County: **Skagit County**
Grant No: G1000022

PROJECT TITLE: **WSU STEWARDSHIP PROGRAMS**

DELIVERABLES FOR TASK NO: **TASKS 6.1 - 6.6**

PROGRESS REPORT: [] FINAL REPORT [**X**]

PERIOD COVERED: **July 1, 2009 – June 30, 2010**

DATE SUBMITTED: **June 18, 2010**

Project Summary: Skagit County Marine Resources Committee partnered WSU to accomplish the following tasks:

- Task 6.1 WSU Beach Watchers: Support two WSU Beach Watcher 100 hour core training programs in Skagit County over a two year period. WSU Beach Watcher training took place April 6, 2010 to April 30, 2010 and the second half will occur September 7, 2010 to October 1, 2010. Training was divided between the spring and the fall in hopes to recruit more people. Twelve volunteers received 46.5 hours or training and will receive an additional 52.0 hours of training in the fall Volunteers who have completed 100 hours of professional training will contribute 100 hours of volunteer work including MRC related projects such as native oyster restoration and Fidalgo Bay Day. This year's class already contributed 115 hours of volunteer work since April 30, 2010.
- Task 6.2 WSU Shore Stewards Support, Workshop, and Outreach: Eighty-three permanent or seasonal Skagit shoreline residents have signed up as new Shore Stewards since July 1, 2009. These individuals join 81 existing Shore Stewards in Skagit County, bringing total program enrollment to 164 Skagit Shore Stewards. An invitation to join the Shore Stewards program will be sent to new shoreline homeowners after the list is compiled. The workshop will be postponed until the new full-time WSU Coordinator position has been filled.
- Task 6.3 Shoreline Processes Workshops: Skagit MRC will support and help organize two shoreline processes workshops. The workshops will educate local real estate professionals about shorelines and human impacts to shorelines in Skagit County. WSU Skagit County Beach Watcher staff will adopt WSU Thurston County shoreline curricula to educate local Real Estate professionals about shorelines and human impacts on shorelines. A workshop was supposed to be scheduled prior to June 30, 2010. However, the workshop had to be delayed until a new full-time WSU Beach Watcher Coordinator is hired.
- Task 6.5 Young Beach Stewards Program: Skagit MRC supported WSU Young Beach Stewards 12 hour core training programs for thirty 9-12th grade level students in Skagit County in 2009 and 2010. During the 2009-2010 programs, students gave back more than 375.5 volunteer hours directed toward continuing environmental education, activities, and outreach relating to the health of our marine environments.

This report was funded in part through a cooperative agreement with the National Oceanic and Atmospheric Administration.

The views expressed herein are those of the author(s) and do not necessarily reflect the views of NOAA or any of its sub-agencies.

WSU Beach Watchers / Skagit County
Report to the Skagit County Marine Resources Committee
Deliverables for Task Number 6
Reporting period: July 1, 2009 - June 15, 2010

Project Objectives:
6.1 Training for new WSU Beach Watchers and coordination for current WSU Beach Watchers.
6.2 WSU Shore Stewards Support, Workshop, and Outreach.
6.3 Realtors Shoreline Processes Workshop.
6.5 Young Beach Stewards Program.

Project Results:

Task 6.1 WSU Beach Watcher Training & Coordination.

A total of 82 Beach Watchers have been trained or are in training since the inception of Beach Watchers in 2005. Of these, 2 move with the program to Snohomish County when Skagit and Snohomish County were divided in 2007 and 8 have become inactive.

In spring 2010, the most recent Skagit WSU Beach Watcher training was reorganized into two modular training sessions. The first session was held from April 6 – April 30, 2010. The second session is scheduled from September 7, 2010 – October 1, 2010. Twelve community members were recruited and selected, to become WSU Beach Watchers. The roster is Attachment 1. These individuals join 60 WSU Beach Watchers trained locally in previous years. They received 46.5 hours of training and will receive an additional 52.0 hours of training in the fall module to assure each person has a solid foundation in coastal processes, marine biology, Puget Sound status and high priority issues and skills such as citizen monitoring, education and outreach, and project planning. The training agenda is Attachment 2. Two of the training days were shared training days with classes from other counties (Snohomish and Island). A third scheduled joint training day with Snohomish County Beach Watchers was canceled due to miscommunication on training dates. These days were well received by the trainees and cultivate the volunteers' connection to other Beach Watchers programs in the Northwest Straits region. Over 20 presenters contributed their time and expertise towards this effort.

Interns from the 2010 class have already become active in a number of existing Beach Watcher, MRC, and other partner projects and many have completed specialty-training courses to prepare for summer monitoring and outreach projects. This class has contributed approximately 115 hours since April 30, 2010.

New and veteran WSU Beach Watcher volunteers donated approximately 4,127 hours from July 1, 2009 through June 15, 2010.

Volunteers Who Participated in MRC-related activities (see project list on following page):

Nancy Andrich	Dixon Elder	Karen Leatham
Lyn Bishop	Lin Folsom	Cliff Linster
Chet & Nihla Bradley	Jan Hersey	Christine Longdon
Chris Brown	Pattie Hutchins	Tim Manns
Betty Carteret	Fran Jepperson	Barbara Martyn-Godfrey
Donna Davidson	Lynn Karns	Pamelia Maxwell
Catherine Davis	Barbara Kent	Anne Middleton
Ivar Dolph	Matt Kerschbaum	Jack Middleton
Sue Ehler	David Leatham	Mike Mohundro

Boshie Morris
Antonella Novi
Carol Perry
Erica Pickett
Michele Pope
Danny Rambo
Tom Richards
Eric Shen
Caroline Spehar
Pat Steffani
Sheila Tomas
Lilly Walgamott
Chris Wood

Since July 1, 2009, WSU Beach Watchers have volunteered in many capacities on a variety of education, research, and stewardship projects in Skagit County. From leadership roles to promotion to field work to office support, WSU Beach Watchers have participated in the following projects:

- Beach Naturalist Events (Anacortes, Bay View)
- Public Education at Several Festivals (County-wide)
- Public Youth Education at (Bow, Burlington, Concrete)
- K-8 Classroom/Beach Visits (Sedro Woolley, Burlington/Sunset Beach, Anacortes)
- Water Quality Education (Bow)
- DNR pond cleanup (Cypress Island)
- Baseline Intertidal Monitoring (Anacortes, Samish Island)
- Marine Invasive Species Surveys (select shorelines)
- COASST Seabird Surveys and Stranding Network Activities (select shorelines)
- BEACH Water Quality Monitoring (Bay View/Padilla Bay, DNR Beach/Samish Bay)
- Beach Seining for juvenile salmonids (Cypress Island nearshore, Cannery Beach/Anacortes)
- Skagit Watershed Quest – educational letterbox activity (Anacortes)
- Microplastics Monitoring (select Skagit Beaches)
- WSU Beach Watcher Program Support $^{\Delta}$
- Beach Watcher Training (Padilla Bay and other locations) $^{\Delta}$
- Recreational Crabber Education (escape cord) $^{\Delta}$
- Shore Stewards Program Support $^{\Delta}$
- Restoration [Beach Profile] and Biota Monitoring (Anacortes) $^{\Delta}$
- Green Building / LID Education (Sept 15,2009 WSU Extension Mount Vernon) $^{\Delta}$
- Fidalgo Bay Day Support (Anacortes) $^{\Delta}$
- Young Beach Stewards (Mount Vernon) $^{\Delta}$

Note: projects of special interest to the MRC are denoted with this symbol: $^{\Delta}$

Although seven MRC projects were highlighted for WSU Beach Watcher support: 1) Beach Watcher training 2) Escape Cord education, 3) Shore Stewards recruitment and education 4) March Point Restoration and Biota monitoring and 5) LID workshop 6) Fidalgo Bay Day 7) Young Beach Stewards, it is clear that Beach Watcher involvement exceeds that minimum and contributes appreciably to MRC activities. Photos of volunteers participating in a variety of the projects listed above are compiled in Attachment 3.

Program staff has provided varying levels of support for each project. Many partners have been involved in making these projects happen. Special mention goes to:
Aundrea McBride (Skagit River System Cooperative) - Restoration and Biota Monitoring
Erica Pickett (Skagit MRC, City of Anacortes, WSU Beach Watcher) and Jon Giboney (Skagit MRC) – Fidalgo Bay Day
Lisa Friend (Re-Sources) and Alison Hitchcock (Washington DNR) – Beach Cleanups
Maria Ball (Girl Scouts of Western Washington) – Youth Education
Ann Eissinger (Nahkeeta Northwest) and Sharon Riggs (Padilla Bay) – Marine Invasive Species
Jessica Archer and Jessica Bennett (Washington Dept. of Ecology) – BEACH Water Quality Monitoring

Pete Haase (Skagit Conservation Education Alliance) – Letterbox Activity
Jen Kingfisher (Port Townsend Marine Science Center) – Microplastics Monitoring
Laure Brooks (Mount Vernon High School marine Science teacher) – Young Beach Stewards
Chrys Bertolotto (WSU Beach Watchers / Snohomish) – support of acting interim Skagit County Coordinator
Adam Lorio (WA State Parks) – Beach Naturalists
Expert presenters and volunteers – WSU Beach Watchers training

Beach Watcher Volunteers:

Sue Ehler	Lin Folsom	Pattie Hutchins
Chris Brown	Elizabeth O'Berry	Catherine Davis
Libby Walgamott	Donna Davidson	Helen Harris
Nihla Bradley	Ivar Dolph	Erica Pickett
Chet Beadley	Pat Steffani	Libby Walgamott
Lyn Bishop	Kathy Perkins	Tom Richards

Task 6.2 WSU Shore Stewards Support, Workshop, and Outreach.

Eighty-three permanent or seasonal Skagit shoreline residents have signed up as new Shore Stewards since July 1, 2009. These individuals join 81 existing Shore Stewards in Skagit County, bringing total program enrollment to 164 Skagit Shore Stewards. Each new Shore Steward is mailed a welcome packet, which includes a "Guide for Shoreline Living" booklet outlining ten best management practices for shoreline residents, the educational DVD "Shoreline Living: Protecting our Shorelines and Puget Sound", a letter introducing the shoreline resident to the program, a recent newsletter, and a Shore Stewards Sign. After sign-up they receive regular electronic newsletters that focus on topics of interest to shoreline residents as well as upcoming community events.

Monthly Newsletters and Website Maintenance.

The Skagit Shore Stewards newsletter, "Shore Stewards News", is distributed monthly to keep Skagit County Shore Stewards informed about shoreline processes, marine life, helpful tips and "how-to" articles; in addition they include links to additional information. The newsletter also contains upcoming talks, workshops, classes, native plant sales and other opportunities of interest.

Date	Feature Article Topic
June 2010	*Currently being developed*
May 2010	Harmful Algal Blooms
April 2010	Dealing With Dog Waste
March 2010	Landscaping
February 2010	Rain Gardens
January 2010	Crane Flies
December 2009	Outdoor Cleaning products
November 2009	Eco Friendly Wrapping
October 2009	Taking Care of Fall Yard Waste
September 2009	Fall Yard Care
August 2009	Fish and Pharmaceuticals
July 2009	Yellow Jacket Blues

July through May newsletter issues are compiled in Attachment 4. Monthly issues are indexed on the Shore Stewards website and updated / archived monthly. Newsletters are authored on a bi-county basis and tailored to education, outreach opportunities local and regional events.

Development and Distribution of Workshop Notifications and Educational Materials.

Two Shoreline Workshops will be scheduled during the next grant cycle. The workshop scheduled for the present funding cycle has been delayed due to an interruption of employment for the Interim Beach Watcher Coordinator. Selection of a new Beach Watcher Coordinator is currently in progress. Invited speakers will address locally relevant topics as well as core subjects such as Shoreline Processes & Regulations, Yard Care 101, Water Quality and Native Plants.

The development of educational materials has been focused on the Shore Stewards newsletter to keep shoreline landowners informed of seasonally relevant topics and current events.

Outreach to Skagit County Shoreline residents

A mass mailing to Skagit County homeowners was conducted in August. Lists of Skagit County residents living within 300' of marine shorelines located on Burrows Bay, Turners Bay to Dewey Beach and Samish Bay to Padilla Bay was compiled. 923 cards (see Attachment 5) inviting residents to become Shore Stewards were mailed out. Seventy cards have been returned and added to Shore Stewards.

An additional 11 Shore Stewards were recruited at public outreach events through out the Skagit County area, one email request from web site, and one phone request.

Currently a list of new shoreline homeowners is being compiled. Shoreline properties that have changed hands since the previous outreach efforts will be extend an invitation to join the Shore Stewards program.

Task 6.3 Shoreline Process Workshop for Realtors

Two Shoreline Processes Workshops for Realtors will be held during the next grant cycle. The workshop scheduled for the present funding cycle has been delayed due to an interruption of employment for the Interim Beach Watcher Coordinator. Selection of a new Beach Watcher Coordinator is currently in progress. WSU Skagit County Beach Watcher staff will adapt WSU Thurston County shoreline curricula to educate local Real Estate Professionals about shorelines and human impacts on shorelines.

Task 6.5 Young Beach Stewards Program

Thirty students have participated in the Young Beach Stewards program "From the Mountains to the Sea" curriculum at Mount Vernon High School. Two sessions were held.

The first session of 5 1-½ hour classes started on December 2nd and ended on January 15th. Class schedule is Attachment 6. Eight students from Ms. Brooks' 9th grade at-risk students and one TA participated. Course training was developed to accommodate limited English speaking skills. Subjects covered include Marine Science Careers, Watersheds, Stormwater, Water Quality, Marine Biology, Food Webs, Trophic Levels, Beach Etiquette, Tides, Zonation, Habitats, Adaptations, and Coastal Processes. Todd Woodard of the Samish Indian Natural Resource Department presented Coastal Processes section and additional information on his Marine Science career. The students conducted 2 swale clean-ups at the Mount Vernon High School recording types of trash and amount on both cleanups plus total weight on second swale cleanup; see Attachment 7 for data sheets and Attachment 8 for pictures. Swale cleanup activities and MRC funded field trip secured a matching grant from Northwest Aquatic Marine Educators for an additional field trip for the spring Marine Science class. The University of Washington's Nature Mapping bio-data collection procedure was

also conducted. Six of the eight students attended additional sessions in spring to bring class hours to 12.

The second session of seven 1-½ hour classes and one 1-½ hour class divided between 2 days started on March 15th and ended on June 3rd. Class schedule is Attachment 9. Twenty-two students participated in the Young Beach Stewards program as part of their spring marine science class. Four additional special needs students attended select classes and field trips. "From the Mountains to the Sea" course was coupled with Skagit Fisheries Enhancement Group's class on Stream Ecology and Restoration. A tree planting restoration field trip was included. WSU Skagit County Young Beach Stewards program also partnered with the Padilla Bay Foundations Senior Culminating Project program in a class addressing Marine Science Careers and provided opportunities for the students to select senior culminating projects. Todd Woodard of the Samish Indian Natural Resource Department returned to present the Coastal Processes section and information on his Marine Science career. Course material covered the same subjects listed above with the addition of a Climate Change class presented by WSU Beach Watcher Eric Shen. In class room presentations included handouts, demonstrations, short videos and worksheets.

Two field trips were taken in connection with course material being presented. The first field trip to Padilla Bay Estuarine Reserve included an upland walk, a work sheet for the educational center and a scavenger hunt for organisms found in muddy habitats. The second field trip was to Deception Pass State Park's Rosario Beach. The students donned their Young Beach Stewards hats to share what they had learned with ~40 4th and 5th grade students from Mount Vernon Christian School. The day concluded with the students completing a work sheet about their experience. For attendance on field trips see Attachment 10. More than twelve voluntary hours were provided during the spring session with some students giving back up to 28 hours of volunteer service (see Attachment 11). During the 2009-2010 programs, students gave back more than 375.5 volunteer hours directed toward continuing environmental education, activities, and outreach relating to the health of our marine environments. See Attachment 12 for pictures of activities. Each student has or will receive a certificate verifying they have completed the "From the Mountains to the Sea" course upon receipt of their volunteer hours. See Attachment 13 for certificate.

Students participating in the program:

Rosa Avila	Rachel Pfeffer	Sara Peterson
Coleen Buckles	Emma Pundt	Cody Hunter
Daniel Corona	Adam West	Stephen Vanderkooy
Patrick Garrett	Danene Yakobian	Amy Vasquez
Aaron Hanna	Jazmine Galvan	Samuel Merino
Jessica Holcomb	Patty Hamblin	Samuel Reyes
Anna Johnson	Roman Larson	Ester Gordillo
Monica Longacre	Forest Greenwood	Elvia Vasquez
Leticia Mendoza-Estrada	Marcelina Hilario	David Okara
Nicolas Oritz-Espinoza	Adriana Mckey	Vincent Martinez

Volunteer activities participated in:

- Swale Cleanup
- Salmon Habitat Restoration (Nookachamps Creek)
- Beach Cleanups (Swinomish Channel, Rosario Head, Hope Island)
- Spartina Removal (Birch Bay)
- Science Night (Mount Vernon High School)
- Beach Naturalists (Rosario Head/Deception Pass)
- Padilla Bay Naturalist training (Bay View)

The Mount Vernon High School Marine Science class was one of several slatted to be cut for financial reasons. Due to the success of the program and 42 students already signed up for next year's class, it will be retained another year. See Attachment 14 for student comments about the program.

Attachment 1. WSU Beach Watcher Class of 2010 Photos and Roster

WSU Beach Watcher Class of Spring 2010

Name	Town
Christine Longdon	Stanwood, WA
Barbara Kent	Sedro Woolley, WA
David Waterman	Mount Vernon, WA
David Leatham	Anacortes, WA
Karen Leatham	Anacortes, WA
Carol Perry	Anacortes, WA
Antonella Novi	Anacortes, WA
Mary Ann Palmer	Mount Vernon, WA
Sue Harbour	Mount Vernon, WA
Cliff Linster	Anacortes, WA
Lynn Karns	La Conner, WA
Jourdan Keith	Seattle, WA

WSU Beach Watcher Class of Spring 2010, Roster

Attachment 2. WSU Beach Watcher Spring 2010 Training Agenda

Spring 2010 WSU Beach Watchers Volunteer Training Schedule

all sessions are at Padilla Bay unless noted otherwise

Tuesday, April 6 Bay View Civic Center

9–10:00am **INTRODUCTION & TRAINING PROGRAM OVERVIEW** – Chris Betchley, WSU Extension / Skagit County
10:00–11:00am **IN-CLASS INTRODUCTIONS**
11:15–noon **PRE-TEST**
12:30–1:30pm **TASTE OF BEACH WATCHERS** – WSU Beach Watchers / Skagit County (Class of Fall, 2005 / 2006)
1:30–2:15pm **NAME GAME**
2:30 – 4:00pm **STATE OF THE SOUND –** People for Puget Sound / Mike Sato

Friday, April 9 –

9:00-10:00 **BEACH (DOE)** monitoring program – Jessica Archer, WDOE
10:00-11:15 **WATER QUALITY STATUS OF SKAGIT COUNTY –** Rick Haley, Skagit County Public Works

11:30-12:30 **PARALYTIC SHELLISH POISONING –** Jeanne King, Skagit County Department of Health
1:00-2:15 **SHELLFISH AND AQUACULTURE** – Bill Dewey, Taylor Shellfish Industry
2:30-4:00 **NATIVE OYSTERS** – Paul Dinnel, Western Washington University Shannon Point Marine Center and Skagit County MRC

Tuesday, April 13 –Shannon Point Marine Center, Anacortes

9:00–10:30am **UNDERSTANDING TIDES & ZONATION** – Brian Bingham, Shannon Point Marine Center / WWU
10:45–noon **PUGET SOUND SEAWEEDS –** Kathy Van Alstyne, Shannon Point Marine Center
12:30–2:15pm **MARINE ORGANISMS: FOUNDATION FOR FUTURE STUDY** – Ivar Dolph, WSU Beach Watcher (Class of Fall, 2005)
2:30-4:00pm OVERVIEW OF SPMC RESEARCH & VISIT TO SEA ROOM –

Afternoon field trip: Shannon Point Marine Center Lab

Friday, April 16 –

9:00-9:10 Meet to drop off books, lunches and car pool to Rosario
9:30-12:00 **FIELD INTERPRETATION TECHNIQUES field trip**– Adam Lorio, WA State Parks and Recreation
1:00–4:00pm **FORAGE FISH** – Dan Penttila, Washington Department Fish and Wildlife

Morning Field trip: Rosario Beach

Tuesday, April 20 -

9:00-9:45 **ESCAPE CORD –** Chris Brown (Class of 2009)
9:45-10:00 **MONOFILAMENT RECYCLING** – Sue Ehler (Class of 2009)
10:00-11:15 **MICROPLASTICS MONOTORING-** Jen Kingfisher, Marine Program Educator Port Townsend Marine Science Center
11:30-12:30 **CITIZEN MONITORING** – Chris Betchley, WSU Extension / Skagit County
1:00-2:15 **MARINE MAMMALS** – Howard Garrett, Orca Network
2:30-4:00 **YOUTH EDUCATION TIPS** – William Freitas, WSU Extension / Skagit County

***Friday, April 23 - Joint day with Snohomish County Beach Watcher class, Cougar Room**

canceled due to miss communication on training date
10:00am W**ELCOME / INTRODUCTIONS**
10:15-11:15am **ENDOCHRINE DISRUPTORS** - Jen Sevigny, Stillaguamish Tribe

11:15-12:15pm **DERELICT GEAR REMOVAL** - Jen Sevigny, Stillaguamish Tribe
12:45–2:15pm **OUTREACH TECHNIQUES AND TOOLS** – Stef Frenzl, Snohomish Co. Surface Water Management
2:15–3:15pm **PRACTICUM - Community Outreach**
3:15–3:30pm **WRAP-UP**

Tuesday, April 27– Short Day! Joint training with Snohomish County Beach Watcher class
10:00–12:30pm **ESTUARIES** – Glen "Alex" Alexander, Padilla Bay National Estuarine Research Reserve
1:00–2:15pm **SALMON IN THE NEARSHORE –** Eric Beamer, Skagit River System Cooperative
2:30-3:30pm **NOXIOUS WEEDS & SPARTINA**– Sonny Gohrman, Snohomish County Noxious Weeds

Morning Field Trip: Padilla Bay

Friday, April 30
9:00–11:30pm **WATER QUALITY OVERVIEW and practicum -** Lin Folsom, WSU Beach Watcher (Class of 2005)
11:30–1:00pm **FORAGE FISH HABITAT RESTORATION field trip** – Dan Penttila, Washington Department Fish and Wildlife and Island County Beach Watchers
1:30–2:30pm **POTLUCK LUNCH**
2:30–2:45pm **NATURALIST SPECIALIZED TRAINING** – Pattie Hutchins (Class of 2003)
2:45–3:15pm **TIME TRACKING** – Chris Betchley, WSU Extension / Skagit County
3:30–3:45pm Receive Intern Beach Watcher badges
3:45–4:00pm Sign up Summer Events, Fall training
4:00-5:00pm **PUGET SOUND IS IN YOUR CARE** - Chris Betchley, WSU Extension / Skagit County

Morning Field Trip: Weaverly Spit

fall classes

a. **STREAM RESTORATION CLASS & Field Trip**
b. **SKAGIT WATERSHED & SALMON LIFE HISTORY**
c. **SHORELINE REGULATIONS**
d. COASTAL PROCESSES & Field Trip
e. **SEPTICS 101**
f. **CLIMATE CHANGE AND CLIMATE STEWARDS**
g. **PROJECT PLANNING & TEAM WORK**
h. **PROJECT PLANNING PRACTICUM**
i. **SEABIRD DECLINE – COASST**
j. **IMPACTS OF OIL**
k. **COASTAL NATIVE PLANTS**
l. **FOREST ECOLOGY AND MANAGEMENT**
m. **AGRICULTURE IN SKAGIT COUNTY**
n. **And more…**

Attachment 3. Select photos of WSU Beach Watchers at work.

March Point measurements to improve accuracy of baseline survey with level on USACE benchmark shooting to reference point 148 for start point of beach profile.

Outreach at the Anacortes Farmers Market with Connie Bush showing a curious young lady some brown algae and the uses of algal derivatives in everyday food and household items.

WSU Beach Watcher Boshie Morris manning the Beach Watchers outreach display at the Bivalve Bash.

WSU Beach Watcher Tom Richards giving presentation on Escape Cord at the Skagit County Fair.

WSU Beach Watcher, Pattie Hutchins helping a family explore the many wonders that can be found in and under the algae at Sunset Beach in Washington Park.

A young visitor enjoying the treasures she's found during a Beach Naturalist event at Bay View State Park Beach Expo.

High School Students from the volunteer group “Voices” help clean up Snee-Oosh Beach as part of the International Coastal Cleanup day.

Samish tribal elder Rosie Cayou and her daughter are welcoming the guests during the opening ceremonies for Fidalgo Bay Day.

The crowd gathers as Dan Pentilla of the Washington Department of Fish and Wildlife brings in his beach seine at the end of the Fidalgo Bay Day activities.

Amazed faces can be seen all round at the treasures he brought in.

WSU Beach Watchers searching for Microplastics on Bowman Bay at Deception Pass Park.

Microplastics sorting party requires a good eye and careful examination.

Beach Watcher volunteers jump right in to help Washington State DNR, on Cypress Island, cleanup the pond at the field station.

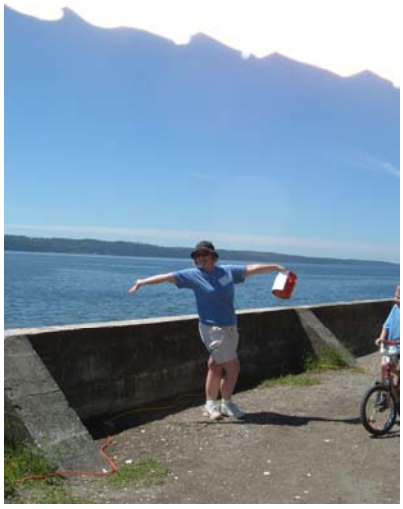
Beach Watchers Tim Manns and Jack Middleton help the Wild Fish Conservancy conduct beach seines for Washington State DNR off Cypress Island.

Intertidal monitoring at Sunset Beach in Washington Park.

Intertidal monitoring at the DNR beach on Samish Island.

WSU Beach Watchers from Island and Skagit Counties join together at the Camocean celebration of World Ocean Day to provide information and beach walks for the public.

Island and Skagit County Shore Stewards also joined the fun, right next to the Island County MRC.



The creation and success of Camocean is due mostly to the efforts of a 2010 Skagit County WSU Beach Watcher, Christine Longdon. This new event celebrating World Ocean Day came to be through her passion for the marine waters, persuasiveness with people and hard work.

Additional descriptions of Beach Watchers Activities for this period can be found at these links:

Project	Link (copy & paste into browser)	Date	Description
Recreational Crabber Education 2009 crabbing season	http://www.goskagit.com/home/article/get_free_sample_of_escape_cord_required_on_all_crab_pots/	7/2/2009	WSU Beach Watcher volunteers hand out free escape cord at Skagit County boat launches
Fidalgo Bay Day, 2009	http://www.goskagit.com/home/article/learn_about_marine_life_at_fidalgo_bay_day/	9/16/2009	WSU Beach Watchers help celebrate Fidalgo Bay Day. The public meet sea creatures through children activities, displays, videos, and food.
	http://www.goskagit.com/home/article/fidalgo_bay_day_connecting_children_with_the_marine_world/	9/20/2009	
Camocean, 2010	http://www.heraldnet.com/article/20100421/NEWS01/704219818/-1/column03	4/21/2010	Skagit County WSU Beach Watcher trainee inspired and developed this first regional celebration of World Ocean Day at Cama Beach State Park on Camano Island. An estimated 1,500 people came out for the day. The public enjoyed beach walks given by Island and Skagit Beach Watchers, educational exhibits, children's activities, in water rescue demonstration, fire boat display, boat rentals at discount prices, guest lecturers, music, and much more.
	http://www.scnews.com/news/2010-05-25/Camano_Scene/Its_a_Camocean_World_Ocean_Day_at_Cama_June_12.html	5/25/2010	
	http://wildaboutwhidbey.blogspot.com/2010_06_01_archive.html	6/8/2010	
	http://www.facebook.com/pages/Camocean-Day/112682372078275?filter=2	6/9/2010	
	http://www.google.com/search?q=Camocean+Cama+Beach&hl=en&rlz=1B3GGGL_en___US345&ei=xRgdTLjGH93nnQetttiSDg&start=10&sa=N	6/11/2010	
	http://www.cwb.org/category/location/cama-beach	2010	
	http://local.mynorthwest.com/theevent.php?id=3165&c=camanoisland	2010	
	http://www.ecy.wa.gov/programs/eap/beach/news.html		

Attachment 4. Shore Stewards News: May 2010- July 2009.

Shore Stewards News

May 2010 **Skagit & Snohomish Counties** **Issue No. 32**

The newsletter was put together by Chris Betchley (Skagit County).

Harmful Algal Blooms (HAB)

From time to time, usually in late summer, great masses of microscopic algae can accumulate in dense visible patches along our coastal regions. These tiny plants called phytoplankton can turn our local waters to the color of tomato soup. Such blooms are all called "Red Tide", though only a few of the many species of plankton that produce "Red Tides" are toxic to humans. They are not the only ones that can cause problems. Plankton blooms are capable of causing toxic results even when the water appears clean and clear. In the Pacific Northwest there are three kinds of plankton that have caused harmful blooms: dinoflagellates, diatoms belonging to the *Bacillariophyta*, and a blue-green algae known as *Cyanobacteria*. Blooms of blue-green algae and large macroalgae or seaweed have caused "Green Tides" that can alter water flow and decrease nutrients, light, and oxygen needed by plankton, other macroalgae, seagrasses and bottom dwelling vertebrates and invertebrates. These "Green Tides" have occurred throughout Puget Sound, the San Juan's and along the Straight of Georgia.

What causes a Bloom?

Algae, like all plants, have certain requirements in order for them to grow. Warm temperatures are needed. They use carbon from CO^2 dissolved in the water to build their cells. Nitrogen is taken directly from the atmosphere and is one of the 17 chemical elements required for plant growth and reproduction. This essential nutrient is found in the green chemical, chlorophyll, which allows plants to capture energy from the sun and make their own food. It is also used in the genetic material DNA and RNA that is so important during periods of rapid plant growth. Nitrogen is the nutrient that limits marine algal growth during the summer months. Trace amounts of phosphorus is also required and is the usually the essential component that runs out first in fresh water habitats during the summer months. As summer wanes and fall begins the decrease in the energy from the sun is the major cause for the decline of algal blooms.

Humans have been changing the amount of phosphorus and nitrogen that is entering our waters. By adding fertilizer to your garden some will run off during storm events into our streams, rivers and marine waters. Farming activities also add these nutrients to stormwater runoff. Failing septic systems are another source and the burning of fossil fuels is major contributor.

Shore Stewards News

April 2010 **Skagit & Snohomish Counties** **Issue No. 31**

The newsletter was put together by Darcy McNamara (Jefferson County) and Chrys Bertolotto (Snohomish County).

Dealing with Dog Waste

Puget Sound is home to over 1.1 million dogs. The bulk of our dogs are in the most urban areas of Puget Sound, at a rate of 1.5 dogs /household. Puget Sound-wide dogs produce almost 400,000 pounds of dog waste per day. Almost all dog waste is 'deposited' in backyards throughout Puget Sound. Left untreated, it can pose many dangers for Puget Sound health, pets and the people around them.

Don't all animals poop though? Why is dog waste singled out for attention in this newsletter? If you consider the numbers of dogs in Puget Sound, it far exceeds the number of wolves, bears, whales or other big mammals you would find in nature and so does the amount of waste they produce. Cats were also considered, but even though there are more cats than dogs, much of the waste is handled in litter boxes and the waste is smaller in volume. Livestock owners must have manure management plans and receive lots of support in creating those plans.

County	No. of Dogs	Waste / Day (lbs.)
Island	24,544	8,099
Jefferson	10,537	3,477
King	524,723	173,158
Kitsap	66,486	21,940
Mason	19,347	6,385
Pierce	206,768	68,233
San Juan	7,351	2,426
Skagit	31,478	10,388
Snohomish	177,286	58,504
Thurston	66,545	21,960
Whatcom	56,299	18,579
Total	**1,191,364**	**393,150**

From Snohomish County Surface Water Management, 2009.

Problems with Dog Waste

Pet Waste can transmit parasites and infectious disease. Pet waste carries a host of pathogens that can cause digestion distress, such as *Giardia*, *Ancylostoma* and *Cryptosporidium*. Some of these pathogens can live in nature for extended period. For example, *Toxocara canis* eggs can live in the soil between 6 months and 4 years.

Pollute ground and surface water: When it rains or snows, all that waste gets washed directly into streams, lakes, ditches or the sound itself. Water that flows into our storm drains is often untreated before it discharges to a nearby water body.

Many Puget Sound streams exceed state limits for fecal coliform, a bacteria that is relatively cheap to test and indicative of other pathogens / bacteria being in the system. These bacteria are in the digestive tracts of mammals and aid in the digestion of food. In addition, manure is a source of nutrients, causing algal growth spurts and the subsequent die off that uses up available oxygen in the water. Dog feces are both a source of fecal coliform and nutrients, far beyond

Fecal coliform bacteria machine

Shore Stewards News

March 2010 **Skagit & Snohomish Counties** **Issue No. 30**

This issue was written by Scott Chase, Island County Shore Stewards Coordinator, adapted from an August 2005 newsletter

Salt Spray and Your Landscaping

None of us would take a rainbow trout from a Cascade Mountain lake and drop it into Puget Sound, expecting it to live. Or try to transplant manila clams to a Lake Washington beach. We all know that certain species are adapted to fresh water and others to saltwater. Yet people continually landscape their beach or bluff properties with the same plants, groundcover and trees that thrived in the yards they had before moving to a shoreline property, then wonder why they seem to be dying despite their best efforts to help them thrive. This edition of the newsletter seeks to explain why certain plants die near the shoreline, and what you can do to ensure a beautiful landscape for your beach or bluff property.

Whenever the winds cause waves and whitecaps, a certain amount of salt spray is inevitable. Some Puget Sound homes are located in harbored areas with little wave action, while others are located where severe winds and waves buffet their home and yard. All of these locations are affected by salt spray to some degree. When the droplets of spray that land on the leaves of trees and shrubs evaporate, sodium and chloride from the salt can penetrate the buds, leaves and stems, the damage being seen when the leaves begin to wilt or turn brown. You probably wouldn't think about misting your indoor plants with saltwater, but nature does it to your shoreline vegetation on a regular basis. Some signs of salt spray damage include browning of needles and leaf burn, particularly on the side that faces the water. In more serious cases, you can actually see the white salt residue left on the plants after the spray has evaporated.

The spray that lands on the ground travels downward through your soil with the rain, causing saline soil. If your yard or garden is particularly close to the beach, separated only by a small shoreline barrier, the seawater during high tides can often reach the roots of your trees and shrubs that are planted close to the barrier. If the salt in the soil is in lower concentrations, the membrane in the plant root cells prevents the salt from entering, allowing only the water into the roots. In higher concentrations, the salt can actually dehydrate the roots by drawing the water out of the cells. High levels of salts can cause compacted soils, particularly when they bind with soil clays. This happens more often in clay soils than sandy soils. Water and oxygen have a harder time penetrating the soil, and water has a more difficult time draining from this compacted soil. This affects not only plant growth but also pest resistance.

Most of our landscape plants are sensitive to salinity in the soil, especially young transplants and seedlings. Heavy winter rains can help remove this salt from the soil, thus reducing the damage from continued exposure, whereas periods of drought and hot weather increase the damage from exposure to the salty soil. There are other species that have adapted to salt spray and salty soil conditions over thousands of years. These we call "halophytic", or salt-loving plants.

Some Thoughts on Shoreline Landscaping

If you think that you might have a problem with saline soil, one way to find out is to take a sample of your soil to a soil test laboratory, which measures the amount of salt in your soil in ppm, or "parts per million". (If you wonder where you can have this done, check with your local WSU Extension office, or your Conservation

Shore Stewards News

February 2010 **Skagit & Snohomish Counties** **Issue No. 29**

This issue was written by Peg Tillery, Horticulture and Shoreline Educator, WSU Kitsap County Extension.

Rain Garden – What Is It, and Why Would We Want One?

What is a rain garden? Do we need one? What benefit does it provide? These are questions many gardeners are beginning to ask as they hear the words rain garden being bantered around. Erroneously some people think a rain garden is a spot in the yard that fills with water and becomes a mini pond for portions of the year, especially in the rainy weather from winter through spring and sometimes even into summer.

What rain gardens really are is a constructed shallow area of a garden where surface rain (called stormwater) that runs off roofs, driveways, sidewalks and the landscape can linger for a day or two and be filtered and absorbed by soil and plants rather than being channeled away from the land to whoosh and rush out into our streams, lakes and into Puget Sound through stormwater pipes. Plants and materials in a rain garden aid in removal of pollution. Water that stays on the land also recycles into the air replenishing groundwater and water cycles.

The Rain Garden Handbook from Washington State University Pierce County Extension http://pierce.wsu.edu/Lid/raingarden/Raingarden_handbook.pdf is a step by step guide for home gardeners. The handbook can be downloaded for free from the link.

WSU Skagit County Extension and Washington Sea Grant have launched the Rain Garden Mentor Program in Puget Sound. Find Skagit's at http://raingarden.wsu.edu/Skagit.html where individuals and groups can register rain gardens they've installed on their properties or in their communities. The website includes tips and helpful links and information about rain gardens.

Rain gardens can cost between $500 and several thousand dollars to construct. However, installation can occur over time, or a person can decide to build several groupings of rain gardens. For example if you have a shed, garage and house, one year you may want to capture the runoff from just the shed. The next year add the garage and finally add the whole house. Every little bit helps. A single downspout may only need a rain garden as big around as your outstretched arms, easily built with a little shovel time, a handful of plants and a cubic yard of sand and compost mix.

Rain Garden Dos and Don't's

There are a few places not to install a rain garden. Avoid septic drain fields and over the septic tank. Keep at least 50 feet between a rain garden and the septic system or well. Always call before you dig to have the location of all utilities identified. If your property has healthy native soils and abundant native plants, or you live in a forest or naturally vegetated area, building a rain garden may not be for you. You are actually living in a nature-made rain garden already.

Shore Stewards News

January 2010 **Skagit & Snohomish Counties** **Issue No. 28**

This issue was written by Sharon Collman, WSU Educator, Snohomish County. Additional information and resources provided by Cheryl Lovato-Niles, Beach Watcher & Shore Stewards coordinator for Whatcom County. Resources in this newsletter were originally created for WSU Extension in Whatcom County.

What is the Problem with Crane Flies?

Crane flies are generally beneficial two-winged flies that look a bit like large mosquitoes. Despite their somewhat scary appearance, they don't bite, suck blood, or carry diseases. In fact, the adults are harmless and rather comical as they bounce around the landscape and off interior walls. They are also an important food source for birds and other wildlife. The aquatic larvae of many crane flies are indicators of good stream health, and become fish food. Other crane flies are decomposers and help break down decaying organic matter.

Adult crane fly photo from Ken Gray Photo Collection

Two species of crane fly have adapted to feeding on grasses and the roots of some plants. There have been cases where, over a period of several years, they became so numerous that lawns were completely stripped of grass. Bare soil, where there was once lawn, made good media headlines and had a strong impact on the minds of turf-conscious gardeners. Gardeners assume crane fly is the cause of any unhealthy looking lawn. However, serious damage only occurs to some lawns in an area; it often builds up over several years. The exception is when this crane fly is new to an area, or when it arrives with heavily infested sod. There is usually plenty of time to check lawns and intervene if the numbers begin to build. In fact, often even heavy infestations disappear because the eggs dry out or birds, parasitoids, and little organisms in the soil eat the larvae.

Is there any Good News about Crane Flies?

The adults and larvae are great bird food; starlings and robins often completely control lawn populations. There are also a lot of other natural enemies of the larvae that attack them through winter (e.g. native nematodes, microorganisms, parasitoids, frogs, and small insectivorous mammals). Adults are eaten by birds, bats, cats and yellowjackets, etc. Turf researchers in Washington and Oregon say, "Only one in ten lawns will get crane fly, and only one in 100 will need to be treated". With a little effort, you can tell if you have them (see the "numbers game" below) before they get way out of control.

Shore Stewards News

December 2009 **Skagit & Snohomish Counties** **Issue No. 27**

This issue was written by Scott Chase, Shore Stewards Coordinator in Island County.

Outdoor Cleaning Products

Some of the wintertime chores we take part in involve preparing for the summer months ahead. Removing rust from the garden tools that may have been left outside, cleaning your grill, and bringing back the luster to your brass house numbers are just a few of these projects that are normally done outside, where the harmful chemicals from commercial cleaning products can easily run off into Puget Sound. This newsletter will show you how to do these tasks using natural products that are commonly found in the kitchen or laundry, saving money and protecting the health of our marine environment at the same time.

Grill Cleaning Made Simple

One of the dirtiest chores in preparing for the upcoming warm months is cleaning the grills of your BBQ. In desperation, many end up using harsh chemical solutions, such as oven cleaner. There is a simpler solution to this problem, however, that is safer to the environment, and that is the use of washing soda. No, this is not laundry detergent, nor is it baking soda. Washing soda, otherwise known as sodium carbonate, is commonly made from the ashes of plants, and was a staple in our grandmothers' laundry rooms. The high alkalinity of washing soda helps it remove a large variety of stains, particularly when used in laundry detergent mixtures when hard water is present. It is also a great way to remove the baked-on residue on your grill grates. Not all stores carry washing soda; you may need to look around. It is typically found in the laundry products section, and sometimes located near either the "green" detergent section or where they carry other old-fashion products, such as bluing and starch. You will usually find packages made by Arm & Hammer, which is easy to spot. (You don't want the laundry detergents that contain washing soda; look for a package that states it is Washing Soda. It is not expensive.)

Propane grill grate with months of baked-on food, shown at left. Same grate, right, after soaking in washing soda solution for 24 hours and light scrubbing

First, find a location where this messy job can take place. You probably don't want to do it inside, or where children or animals can get into the washing soda solution. Maybe your garage or garden shed. Second, find a container or tub large enough for the grates and any other parts, along with a couple gallons of water. I used a plastic container that was once used to store gift wrapping under the bed, before the lid broke. Place the grills and other parts flat inside the container. Mix 1 cup of washing soda with 2 gallons of warm water. (I used a

Shore Stewards News

November 2009 **Skagit & Snohomish Counties** **Issue No. 26**

This issue was written by Maribeth Crandell, Environmental Educator
Oak Harbor Public Works in Island County

Rewrap Your Holiday Season

Here they come again… the holidays. Ya love 'em and ya hate 'em all at once. I mean I love the prospect of pumpkin pie, turkey with dressing, my Aunt Bonnie's sweet potato casserole with the marshmallows on top, and more pumpkin pie. I love the cool weather and the possibility of snow. There are lights everywhere, hanging from eaves, draped around trees, and dazzling store windows.

That's where the craziness comes in. The stores. And the TV and radio ads that start before Halloween. Americans are driven by consumerism and we go absolutely bizerk at this time of year. We buy gifts, decorate the house, and throw parties with extravagance.

Don't get me wrong. I like decorating and parties and giving and getting presents as much as most folks do. I like to go from store to dazzling store, the smell of cider and sound of carolers singing and bells ringing. I just think we go a little overboard. So try using the 3 the three "Rs" this season, **Rethink, Reduce, Reuse**.

Rethink!

A few years ago I read a book called the ***Hundred Dollar Holiday*** by Bill McKibben, which I highly recommend. You can check it out at the library or read it on-line. His family and friends at church decided to put a limit on their holiday spending just to experience the effect. It took the focus off of buying and put it on creating gifts, doing favorite activities like decorating the tree, making cookies, collecting greenery on walks in the woods as a family event. This seems more meaningful, more sane.

Americans throw away 25% more trash between Thanksgiving and New Years. Recently, I learned that Island County sent 96 million pounds of garbage to the landfill in eastern Washington. 28 million of that *could have been recycled*. Recycling saves money and energy. In this case we *lost* 188 million BTUs, enough electricity for 4,200 homes. That's about half the homes in Oak Harbor. Nationally it amounts to an extra one million tons to the nation's dumps weekly from Thanksgiving to New Year's Day. If we want to provide for the needy, this is a good place to start. The more money we spend on hauling and disposing of garbage the less will be available to provide essential services for those in need.

Shore Stewards News

October 2009 **Skagit & Snohomish Counties** **Issue No. 25**

This issue was written by Scott Chase, Shore Stewards Coordinator in Island County

Leaves are something we both love and hate. In the summer, they provide cooling shade. In early fall, they paint the landscape with a beautiful variety of colors. Later in the season, though, they begin to fall, blanketing our lawns and filling our gutters and downspouts. This issue deals with the options you have for disposing of not only fallen leaves, but also the branches and limbs that come down during the fall storms.

Taking Care of Fall Yard Waste

In the past, one of the rites of fall was to gather all the leaves, branches and downed limbs into a big pile and burn them. It was common to smell the smoke of burning leaves on a sunny fall weekend. Some people still do this in areas it's allowed, and there isn't a burn ban in effect, but this option can be hazardous to your health and the environment. Each ton of vegetation that is burned emits 180 pounds of fine particles, carbon dioxide, sulfur dioxide, nitrogen oxide, and volatile organic compounds into the air. This can be bothersome to some people, and can be physically debilitating to folks with respiratory ailments.

Another common disposal method that we now recognize as being hazardous is dumping the leaves over your bluff, onto your beach or in nearby green spaces. As described in the April 2009 issue of the Shore Stewards News, this discarded waste does not decompose quickly, and can pile up, suffocating plants and the organisms underneath. Fall and winter rains soak the leaves, adding weight to the slope that can cause erosion and slides. Dumping of any yard waste over the bluff or onto the beach is a dangerous practice you should avoid at all times.

Photo courtesy of Norm Kosky

One option in disposing of a thin layer of leaves on your lawn is to mow them with your mulching mower, lowering your blade height to about 2". You may need to make a few passes to shred the leaves, and you may need to remove some of the leaf layer to avoid smothering the lawn, which can cause die-back and make the lawn more susceptible to diseases. A light amount of these shredded leaves will decompose, adding nutrients to your soil. Shredded leaves also make great mulch for use around shrubs and trees, or in your vegetable garden. The leaves will retard the growth of weeds, protect against winter freeze, maintain soil moisture, and will improve soil structure and add nutrients as they decompose. One way to create leaf mulch is to put the dry leaves through a chipper-shredder. (Wet leaves can clog the machine.) You can also "mow" a pile of raked leaves, but this works best if you have a grass catcher attachment to contain all the ground-up debris.

Another recommended option for disposing of leaves is to compost them, as they are a good addition to your compost pile. You do not need to shred them, but it may help speed up the rate of

Shore Stewards News

September 2009 **Skagit & Snohomish Counties** **Issue No. 24**

This issue was written by Chrys Bertolotto, Shore Stewards Coordinator in Snohomish County

Fall Lawn Care

Lawns are equally loved, and loathed, by American gardeners. This newsletter is for those Shore Stewards who enjoy the look and functionality of a healthy lawn but aren't willing to sacrifice the health of Puget Sound to get it. You can grow a beautiful lawn using minimal water, pesticides and fertilizers.

Fall is the best time of year to make sure that your lawn has the best chance to thrive in the coming season. Healthy lawns are more resistant to disease so this newsletter provides some basic suggestions for the lawn care giver in your family.

The Quick Story about Lawns

Lawns use about 40% of our region's water in the summer. This is when supplies are the lowest and when adult salmon, wildlife and people need water most. It's also when municipal water rates are the highest.

Chemical use on our lawns has been tied to both contaminants in our stream and increased cancer risk. Federal scientists studied Western Washington urban streams and found that 23 were contaminated with pesticides used by homeowners. Rainwater can wash bug and weed killers from our lawns into streams, lakes and then Puget Sound.

In addition, pesticides may not be good for you, your kids or your pets either. In a science journal review of 98 studies related to the use of weed and bug killers, half the studies found an increased risk of cancer. In addition, safe disposal of unwanted pesticides costs you, the ratepayer, lots of money!

Testing Your Soils

The foundation for a low-care healthy lawn is healthy soil. Healthy soil is rich in organic matter and chock-full of microorganisms and earthworms. Roots spread and can find nutrients needed to grow strong and resilient plants. Determining the quality of your soil, through a soil test, is an important first step. A soil test is a chemical analysis that estimates the soil's ability to supply nutrients.

Benefits of Soil Tests: All plants, including grasses and garden plants, need 16 soil-derived essential nutrients and chemical conditions to grow. It may be necessary to add lime to neutralize very acidic soils or fertilizers to supplement our soil conditions. A soil test will tell you what your soil contains, taking the guess work out of adding supplements. Adding more nutrients than a lawn needs can cost extra money, may harm the plants or contaminate nearby water bodies.

Shore Stewards News

August 2009 **Skagit & Snohomish Counties** **Issue No. 23**

This issue was written by Cheryl Lovato Niles, Shore Stewards Coordinator in Whatcom County

Fish and Pharmaceuticals

In the last few years we've seen an increasing number of news articles about medications ending up in our streams, lakes, and bays. My favorite comic on the topic shows one salmon confiding in the other that while the Viagra makes him want to swim upstream, the Prozac is making him too tired. When medicines aren't fully processed by our bodies, the residue makes its way to our wastewater treatment plants that aren't designed to remove medications and do an incomplete job at best. Medicated livestock are another source. Excess or unprocessed compounds are excreted from their bodies and can enter our waterways with agricultural runoff.

For years one recommended way to dispose of expired or unwanted drugs was to flush them down the toilet. But because drugs are highly soluble in water (so that they will work well in our bodies), this method of disposal is adding to the overall drug load in our environment.

The problem is not really new. Modern and increasingly sensitive water quality tests have brought new awareness of the qualities and quantities of pharmaceuticals loosed into the world. And new research on the consequences to fish, frogs, and other aquatic organisms has uncovered troubling trends.

In 1999 and 2000, the U.S. Geological Survey (USGS) tested 139 streams in 30 states throughout the U.S. for the presence of 95 chemicals including medicines:

- 80% of streams contained 1 or more of these chemicals
- 50% of streams contained 7 or more chemicals
- 34% of streams contained 10 or more chemicals

Image courtesy of Michigan Sea Grant

Of these 95 chemicals:

- 33 are known or suspected to be hormonally active
- 46 are pharmaceutically active (have the ability to affect living matter)

Medications Might be Good for You, but They Can be Bad for Fish

In another recent USGS study, scientists sampled fish populations in streams receiving treated wastewater in the Boulder, Colorado area. They found that the fish downstream of the wastewater outfalls showed signs of endocrine disruption including low male-to-female sex ratios in their overall populations, and individuals having both male and female reproductive organs.

In a laboratory experiment that exposed fathead minnows to treated wastewater from a major metropolitan area, USGS scientists and their colleagues found that the male minnows started producing female egg-yolk protein.

Shore Stewards News

July 2009 **Skagit & Snohomish Counties** **Issue No. 22**

This issue was written by Cheryl Lovato Niles, Shore Stewards Coordinator in Whatcom County

Yellow Jacket Blues

Yellow jackets are remarkable creatures that are easy to admire but hard to love. Their populations bloom with the dog days of summer and suddenly they seem to be everywhere. One of the first things to know about yellow jacket along with paper wasps, their more docile cousins, is that they are beneficial insects. They are predators who eat caterpillars, flies, beetle grubs and other insects who can become pests in our gardens and homes. The appetite of wasps and yellow jackets provides a great service to humanity.

European Paper Wasp on the left, Yellow Jacket on the right.

A pesky part of our outdoor celebrations, they can deliver painful stings if they feel threatened or inadvertently get sipped up with your summer drink. There are numerous pesticides on the market designed to quickly and easily rid us of yellow jackets. This approach to pest control may seem simple and expedient and it certainly is popular, but it has some drawbacks.

If you have problems with wasps, you'll want to figure out whether you're dealing with paper wasps or yellow jackets. Paper wasps are less aggressive insects that tend to steer clear of people - making them easier to live with. Paper wasps are generally about ¾ of an inch, a little longer than yellow jackets. Their bodies are more slender and their legs dangle when they fly. They are usually yellow and dark brown, or mostly yellow with some areas of black. Their nests are smaller and contain open combs facing downward rather than being oval and enclosed. So long as you are not allergic to wasp stings and their nests aren't in high traffic areas, consider tolerating paper wasps and their nests.

Aerial Yellow Jacket Nest
photo courtesy of WSU Extension

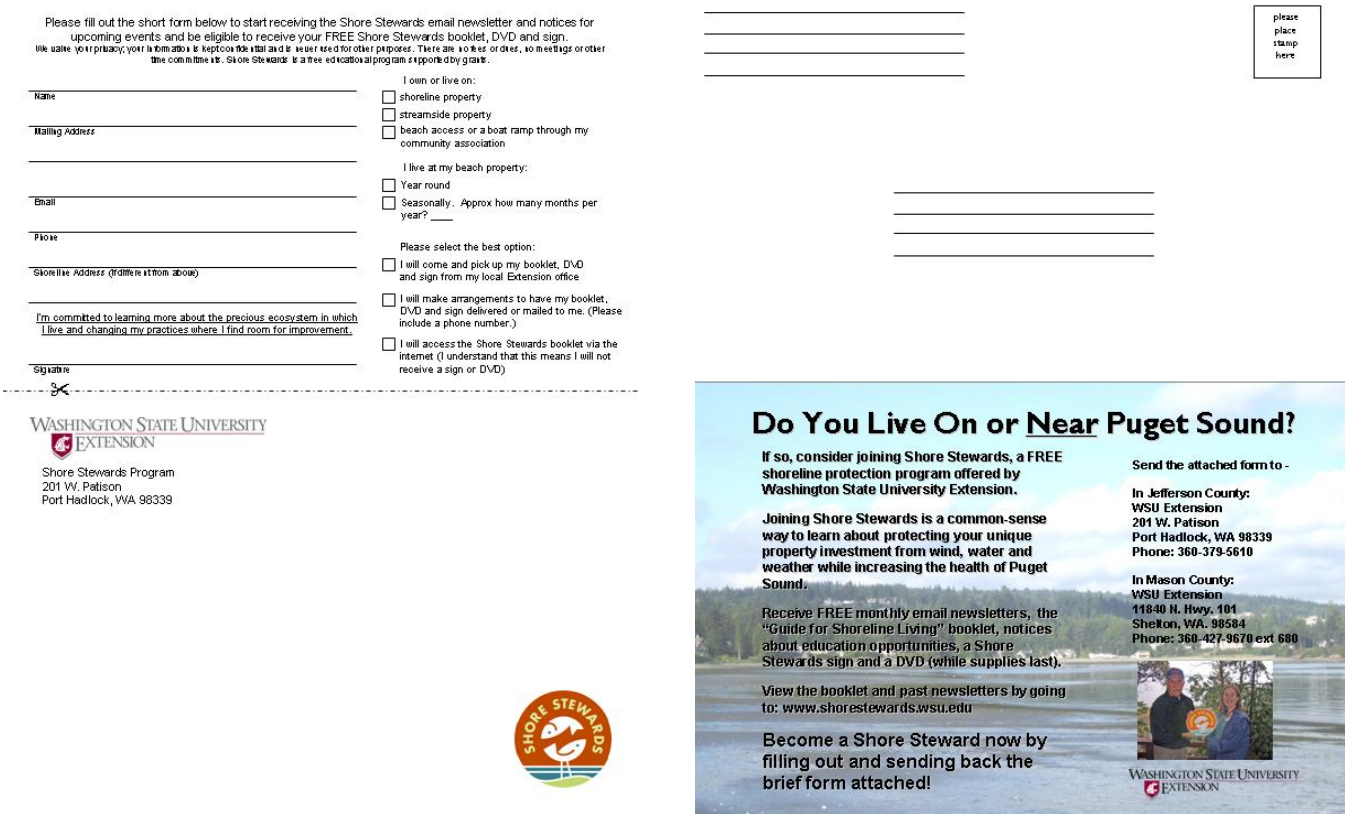
Paper Wasp Nest
photo courtesy of Utah State University Extension

Yellow jackets are shorter and stockier about ½ inch long - black and yellow. Their nests are large paper ovals tucked into shrubbery or built underground in abandoned burrows.

Problems with Pesticides

One concern many people share is that exposure to pesticides like the ones used to kill yellow jackets can harm human health. Pesticides become a part of our indoor air when we store them in our homes, use them in our homes, or track them into our homes on our shoes or our pet's feet. According to the National Pesticide

Attachment 5. Post card mailed to Shoreline homeowners.



Please fill out the short form below to start receiving the Shore Stewards email newsletter and notices for upcoming events and be eligible to receive your FREE Shore Stewards booklet, DVD and sign.
We value your privacy; your information is kept confidential and is never used for other purposes. There are no fees or dues, no meetings or other time commitments. Shore Stewards is a free educational program supported by grants.

Name

Mailing Address

Email

Phone

Shoreline Address (if different from above)

I'm committed to learning more about the precious ecosystem in which I live and changing my practices where I find room for improvement.

Signature

I own or live on:
- ☐ shoreline property
- ☐ streamside property
- ☐ beach access or a boat ramp through my community association

I live at my beach property:
- ☐ Year round
- ☐ Seasonally. Approx how many months per year? ___

Please select the best option:
- ☐ I will come and pick up my booklet, DVD and sign from my local Extension office
- ☐ I will make arrangements to have my booklet, DVD and sign delivered or mailed to me. (Please include a phone number.)
- ☐ I will access the Shore Stewards booklet via the internet (I understand that this means I will not receive a sign or DVD)

WASHINGTON STATE UNIVERSITY EXTENSION
Shore Stewards Program
201 W. Patison
Port Hadlock, WA 98339

please place stamp here

Do You Live On or Near Puget Sound?

If so, consider joining Shore Stewards, a FREE shoreline protection program offered by Washington State University Extension.

Joining Shore Stewards is a common-sense way to learn about protecting your unique property investment from wind, water and weather while increasing the health of Puget Sound.

Receive FREE monthly email newsletters, the "Guide for Shoreline Living" booklet, notices about education opportunities, a Shore Stewards sign and a DVD (while supplies last).

View the booklet and past newsletters by going to: www.shorestewards.wsu.edu

Become a Shore Steward now by filling out and sending back the brief form attached!

Send the attached form to -

In Jefferson County:
WSU Extension
201 W. Patison
Port Hadlock, WA 98339
Phone: 360-379-5610

In Mason County:
WSU Extension
11840 N. Hwy. 101
Shelton, WA. 98584
Phone: 360-427-9670 ext 680

WASHINGTON STATE UNIVERSITY EXTENSION

Attachment 6. Young Beach Stewards 2009 Winter Schedule

December 2nd (Wednesday) 1 hr 30 min
- Marine Science/Oceanographic Careers – Chris Betchley WSU Beach Watchers

December 4th (Friday) 11:50 -1:00
- 1st Swale Clean up
- 134 items removed

December 16th (Wednesday) 1 hr 30 min
- Stormwater/Watersheds – Chris B.
- Songs of the Salish Sea video – wetlands section (5 min 20sec)
- Watersheds-Water Cycle (1 min 21 sec)
- Poisoned Waters – stormwater runoff section (5 min 41 sec)
- Pegboard demo

January 5th (Tuesday) 1 hr 30 min
- Biology / Food Webs /Adaptations/ Beach Etiquette – Chris B.
- Primary Producers & Food Web worksheet
- Carbon Cycle handout

January 7th (Monday) 11:50 -1:00
- 2nd Swale Clean up
- 72 items removed / 3 lbs total

January 13th (Friday) 1 hr 30 min

Tides / Zonation / Adaptation / Habitats - Chris B.

The World between the Tides (23min 28sec)

Substrate examples

Students presented poster board on what they had learned & swale clean up

January 15th (Friday) 1 hr 30 min

Coastal Processes – Todd Woodard Samish Indian Nation Natural Resources Dept

*Classroom hours (7 hrs 30 min)

5 students sitting in on spring session classes for additional training

*Swale Clean ups (2 hrs 20 min)

Attachment 7. Swale Cleanups

Swale Cleanup 12/4/2009:

=Jiak, Marcelina, Elvia U.H
2-4-09 Swale Mount Vernon school
Science Support
1 swale

Cleanup Card

	ITEM	NUMBER	TOTAL
PLASTIC	Bags		12
	Bottles		
	Fishing line/nets		
	Six-pack holders		
	Cigarette filters		
	Straws		
	Other		35
		Total Plastic:	
FOAMED PLASTIC	Cups		
	Fast-food containers		
	Other		
		Total Foamed Plastic:	
PAPER	Cups		
	Bags		
	Newspaper/magazines		
	Other		9
		Total Paper:	
GLASS	Bottles		
	Pieces of glass		
	Other		
		Total Glass:	
METAL	Cans		
	Bottle caps		
	Other		4
		Total Metal:	
RUBBER	Balloons		
	Tires		
	Other		
		Total Rubber:	
MISCEL-	Pieces of wood		
	Pieces of clothing		
		Total Miscellaneous:	
		Total:	49

58

12-4-09 MVHS swale

Cleanup Card

	ITEM	NUMBER	TOTAL
PLASTIC	Bags		20
	Bottles		6
	Fishing line/nets		0
	Six-pack holders		0
	Cigarette filters		0
	Straws		1
	Other		9
		Total Plastic:	29
FOAMED PLASTIC	Cups		6
	Fast-food containers		0
	Other		0
		Total Foamed Plastic:	6
PAPER	Cups		10
	Bags		0
	Newspaper/magazines		6
	Other		7
		Total Paper:	23
GLASS	Bottles		0
	Pieces of glass		0
	Other		6
		Total Glass:	0
METAL	Cans		3
	Bottle caps		2
	Other		0
		Total Metal:	5
RUBBER	Balloons		0
	Tires		0
	Other		0
		Total Rubber:	0
MISCELLANEOUS	Pieces of wood		2
	Pieces of clothing		0
		Total Miscellaneous:	2
		Total:	85

umbrella worm

Vicente Martinez
Adam West
David Garcia
Samuel Reyes
Samuel Menoo

58

Large Swale pg 1. Large Swale pg 2.

Swale Cleanup 1/7/2010:

Cleanup Card

	ITEM	NUMBER	TOTAL
PLASTIC	Bags	IIII	4
	Bottles	III	3
	Fishing line/nets		
	Six-pack holders		
	Cigarette filters		
	Straws		
	Other	~~IIII~~ ~~IIII~~	10
		Total Plastic:	17
FOAMED PLASTIC	Cups	I	1
	Fast-food containers		
	Other		
		Total Foamed Plastic:	1
PAPER	Cups	II	2
	Bags		
	Newspaper/magazines		
	Other	~~IIII~~ ~~IIII~~ ~~IIII~~ III	18
		Total Paper:	21
GLASS	Bottles		
	Pieces of glass		
	Other		
		Total Glass:	
METAL	Cans	IIII	4
	Bottle caps		
	Other		
		Total Metal:	4
RUBBER	Balloons		
	Tires		
	Other		
		Total Rubber:	
MISCEL-LANEOUS	Pieces of wood		
	Pieces of clothing		
		Total Miscellaneous:	
		Total:	43

Boys/1-7-10 / 58 Adam West 3lbs of trash

Large Swale pg 1.

ESTER, Elvia, Samuel M 1/7/10

3 pounds 2 swales

Cleanup Card

	ITEM	NUMBER	TOTAL
PLASTIC	Bags	IIIIIIIIIII	14
	Bottles	III	
	Fishing line/nets		
	Six-pack holders		
	Cigarette filters		
	Straws		
	Other	I Buldog II	
		Total Plastic:	
FOAMED PLASTIC	Cups	I	3
	Fast-food containers	I	
	Other	Bubble Gum II	
		Total Foamed Plastic:	
PAPER	Cups		
	Bags		
	Newspaper/magazines		
	Other	Milk carton II Receipt III	5
		Total Paper:	
GLASS	Bottles	I	1
	Pieces of glass		
	Other		
		Total Glass:	
METAL	Cans		3
	Bottle caps		
	Other	IIII	
		Total Metal:	
RUBBER	Balloons		1
	Tires		
	Other	I	
		Total Rubber:	2
MISCEL-LANEOUS	Pieces of wood		
	Pieces of clothing	I	
	Fungus	Total Miscellaneous:	
		Total:	29

49 + 29 = 78   79 + 43 = 122

58

Small Swale pg 2.

TA Report on cleanups:

After picking up the swale for the second time we gatherd 3lbs of trash and a total of 43 items. So we have reduced the amount of trash of about 50%. Another thing we did new this time was cleaned up 2 swales instead of one and we still got less trash.

adam West

Student Report on cleanups:

Cleaning UP The Pond

MS. Brooks, Esther Gordillo
Elvia Vazquez, David Okava. Adam West
Marcelina Hilario, Samuel Reyes,
Samuel Merino, Vicente Martinez

The first time we cleaned the pond was Dec. 4 we found a total of 134 pieces of garbage. The second time we cleaned the other pond was Jan. 1 we found a total of 122 pieces of garbage.

The first pond we cleaned we found an umbrella, bucket worms, cup, candy wrapers and many more things... Chris noticed we made a diffrence and came to our class. Chris introduced her self and her carers. we made a watershed

Attachment 8. Pictures of Swale Cleanup

David Okara knee deep in water to retrieve trash.

TA recording data on trash collected.

Samuel Reyes bagging the trash Found.

Removing 5 gallon bucket from stormwater overflow grate.

Elvia, Esther, and Marcelina working closely with science teacher.

MVHS 9th grade Swale Cleanup team.

Attachment 9. Young Beach Stewards 2010 Spring Schedule

March 15th (Monday) 1 hr 30 min
Senior Culminating Project – Marieke Slovin Padilla Bay Nat'l Estuarine Reserve
Marine Science/Oceanographic Careers – Chris Betchley WSU Beach Watchers

April 7th (Wednesday) 1 hr 30 min
Watersheds – Chris B.
Songs of the Salish Sea video – wetlands section (3 min 20sec)
Exercise - Contour Maps Snohomish & Skagit watersheds

April 13th (Tuesday) 1 hr added due to shortened day 4/15 for assembly
Poisoned Waters video - 1 hour 3 min

April 15th (Thursday) 50 min – *shortened day assembly*
Stormwater/Water Quality/Pollution –Chris B.
Water Pollution handout, demo, worksheet
Pegboard demo

April 19th (Monday) 1 hr 30 min
Estuaries – Chris B.
Estuary Padilla Bay – DVD (19min 27sec)
Estuaries handout and work sheet

May 3rd (Monday) 4 hrs
Field Trip Padilla Bay Nat'l Estuarine Reserve - Chris B.
Upland Walk 9:30-10:30
Educational Exhibits at research center 10:45-11:00
Lunch 11:00 – 11:30
Estuarine Walk 11:30 – 12:45

May 7th (Friday) 1 hr 30 min
Tides / Zonation / Adaptation / Habitats - Chris B.
The World between the Tides (23min 28sec)
Vocabulary and worksheet for movie
Substrate examples

May 11th (Tuesday) 1 hr 30 min
Biology / Food Webs / Beach Etiquette – Chris B.
Food Webs & Carbon Cycle handout

May 17th (Monday) 8:45 – 1:15
Field Trip Rosario Head – Adam Lario
Acting as Young Beach Stewards to
~ 40 4th & 5th graders from Mount Vernon Christian School

May 19th (Wednesday) 1 hr 30 min
Coastal Processes – Todd Woodard Samish Indian Nation Natural Resources Dept

June 3rd (Thursday) 1 hr 30 min
Climate Change - Betty Carteret or Chris B.

Attachment 10. Field Trip Attendance Sheet

ATTENDANCE CHART

BROOKS
Mount Vernon High School
TERM 2: PER4 MARINE BIO
5/13/2010

	28 of 28 Students	20 of 100 Days	31 Deception 5/7	32 Padilla 5/3	33 Tree Plant 5/7	34	35	36	37	38	39	40
			5/3/2010	5/4/2010	5/5/2010	5/6/2010	5/7/2010	5/10/2010	5/11/2010	5/12/2010	5/13/2010	5/14/2010	5/17/2010	5/18/2010	5/19/2010	5/20/2010	5/21/2010	5/24/2010	5/25/2010	5/26/2010	5/27/2010	5/28/2010
			M	T	W	T	F	M	T	W	T	F	M	T	W	T	F	M	T	W	T	F
1	Avila, Rosa		✓				✓															
2	Buckles, Coleen		✓		✓		✓															
3	Corona, Daniel		✓		✓		✓															
4	Garrett, Patrick				✓		✓															
5	Hanna, Aaron		✓				✓															
6	Holcomb, Jessica				✓		✓															
7	Johnson, Anna		✓		✓		✓															
8	Longacre, Monica		✓				✓															
9	Mendoza-Estrada, Leticia																					
10	Ortiz-Espinoza, Nicolas		✓				✓															
11	Pfeffer, Rachel		✓		✓		✓															
12	Pundt, Emma		✓		✓		✓															
13	West, Adam						✓															
14	Yakobian, Danene		✓				✓															
15	Galvan, Jazmine		✓		✓																	
16	Hamblin, Patty		✓		✓																	
17	Larson, Roman		✓		✓																	
18	Greenwood, Forest		✓		✓																	
19	Hilario, Marcelina		✓		✓		✓															
20	Mckey, Adriana		✓		✓																	
21	Peterson, Sara		✓																			
22	Hunter, Cody Jake		✓																			
23	Vanderkooy, Stephen				✓																	
24	Vasquez, Amy				✓																	
25	Merino, Samuel		✓		✓		✓															
26	Reyes, Samuel		✓		✓		✓															
27	Gordillo, Ester		✓				✓															
28	Vasquez, Elvia		✓		✓		✓															

AE=Absence,AH=Half Day,AS=Suspension,UA=Absence,UH=Half Day,TE=Excused,TU=Unexcused,OA=School Absence,OI=Infirmary,ON=Not Enrolled

Brent Frazer ✓
Suzana Uriba ✓
Julian Gray ✓
Ross
Haley Chadwick ✓
Mrs. Chadwick ✓

Mrs Still ✓
Mrs Biladeau ✓

Attachment 11. Pictures of Classroom and Volunteer Activities for Spring Marine Science Class

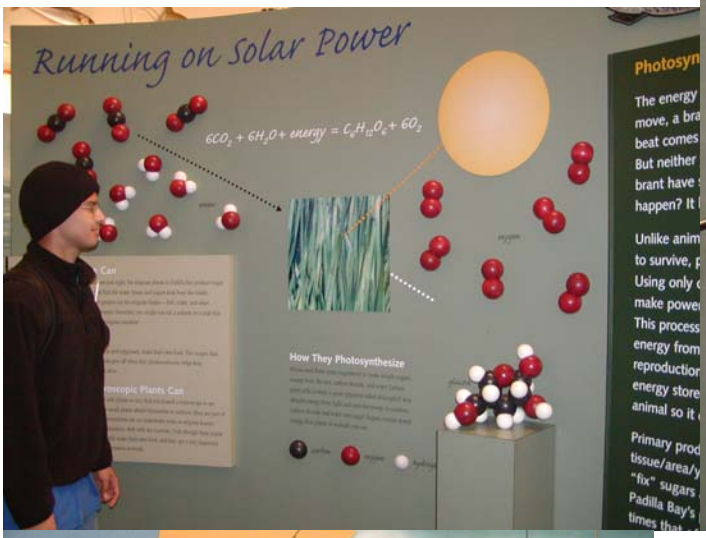
Simulated Stormwater event in classroom demonstration.

Students get to experiment with various cleanup methods for Stormwater Pollution.

...and evaluate the results of the different methods

Padilla Bay Field Trip:

The students started the day with an upland walk.



Explored the Educational Center at Padilla Bay.

Finding and examining the critters and plants found in Muddy Habitats, left a very happy and chilled group of students on this windy May day.

Rosario Head at Deception Pass:

Deception Pass Ranger, Adam Lario, giving practical demonstration of how tides work and showing students some of the inhabitants of this intertidal zone.

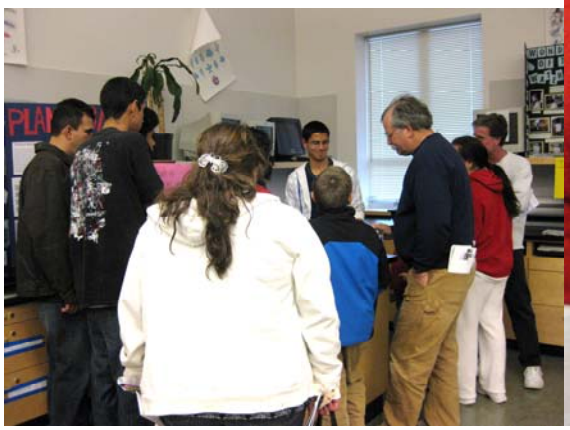
Young Beach Stewards putting on their Beach Naturalist hats for the Mount Vernon Christian School 4th and 5th graders.

Reviewing what they learned about the Rocky Habitats.

Science Night at Mount Vernon High School:

Students inform the public about the many factors that influence Puget Sound marine waters. Using information learned from the Young Beach Stewards program they communicated this message through poster displays as in their Swale Cleanup (upper left), the formation of Puget Sound through glacial processes (lower left), and types of invertebrates found in different Climatic regions (upper right).

Daniel shares what he learned about stormwater pollution with visitors to Science Night by repeating the classroom demonstration

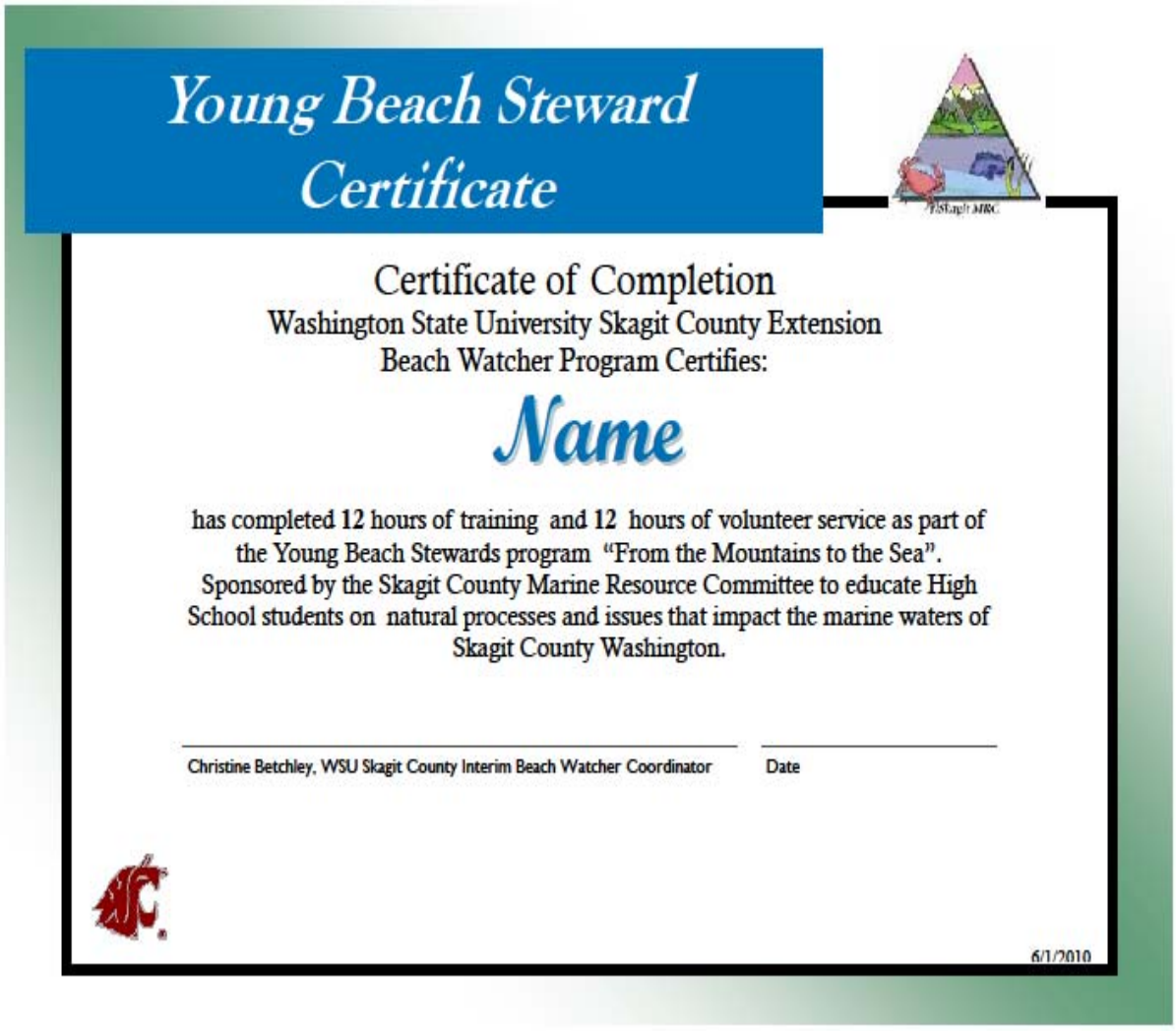


WSU Young Beach Stewards / Skagit County

Name: Danene Chelsea Yakobian

Date	Activity	Task	Location	Prep Hours	Activity Hours	Miles	# People Contacted	Youth Vols	Youth Hours	Comments
3.4.2010	Salmon habitat Restoration	plant trees	Noskachamps creek	2/24/10 1	1	5	katie moyer	yes	2	We planted over 100 trees and shrubs for shade
5.3.2010	beach clean up Swinomish Chanel	clean up trash	Swinomish Chanel	1	3	4	Johnny grassglass	yes	4	I walked up and down the beach and picked up trash
5.6.2010	beach clean up Swinomish Chanel	clean up trash	swinomish chanel	1	2	3	Johnny Grassglass	yes	3	" "
5.13.2010	invasive bush clean up	remove invasive species	Swinomish reservation	1	4	3-4	John grassglass	yes	5	We cut back bushes that had overgrown
5.17.2010	Deception Pass Rosario Head	Naturalist Trainging/ Training	Rosario Beach	3	5	20	Chris Berkley Adam Lorio	yes	8	Tides Activity Each one teach one -research sea anenome
5.20.2010	Beach clean-up Hope Island	clean up trash	Hope Island	1	4	110	Kelly Ofkeneky Johnny G.	yes	5	Cleaned/removed trash from beach
									28	hours

Attachment 13. Young Beach Stewards Certificate



Young Beach Steward Certificate

Certificate of Completion

Washington State University Skagit County Extension
Beach Watcher Program Certifies:

Name

has completed 12 hours of training and 12 hours of volunteer service as part of the Young Beach Stewards program "From the Mountains to the Sea". Sponsored by the Skagit County Marine Resource Committee to educate High School students on natural processes and issues that impact the marine waters of Skagit County Washington.

Christine Betchley, WSU Skagit County Interim Beach Watcher Coordinator

Date

6/1/2010

Attachment 14. Young Beach Steward Thank You Notes

Dear Chris,

It has been a pleasure having you visit our class! I have learned a lot from you. My project I partnered with Coleen Buckles. We were working on our first field trip by helping restore the salmon habitat. We went back to the site and recorded new data. It was really cool to see. We also are currently trying to send a letter to the Skagit Valley Herald. We are still working on it though. For the future I'm not really sure if I'll go into this type of work. I'm pretty set on becoming a physical Therapist. of course I'll try to contribute by recycling, save water and check my household appliances to make sure they have the energy star.

I loved going on the field trips and learning new things. It was very interesting to me. A lot of fun too. ☺ I'm thrilled that I have been able to have this Opportunity. It was very cool getting to know you! I learned so much and I am forever greatful. This has been so much fun!!

Thank you so much ☺

Sincerely,
Rachel Pfeffer

Dear Chris, 6/08/10

Well you meet the class and I was one of the sophmores in the class. I researched information on oil spills and educated the class. I had my information displayed at Science Night, I have almost completed my second year of High School with a 4.0 GPA. I plan to go to WSU for my degree in mathematics. So I might see you on campus in a couple years.

Everytime you were with us I learned many things. From the watersheds/protection unit I learned that watersheds can be as small as a puddle. Beaches are made of different compositions. There ~~is~~ mud, sand, gravel, coble or pebbles are the most common but there are also combinations of those. I learned that planktons make the most percentage of O_2 in the world. Tide pools have many different animals living and diffevent animals live in different levels called intertidal zones, and many more things.

Sincerely,
Daniel C. Corona

Dear, Chris

I learn many things from you and you are a great role model. From the time you came in I learn about your experinces and a little about your life. That helped me get to know you from who you are and background. That is really what the main thing that I really liked about you. Un like the other people we really got to know you. That's why I appreciate that you have come in and teach us about the knolege you have gain through out your yobs. I also really liked your presentation on everything From the pollution waters and the Lab about water and your knowlege on Slamon. Now I know more about Salmons and that there is 60% of the fishes less than use to. I really liked that the fishes lay about 2,000 to 6,000. Eventhough 0 to 2 make it back. This is sad but trees grow better near Salmon streams. But also trees help Salmon attrack bugs, keep water cold, help with erosion. So I am glad you went tree planting to because I do that with my youth group Sometime.

Thank you for everything you taught us.

Sincerely,
Leticia Mendoza
Leticia Mendoza

J.

Chris,

Hello Chris I don't know if you remember me or not but my name is Jazmine. Through this whole time that you were here and taught us about all that you've learned. We have learned so much including invasive species, the ecosystem, chemical pollution, filters, dead zones, bio-accumulation. I really thank you for taking the time to come and help educate us. As the future of our world. Like I told Ms. Brooks we know that you're very busy working at the university yet you come and take time out of your schedule to come and help educate us. We are the future and I understand every little thing impacts our world tomorrow.

Sincerely,
Jazmine

6/9/10

Dear Chris, June 9, 2010

I want to start by thanking you for all the time you spent with our class this semester. You really helped me understand our waters and our enviroment so much more. I have always had an interest in our enviroment, but never really understood how things actually started happening and how they effected us as people on a day to day basis.

When I did my project on my geoducks I worked with my boyfriend who was a commercial diver and harvested them. He was also a native american on the Swinomish Indian Reservation, so when you introduced the ~~Stewards~~ Beach Steward's Project I had a lot of resources to be able to work on it. I was at the reservation alot helping, and cleaning up the area. I thought it was really cool.

I'm not really sure what my future holds at this point. I have so many different interests and passions that I dont know what to do. What I do know is that I learned a lot in this class and from you.

I will be taking this class next years so I hope you will be here too. Have an amazing summer!

With Love,
Danene Yakobian

Dear Chris,

Thank you for coming to our class room and educating us about the ecosystem. The main reason for this letter is to thank you but as well tell you that you are doing a good job. I admire that you have taught me to stand up for other organisms. As well as I have learn certain ways to do something so that I could protect the earth. thanks to you I learn that anything I do will impact the earth no matter how small it is.

thank you and you are a big impact on earth and so please keep teaching us.

thank you!

Sincerely,
Leticia Mendoza
Leticia Mendoza

Dear Chris,

Thank you for coming to our class so much this year. For my project I partnered with Rachel Pfeffer to research salmon habitat restoration. We learned a lot about restoration when we went on the field trip to Nookachamps creek. We made a poster and wrote a letter about ways to prevent polution from killing our salmon. After high school I plan to major in physical therapy and I want to minor is some kind of environmental science.

I also learned a lot from you as well. I learned that our everyday pollutants in some way end back in our water systems. I learned about the run off that end up in streams cause dead zones in the water. Bio-accumulation is something I have not thought about but it effects everything; especially the large predatory marine life. Also I never knew invasive species had such a large effect on the native species. This class was really fun and I am glad I took it! Thank you for being so passionate about your work and the environment. All your work and input made this class even more enjoyable and educational.

Thanks again!

Sincerely,
Coleen Buckles

6/8/10

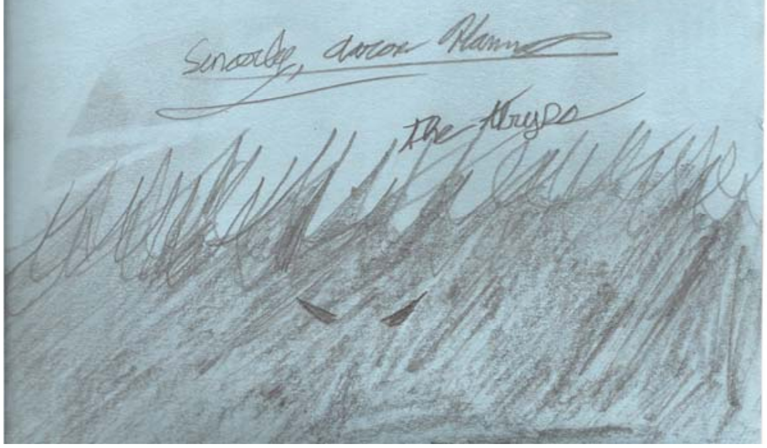
Dear Chris,

I have learned from your lecture, that most of our chemical waste dont get filtered at the sewage. It shocked me when I heard this. I also learned about the water sheds and how climate change effects them

I have accomplish on using less chemical as present. I wish to accomplish more in the future. For my sincere manual final I have chosen to do the jellyfish. Its interesting how their bodies work like how a reproduce and they also reproduce by egg and sperm. Its weird but aquatic life in our, but amazing at once.

So about me. I try or do nothing about our environment. In my part I recycel and save electricity. If I try I would get a electric car and never pay gas again. Woot! Most of the time I will do my part, but theres little power of what I can do.

Sincerely, Aaron Hamm



Dear chris,

My name is Adam West and my project was on the formation of Puget Sound. Some of these accomplishments are planting trees by nookachamps river and also educating people about Glaciers and Puget Sound. The plan for my future is to go to college and become a pilot.

Some of the things I have learned are that all of are actions have an effect. Some other facts I have learned is that the oceans are raising about 1meter per year. From first semester you really explained to me what a water shed was. know I know that we live in a water shed and that we need to take care of it. Another thing that really stood out to me is that the food web is changing and that if one species is effected almost all will get a effect. My last fact is that estuaries are being damage and we need to do something.

My favorite thing we did was the swale clean up. I chose this because it was very intresting how much life and trash was in that pond. Another thing I enjoyed of the cleanup was the competition of how much each team can get of trash.

In conclusion I have learned many things I have learned that everything we do has some sort of effect. Also that by picking up a little trash, I can save a life. So once again thank you for trying to make a diffrence and teaching me about this planet.

Sincerely, Adam West

Dear Chris,

Thank you so much for talking to our class all of the time. I have learned many new and interesting things. I appreciate it.

My project is going well. I just taught my lesson on decreasing habitats and endangered species to Mr. Buelker - one's 5th and 6th grade class on 04/20/10. I really feel that they benefitted from my lesson and activity. I will be joining them, along with all of the other 5th and 6th graders at Lincoln Elementary, on their two day science fieldtrip on 04/22/10 - 04/23/10. I haven't done any service hours yet.

If you would like to contact me you can email me at Sunshinefires@gmail.com.

Sincerely,
Monica Longacre

Dear, Chris,

I thank you Chris for coming to our class and talking about some topic that us student have. what I am learning about my topic about plant relasing Oxygen is less than what I thought. but what I want to learn more is why do the plant release Oxygen under water. also I learned alot about pollution and oil spills. My project is about plant relecsing bubbles which is Oxygen under water. and I would like if you help me more about it and also make me understand a little more about it. I intend to work on it more and guther a whole lot of information about why plants do that. My email is rosaavilaf@yahoo.com.my service hours so far is 1 hour when we went to nuccamp creek and planted trees. And I thank you for all your help we appriciate you for coming in our class

Sincerely, Rosa Avila