



Padilla Bay Newsletter

A Joint Publication of the Padilla Bay Foundation and Padilla Bay National Estuarine Research Reserve

Spring 2011



Padilla Bay

National Estuarine Research Reserve

Padilla Bay National Estuarine Research Reserve is managed by the Washington State Department of Ecology under the National Estuarine Research Reserve System established by NOAA.

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The Padilla Bay Foundation is a membership-based non-profit organization formed in 1987. Its mission is to help preserve the Padilla Bay estuary in Skagit County, Washington, through support of Padilla Bay National Estuarine Research Reserve.

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Reaching Out With Regional Workshops

Padilla Bay education staff have been busy with several exciting and popular workshops. Environmental educators, high school youth and community volunteers are enjoying the chance to network, share, and learn at events hosted by Padilla Bay.

On January 26, 190 educators from the northwest Puget Sound region gathered at Maple Hall in LaConner for the 12th annual Storming the Sound. Padilla Bay education coordinator, Glen (Alex) Alexander was MC for a lively day of speakers, interactive sessions, good local food, and professional development. Over 30 sponsoring organizations contributed funds for this event.

February 25 was a big day for nearly 100 high school and community college students at the Youth Earth Summit at Skagit Valley College. School environmental clubs from Whatcom, Skagit, Island, and San Juan Counties had the opportunity to share their successes and obstacles while learning from local community experts. Climate Steward volunteers, Padilla Bay staff, and ReSources for Sustainable Development were among the organizers. Funding was provided by the Northwest Clean Air Agency.

Coming soon, on March 12, Padilla Bay and the Skagit Climate Stewards will host a gathering of community outreach volunteers working on climate change projects. The Climate Volunteer Summit will focus on communication about climate change, behavior change, and carrying out successful community projects that reduce greenhouse gas emissions.

All this means many planning meetings, lining up presenters, handling registrations, setting up chairs and tables, filling coffee pots and snack trays, and washing dishes. But the hard work is well worth the effort, and the payoff comes from the excitement and smiles of satisfied participants.

Youth Earth Summit



Storming the Sound 2011



Climate Change Volunteer Summit





Padilla Bay Staff Receive CarbonSmart Awards

Padilla Bay staff were pleased to receive two Department of Ecology awards this winter. The state agency encourages staff to cut their carbon emissions both at home and at work, and our staff took the challenge seriously. The first campaign used an online survey to encourage carbon-saving actions to take at work. We pledged to reduce paper use, increase recycling, carpool, keep lights off in unused spaces, and lower thermostats. The Padilla Bay team received an award for the most new actions taken to reduce carbon emissions at work. Then, the Padilla Bay Cool Climate Team followed suggestions in the book, *Low Carbon Diet*, to make changes at home. From sealing window leaks, drying clothes on a line, and using compact fluorescent bulbs to buying an efficient heat-pump furnace, the staff managed to change their actions at home. Again, this team received the award for the most new actions taken. Well done!

Did You Know?

The Interpretive center has a reference library open to the public Wednesday-Sunday. It contains over 1,000 specialized books, field guides, scientific publications, and teacher resources related to marine and coastal ecology.

The nearly 9,000-acre eelgrass meadow in Padilla Bay is the largest continuous eelgrass meadow on the west coast between southern California and Alaska.

The solar panel array on the Reserve's barn roof is the 2nd largest in western Washington and can produce up to 22 kilowatts/hour that partially offsets our electrical utility costs.

More than 300,000 students, teachers and parents have participated in the Reserve's award-winning education programs. Only an informed public can help protect and preserve Puget Sound.

The new (expanded) parking lot at the Interpretive Center is surfaced with pervious asphalt and the new sidewalk is pervious concrete....both allow rain to penetrate which reduces surface runoff and the need for costly stormwater detention facilities.

An active bald eagle nest is visible from Padilla Bay's upland trail.



How You Can Help

Grassroots involvement is the core of Padilla Bay Foundation's commitment to protect Padilla Bay and support the Padilla Bay Reserve.

Membership in the Foundation means you are contributing directly to environmental education and research right here in Western Washington.

Categories of membership are:

Senior/Student	\$25
Individual	\$35
Family	\$50
School/Organization	\$50+
Supporting	\$75
Sustaining	\$100+
Small Business	\$100+
Sponsor	\$250
Patron	\$500
Steward	\$1000

Send your contribution to:

Padilla Bay Foundation
 PO Box 1305
 Mount Vernon, WA 98273
 (360) 757-3234
 a 501(c)(3) organization

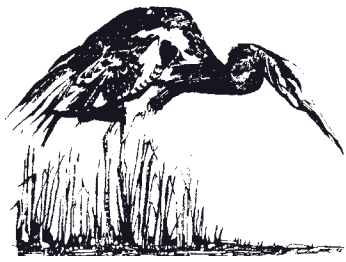
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PADILLA BAY FOUNDATION NEWS



Phase 2 Aquarium Renovation Nears Completion

Last May the first phase of the Reserve's new Aquarium Exhibit renovation opened to rave reviews. In late March the second phase of the project will be complete—just in time for several thousands of students and teachers arriving for the spring education programs. Phase 2 includes an unusual “walk-through” aquarium tunnel and features an immersion into the eelgrass habitat, the prominent resource of Padilla Bay. Exhibit species will include pipefish, tubesnout, gunnels, young salmon, shiner perch, and various invertebrates found in the bay's eelgrass meadows.



The new exhibit also includes a new diorama on the bird life of the bay, with an interactive video kiosk that allows the viewer to scan through video clips of over 220 species native to the region. A new saltmarsh photo display and a second interactive kiosk on the Reserve's research and monitoring activities rounds out the second phase of the room's renovation. Our thanks to the Padilla Bay Foundation and their many donors that contributed nearly \$70,000 to meet the matching requirement for the federal funds for the project. Projects like this would not be possible without the dedicated support of Foundation members and donors. Thank you!

Name _____
 Address _____
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(see reverse)

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Pacific Seaweeds: A Guide to Common Seaweeds of the West Coast, Louis Druehl

Seaweeds show Puget Sound's marine biodiversity like nothing else. Exploring a rocky beach at low tide can reveal a riot of seaweed colors, textures, and shapes. What to make of all this? *Pacific Seaweeds* is sure to help. While this book won't equip you to identify all 600 seaweeds in this region, it gives a good start and will leave you wanting to know more.

Did you know - - that the element iodine was first discovered in kelp, you can use alaria as a spinach substitute in quiche, and some red seaweeds are filaments just one cell wide? Seaweeds vary from single-cells to crusts, blades, little inflated balls, and tubes over 100 feet long. *Pacific Seaweeds* organizes its subject into greens, browns, and reds, further divided by shape and illustrated by drawings and color photographs. Besides descriptions there are interesting facts and a bit about the scientists whose fascination with seaweeds is the very focus of their lives.

Off many Puget Sound beaches, you can see beds of Bull Kelp, a brown seaweed growing 7 inches a day to over 100 feet. These giants create habitat for many other creatures and provide food for people too. As an enthusiastic kelp expert, the author includes recipes after sections on seaweed biology, ecology, conservation, and commercial production.

Green and red seaweeds (many of the latter not red at all) are plants; specifically, algae. But brown seaweeds (e.g. the kelps) are neither plants nor animals but protists, members of the Kingdom Protista. Two-thirds of the seaweeds in our cold temperate region are reds, and they vary incredibly. The appropriately named Rusty Rock, or *Hildebrandia*, resembles a thin reddish stain on beach boulders. Turkish Washcloth (or *Mastocarpus*) is a black tarry blotch on rocks in one phase of its long life but grows into a rubbery sheet. Other red seaweeds have what look like pink stems and leaves and harden by absorbing calcium and magnesium carbonate. There are even red seaweeds that parasitize other red seaweeds.

You may not have been very interested in seaweeds when you picked up this book, but you will be once you've read it through. To get a copy for your next visit to the beach, stop by the Padilla Bay Interpretive Center. (\$24.95)

Review by Tim Manns



Padilla Bay Foundation Membership

Grassroots involvement is the core of Padilla Bay Foundation's commitment to protecting our estuaries and supporting the Padilla Bay National Estuarine Research Reserve.

Members of the Padilla Bay Foundation contribute directly to environmental education and research at Washington State's only Estuarine Research Reserve.

Memberships can be for multiple years. Please consider payment of 2 or 3 years at a time, as this will save the Foundation considerable labor and mailing costs and insure that your dues work harder supporting the programs you care about.

Please fill out the reverse side of this form and join today.

Membership Categories

Senior/Student	\$25
Individual	\$35
Family	\$50
School/Organization	\$50
Supporting	\$75
Sustaining	\$100
Small Business	\$100
Sponsor	\$250
Patron	\$500
Steward	\$1000
Benefactor	\$2000

Hand cast brass critters, mounted at the Interpretive Center, are available to donors of \$1000 and above who would like to be acknowledged in this way.



Presentations for March, April and May 2011

Composters Know All the Best Dirt!



Skagit County Public Works will offer its annual eight week Master Composter/Recycler training Thursday evenings from 6-8:30 pm beginning **March 3rd** at Padilla Bay Interpretive Center. Learn how to make your home zero-waste, maximize your recycling, start your own worm bin, or run an effective compost pile. Participants receive 30 hours of free training and in return, commit 40 hours as community educators about home composting, recycling and waste reduction. Apply online at www.skagitcounty.net/recycle or contact Waste Reduction/Recycling Education Specialist Callie Martin at calliem@co.skagit.wa.us or 360-419-7683.

The Spring Chorus: Birding by Ear

Join naturalist, Libby Mills, listening and looking for neotropical migrant birds. There is no better time of year to enjoy the music. This excursion involves a **slow** walk around the reserve uplands, so you may want to bring a folding chair. Pack warm clothes, binoculars, field guides, and warm drink or lunch. Meet in the Padilla Bay parking lot. Each class limited to 15 participants. **Saturday, March 19 and Saturday, April 16, 8:00-12:00.** Please register online or call the Interpretive Center.



Food Webs and Border Crossings

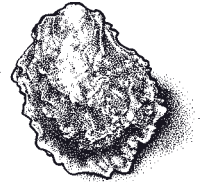
Emily Howe, Ph.D student at the University of Washington's School of Aquatic and Fishery Sciences and NERR Graduate Research Fellow has studied ecological interactions that occur with the crossing of boundaries or ecotones. Emily's talk will examine the role of juvenile English sole and bay pipefish in connecting food webs in Skagit and Padilla Bays. She will explore the life history strategies of these two native fishes, then delve into the ways they are connected to both the marine and upland environments. **Wednesday, March 23, 1:00-2:00.** Please register online or call the Interpretive Center.

Aquarium Tour and Fish Feeding

We're excited about the latest addition to our new aquarium room, a walk-through eelgrass tank. Padilla Bay's aquarist, Mark Olson will offer a behind-the-tanks view of our new system, and share his knowledge about the amazing critters in the tanks. From the biggest bully of a fish to the quiet sea cucumber mopping up the leftovers, aquarium inhabitants have unique habits and stories. **Saturday, March 26, 1:00.** Please call or register online.

Farmers of the Tidelands

What do clean estuaries, healthy watersheds and Barbequed oysters have in common? Nicole Hopper, Education and Outreach staff for Taylor Shellfish will share her enthusiasm and knowledge of the local shellfish industry around Padilla Bay. **Saturday, April 2, 1:00-2:00.** Please register online or call the Interpretive Center.



Urban Merlins of the Pacific Northwest

Savvy survivors, Merlins are smart enough to recognize that both nesting platforms and plenty of accessible prey are available in the growing urban areas of western Washington and British Columbia. This program examines human landscapes and their effects on wildlife communities and Merlin's place in this complex system. Thanks to the support and participation of citizen-scientists like you, The Merlin Falcon Foundation's regional Coastal Forest Merlin Project is investigating this little known predator. Join wildlife biologist, David Drummond for this lively and engaging imaged program! **Saturday, May 28, 1:00-2:30.** Please call or register online.



Wild Edible Plants

Come and experience our annual celebration of late spring's bounty. Join naturalist Marlee Osterbauer in this search for wild edible plants. She will share her extensive knowledge of plant uses and folklore. Weather may be chilly, so dress appropriately. You may want to bring a notebook and pencil. **Saturday, June 4 and Sunday June 5, 2:00-4:00.** Please register online or call the Interpretive Center.



The Breazeale Interpretive Center is open to the public
Wednesday-Sunday, 10:00-5:00.

Staff are available 7 days a week.

Closed Friday, April 22 for state furlough.

Register online or by phone.

www.padillabay.gov

(360) 428-1558



Aquarium Notes

What's That Prickly Ball?

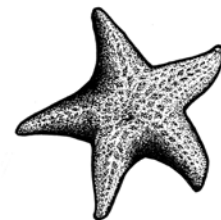
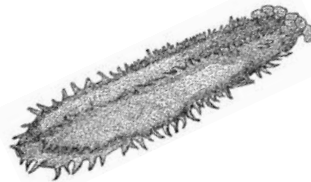
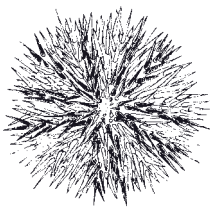
Which name is scarier: Giant Red Sea Urchin or *Strongylocentrotus franciscanus*? Though it looks like a formidable foe, this calm relative of the sea star just rambles along eating algae: lots of algae, in fact.

The largest of our urchins, this one is a true beauty, with bright red spines nearly as long as its hard, round "test" or shell. Using its spines like stilts, and with the help of thousands of tube feet, it crawls very slowly along under-water rock walls, eating kelp and debris. It has no eyes or legs, no head or tail, but it does have a mouth in the center of its underside, surrounded by five teeth. Chomping through a tough piece of kelp is an easy job for this big eater.

This particular sea urchin lives along the Pacific coast of North America, from Alaska to Baja California. It ranges from the low-tide line down to about 90 meters (290 feet) deep. In Washington State we harvest about 475,000 pounds or about 1/2 million dollars worth of red urchins each year. The roe (ovaries) are eaten in many parts of the world, and most of Washington's harvest ends up in Asia.



One of the few urchin predators is the sea otter, who amazingly manages to bypass the sharp spines and crack open the test to reach the soft insides. When Washington's sea otters were depleted by fur traders in the 1800s, the urchin population increased. Many coastal kelp beds were decimated by the unchecked urchins. It took an international treaty banning the hunting of sea otters, and about 70 years for the otters to recover, and now the kelp forests are again lush and productive.



Monthly Youth Programs Offer Fun Learning

Mini Explorers are the 3-5 year old learners. We look at a new topic each month, with stories, games, hands-on observations, art projects, and plenty of action. Call the Interpretive Center to register or register online.



March 2 & 3, 10:00 & 1:00

High Tide, Low Tide - *Life's not so easy for estuary animals when the water goes away. Find out what animals and plants do to cope with the changing tide.*

April 6 & 7, 10:00 & 1:00

Amazing Amphipods- *Often called beach hoppers or sand fleas, these common critters can certainly hop in the sand. Let's go collecting and see how important the little things are.*



May 11 & 12 10:00 & 1:00

Wiggling Worms- *There's more to a worm than slime and wiggles. Meet these important characters up close and see how life goes on under the ooze.*



Junior Ecologists are 6-9 year olds who have fun exploring the estuary. Excursions to the beach, science experiments, games, art projects, and studying life in the bay—this program is guaranteed fun! Call the Interpretive Center or register online.



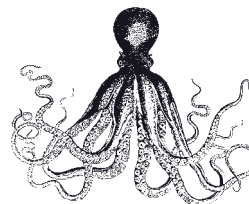
March 4 & 5, 10:30-12:00

Plenty of Plants - *We'd be in big trouble without the producers. Find out all about estuary plants from tiny plankton to giant kelp.*



April 8 & 9, 10:30-12:00

Octopus—*Come explore the mysterious world of these amazing eight-legged creatures.*



May 13 & 14, 10:30-12:00

Round and Round—*Many things in the estuary get used over and over. We'll have a fun time exploring how things like water, air and nutrients are changed and recycled in Padilla Bay.*



Dwarf Eelgrass

In recent years, estuaries in the Pacific Northwest have seen big changes from the introduction of a non-native eelgrass. Native to East Asia, *Zostera japonica* has invaded mudflat habitats from northern California to British Columbia. First documented in Willapa Bay in 1957, *Z. japonica* was probably introduced along with Japanese oysters. Soon after, it arrived in other shellfish growing areas, including Padilla Bay and Samish Bay. Its rapid expansion has changed the habitat structure of estuaries by replacing bare mudflat ecosystems with intertidal eelgrass ecosystems.

However, *Z. japonica* is unusual among invasive species in that it may be beneficial. It provides valuable habitat and food for invertebrates, fish, and waterfowl. Some studies have shown that *Z. japonica* actually increases overall animal diversity and abundance. *Z. japonica* is the principal food of migrating and wintering waterfowl, which prefer the Asian import to our native *Zostera marina*. It grows higher in the intertidal zone where it is available for a longer time each day. It also has higher energy content, and is smaller and easier to handle. In fact, some 19 species of birds in the Pacific Northwest consume some portion of *Z. japonica* making it a rare example of an exotic species that can be beneficial. For these reasons, *Z. japonica* is protected in Washington State.

A Tale of Two Grasses

—by Monte Richardson

Michael Hannam, a PhD candidate at the University of Washington, and a NOAA Graduate Research Fellow, is currently studying the interactions between two species of eelgrass in Padilla Bay. His study site, in the north end of Padilla Bay, offers a unique opportunity to study the conditions that limit the spread of *Zostera japonica*. (See sidebar at left.) The tidal flats in this area are marked by small, closely situated pools and hummocks. *Z. japonica* grows only on hummocks, while the much larger, native *Zostera marina* is observed only in pools. Here, the two species grow near each other but rarely intermix.

There may be conditions in the pools that prevent colonization by *Z. japonica*. To test this idea, Hannam is analyzing and comparing the environmental conditions found in pools and hummocks, including the temperature, chemical properties, and organic matter in the sediment. To add to the study, Hannam is transplanting eelgrass. Plants of each species are planted onto mounds and into pools, either with or without members of the other species. Hannam hopes to compare the importance of plant-to-plant interactions with the importance of environmental conditions.

Hannam monitors the topography that forms these pools and hummocks using ground-based Light Detection and Ranging, or LIDAR. Conceptually similar to radar, LIDAR uses a laser (instead of radio waves) to create a three-dimensional map of the terrain. Hannam hopes to determine how stable this topography is, and how these plants respond to naturally occurring shifts in the terrain.

Early results suggest *Z. japonica* is spreading in many types of terrain with the ability to grow well on the mounds and in pools, as long as *Z. marina* is not present. When growing together with *Z. marina* in either environment, it spreads much more slowly. These results suggest that preserving native eelgrass beds may be a key to limiting the spread of *Z. japonica*.

The work being done by Michael Hannam in Padilla Bay may be the first use of ground-based LIDAR in the study of seagrass and among the first used in intertidal environments. Knowledge gained will contribute to our understanding of physical processes and vegetative trends within Padilla Bay, and provide detailed elevation data in this part of the reserve. This information will be useful for making management decisions. Additionally, Hannam is providing insight into the complex interactions between the native eelgrass *Z. marina* and its invasive counterpart, *Z. japonica*.



Beach Restoration in Padilla Bay

With funding from the Skagit Restoration Initiative, the Northwest Straits Foundation and partners removed 700 cubic yards of rock and concrete from an intertidal area on March Point. This should restore natural beach processes and enhance forage fish spawning habitat in Padilla Bay. WSU Skagit County Beach Watchers helped with pre-construction monitoring. Crews from Skagit County Public Works conducted the removal operations. Backshore planting was also completed and will be carefully monitored for establishment of native vegetation.



Skagit Restoration Initiative (SRI) funding is administered in partnership with the Skagit Marine Resources Committee. SRI funds are designated for projects that restore the shoreline, nearshore, or marine resources of Fidalgo Bay or Padilla Bay. The Department of Ecology Coastal Protection Fund also provided funding for this project.

It is widely believed that declines in seabirds, waterfowl, salmon and other creatures are linked to shifts in the density and distribution of forage fish populations. Surf smelt and sand lance both spawn in intertidal areas of gravel beaches, a habitat that has been changed by structures like bulkheads and rip rap.

For more information about the Skagit Marine Resources Committee and the Northwest Straits Initiative, check their website at www.nwstraits.org.



NORTHWEST STRAITS
marine conservation initiative



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