," said Jeanine Toth. "By creating these sub-committees I wanted people to be able to come together, talk about their ideas and then put those ideas into action." Task forces at the Center include:

1. Visitor Center Staff
2. Landscape
3. Research
4. Volunteer/Intern Outreach
5. Environmental Educator
6. Summer Camp Counselor
7. Membership Drive
8. Graphic Design
9. Grant Seeker, Writer
10. Field Seminars/Guest Lectures
11. Special Events Coordination
12. Luhr Lore Newsletter
13. Display/Exhibit/Prop Design
14. Monitoring and Research
15. Web Design/Email Information/My Space
16. Aquarium Maintenance
17. Fundraising and Community Building



Jeanine and Judy work on Luhr Lore.

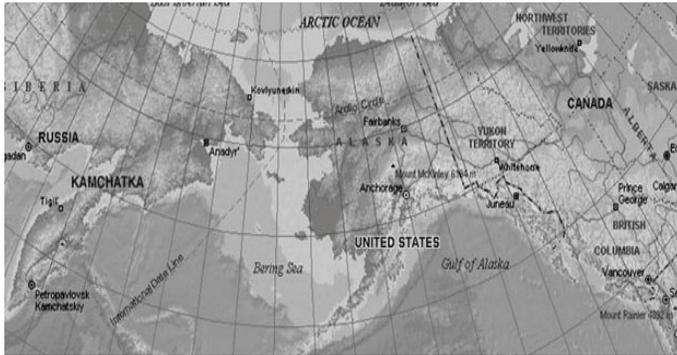
We have had great response from our volunteers who are excited to start working together to make some headway in some of the many areas of work that are needed at the Center. We are always looking for new dedicated volunteers who can assist in our mission. If you or someone you know is interested in helping out at the Center in one of the areas above, please feel free to contact the Center.

**Call 459-0387 or email nrnc@nisquallyestuary.org
Or join our new groups page by sending a message to:
nrnc@yahoo.com. It's a great way to look at a calendar of events
and communicate with others at the Center.**



Kamchatka Visitors Come Again

By Daniel Hull



A little over a year after our visitors from Kamchatka, Russia (see map), were at the Center, we were excited to hear that another group from Kamchatka was planning a visit. On October 19, 2006, we had the opportunity to meet with them. They commented on the fact that those who visited in March, 2005, really appreciated what the Center had to offer and were impressed with the partnerships the NRNC utilizes to accomplish its mission. Most of all, they liked the community involvement and hands-on citizen science programs aimed not only at connecting people with environmental issues but also gaining baseline usable data.

As we had done previously, we provided an introduction to estuaries and near shore habitat using our tidal active aquariums to talk about values and the diversity found in the Puget Sound, and its connection to people. It was very impressive to see the language interpretation that was accomplished during the program. Most of the visitors from Russia had very limited or no English-speaking skills, so everything that was said was interpreted. The Wild Salmon Center spearheads this international partnership and does a great job of working to facilitate communication between our two countries.

Once again, the highlight of the day was getting out on the beach to do a seining. We did not catch salmon, as we had last year, but instead caught a plethora of other fish such as shiner perch, flounder, and sculpin. We all agreed that it is important to look at the whole picture when it comes to the health of near shore habitat. Identifying and measuring forage fish is just as important as getting data on fish

species that have more economic benefit. It is a good idea to look at salmon as an important indicator, but they are still only one piece in a very complex puzzle. We know that if we want to save the salmon we have to save the habitat on which they depend.

Unlike last time, our visitors had a bit more time, and after the seining we were able to get into their van and visit the Nisqually Tribes restoration site. When we arrived, we had enthusiastic discussion concerning the restoration that the tribe completed this summer. The historic road to the old res-



Seining with Kamchatka visitors.

toration site was completely removed and the tide was high enough to start the flooding of the newly opened estuarine habitat. Everyone was excited to see shorebirds, green-winged teal, bald eagle, mallards, and widgeon, all using the newly restored habitat. After everyone got to look at some of the avian species through our spotting scope, we spent time talking about NRNC'S volunteer citizen science monitoring, sharing with them the data collected during monitoring of our vegetation, bird, invertebrate, and plankton populations.

At the end of our 4 ½-hour day we were again given an open invitation to visit Kamchatka to help see beyond boundaries on a map and cultural differences. I only hope that one day someone from NRNC will get the chance to visit and learn from our friends on the other side of the Pacific.

Seals and Sea Lions on Luhr Beach

By *Jeanine Toth*

During the hustle and bustle of the holiday season, the NRNC had its fair share on the beach. Everyone was coming by for a visit, but some didn't make it through. In mid-December, Luhr Beach was visited by a harbor seal pup we liked to call Harry. Harry was having difficulty breathing and seemed very tired and weak. After hours of deliberation and watching over him, the caretakers at the Center, Austin McKinley and Jeanine Toth, Washington Department of Fish and Wildlife officer Carl Klein, and many other concerned hunters and visitors to the beach assisted in helping Harry get to a biologist to be looked after. Early reports suggested that Harry might just pull through with the help of some antibiotics and be able to be released back into the Sound the following day. However, this was not the case, and sadly, Harry died.



Harry, the baby seal was found breathing very heavily on the beach next to the boat launch at the NRNC.

This is not an uncommon occurrence for seal pups at this time of the year. During the first winter in which the pups are weaned from their mothers, it is much easier for them to succumb to viruses and bacteria because they are no longer receiving the antibodies from their mother's milk, which had protected them for the first 3 to 6 weeks of their lives. Unfortunately, this was probably what also happened to Harry; especially right after all of the extremely cold weather we had in the mid-December windstorm.

Pinnipeds (seals, sea lions, and walruses) spend part of their lives in the water but give birth and nurse young on land. The term "pinniped" is derived from the Latin word for winged, which is *pinna*, and *ped*, meaning foot. Harbor seals, *Phoca vitulina*, are the only pinnipeds that breed along Puget Sound, usually from July through September.

California sea lions give birth to one pup from late May through late June, and breeding then occurs in July. This usually does not occur anywhere in the Puget Sound. Instead, sea lions migrate south through Washington in March and April and on through Oregon in April and May to the breeding areas in Southern California and Baja California, Mexico. After the breeding season, California sea lions migrate north, reaching Washington in December. They can continue north as far as British Columbia in February.

In early January, a dead California sea lion was found on Luhr Beach. After a preliminary examination done by Cascadia Research, it was determined that this sea lion had been shot and at least two bullet holes were found in the

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Luhr Lore is published by the Nisqually Reach Nature Center for its members and friends.

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head. The animal was an adult male who was deemed otherwise healthy, in fact they actually found a whole fish in his stomach that had recently been eaten. The animal was tied off with plans to sink it in order for it to decay more naturally, but due to inclement weather this did not occur.

After a little research, I read that this is not an uncommon fate for sea lions. In fact on January 26, 2007, KING 5 News reported that seven sea lions had been shot recently within about a



Daniel Hull with dead sea lion down the beach from NRNC.

month's time. While only one of these found was a threatened species known as the Stellar sea lion and protected under the Endangered Species Act, all marine mammals are protected under federal law and anyone charged with the killing of a sea lion could face tens of thousands of dollars in fines.

Membership Renewal

Last September we held one of our periodic membership/renewal drives and, as always, the response was terrific! That got me to thinking about why few people renew their memberships until we send out letters, and I realized that unless someone writes the date on a calendar, there isn't any easy way to tell when it is time to renew. So I have tried something new. You should find a date in the upper right hand corner of your mailing label. That is the date that your membership is due for renewal. If the date is past, it will be in red. So please, if your date is in red, or if there is no date, consider sending in a check to help keep the Nature Center running. In any event, if this is helpful or not, please let me know.

Thanks,
Gordon Bellevue
Membership Coordinator

What to do if you find a sea lion or seal pup:

(adapted from the Department of Ecology website)

- Remember that pinnipeds naturally use the beach for rest, to give birth or die.
- It is against the law to disturb harbor seals and other marine mammals.
- Do not harass, scare, or separate mothers from offspring.
- Boats should not be closer than 100 yards to marine mammals.
- Humans can stress pups and scare mothers and other adults away, possibly leaving the pup to fend for itself before it is ready.
- Do not try to force a pup into the water. Do not try to feed a seal pup.
- Keep pets and children away from any marine mammal on the beach.
- Stay clear of seal haul-outs during pupping season, which occurs in Washington around July through September.
- Report any violations to the National Marine Fisheries Law Enforcement: 1-800-853-1964
- Dead or dying marine mammals are important for research. Note the exact location and the condition of the animal and call NOAA Marine Mammal Coordinator: (206)526-6733
- If you are truly concerned for an animal's well being, leave it alone and try to contact someone. The number below may be useful for the local area.

Washington Statewide Hotline—1-800-853-1964

For Emergency Situations Involving Possible Human Injuries: 911 or 425-649-4370

- To Report Violations Involving Marine Mammals-Harassment, Capture, Killing:
NMFS Enforcement Hotline 1-800-853-1964
- To Report Live Marine Mammals on the Beach or Beach Cast Carcasses:
 - WDFW- NMFS, Protected Resources Division, Marine Mammal Stranding Coordinator 206-526-6733
 - WDFW, Marine Mammal Investigations Unit 253-589-7235
 - NMFS, National Marine Mammal Laboratory 206-526-4045
 - Cascadia Research (Collective Large Whales) 360-943-7325
 - Thurston County, Animal Services 360-276-4423



THE NEWSLETTER OF THE
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- Priority consideration for Center activities and events
- Volunteer and docent opportunities

To join, just fill out this application and mail it to:
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Special note to our Members: Our membership information is not shared with other organizations.

Yes!! I want to support the Nisqually Reach Nature Center, its goals, and educational programs. I wish to become a Member of the Center as a (check one):

	Membership Category	Annual Dues
<input type="checkbox"/>	Senior/Student	25.00
<input type="checkbox"/>	Individual	35.00
<input type="checkbox"/>	Household	50.00
<input type="checkbox"/>	Supporting	75.00
<input type="checkbox"/>	Patron	100.00
<input type="checkbox"/>	Benefactor	250.00
<input type="checkbox"/>	Sponsor	500.00

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Address:

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