Whatcom County
Grant No. G0800003

GRANT TITLE: Northwest Straits Project: Whatcom MRC Administration and Action Projects

TASK NO: 4.3 Pilot Seeding Project

(__) ANNUAL REPORT
(__) WORK PLAN
(__) PROGRESS REPORT No. 1 ☐ No. 2 ☐ No. 3
(__) FINAL PROGRESS REPORT
(__) PROJECT COMPLETION REPORT
(__) SUMMARY REPORT
(X) TECHNICAL REPORT
(__) PROTOCOL
(__) QUALITY ASSURANCE/QUALITY CONTROL

PERIOD COVERED: July 1, 2007 – June 30, 2008

DATE SUBMITTED: June 16, 2008

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

Pilot Clam Seeding Project
Interim Report

Atina Casas
Whatcom County Public Works- Stormwater

June 16, 2008

for
Whatcom County Marine Resources Committee

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

Introduction

Shellfish - those both recreationally and commercially harvested - are key marine resources for Whatcom County. In many Whatcom County shoreline areas, native clams may serve as indicator species and help us gain an understanding of the health of the shellfish resource, water quality impacts, and harvesting impacts. Supplementing diminishing shellfish beds can enhance a resource that provides recreational and commercial benefits to the community.

The goal of the clam seeding pilot project is to evaluate seeding methods and identify challenges in monitoring, site preparation, permitting, seeding, and wave energy/predator control. Information generated by this project will be used to help refine the methods for future enhancement projects with native clams. This interim report describes the procedures used to survey and seed clams and presents a summary of the survey data collected to date.

Background

Since 2004, the Whatcom County Marine Resources Committee (MRC) has been developing and implementing a clam enhancement project, which involves filling data gaps through clam surveys, monitoring water quality, building community awareness of water quality and shellfish harvest issues, and seeding clams at appropriate enhancement plots. The primary areas of focus for clam enhancement are Birch Bay and Drayton Harbor. Both of these areas have suffered from trends in water quality degradation, resulting in shellfish growing areas with of concern, conditionally approved, and prohibited status. In addition, anecdotal evidence suggests that populations of native shellfish may be declining in Birch Bay.

In 2004 and 2005, the MRC completed phases 1 and 2 of the clam enhancement project. In the first phase of this project, clam surveys were conducted at Birch Bay and Semiahmoo Spit to help identify potential locations for clam enhancement plots. In the second phase, a feasibility study was conducted to evaluate other elements (e.g., water quality, tideland ownership, substrate, community interest, clam seed availability, etc.) and narrow the options for enhancement plots. Based on phases 1 and 2, two public tideland areas in Birch Bay (Cottonwood Beach and north of the mouth of Terrell Creek) were selected for this project. These areas are easily accessible and have differing substrates. Cottonwood Beach is composed primarily of sand, while the area north of Terrell Creek contains a mix of cobble, gravel, sand, and shell.

The pilot seeding project design includes establishing small control and test plots (1600 sf), seeding test plots with Manila clams (*Tapes philipinarum),* and monitoring growth and survival for three years at which point the seeded clams will have reached maturity. Although they are non-native, Manila clams are a widespread popular recreational clam that is readily available, easy to seed, and quick to establish. This is also the species the Washington State Department of Fish and Wildlife (WDFW) plants on certain public beaches as part of their clam enhancement program.

The pilot clam seeding study began in May 2007 and is scheduled to continue until the spring of 2010. The dates, number of volunteers, and volunteer hours for the survey and seeding events conducted to date are listed below.

- May 5, 2007 - Pre-seeding Survey (3 hours): 3 Clam Subcommittee members, 12 community volunteers, and 2 Whatcom County Stormwater staff (45 volunteer hours)
- May 15, 2007 - Seeding Event (2 hours): 3 Clam Subcommittee members, 10 Whatcom County Watershed Masters/Beach Watchers students, and 2 Whatcom County Stormwater staff (26 volunteer hours)
- September 8, 2007 - Post-seeding Survey 1 (4 hours): 3 Clam Subcommittee members, 7 community volunteers, 2 Whatcom County Stormwater staff, 2 Skagit MRC members (48 volunteer hours)
- June 7, 2008 - Post-seeding Survey 2 (4 hours): 3 Clam Subcommittee members, 15 community volunteers, 2 Whatcom County Stormwater staff (72 volunteer hours)

Methods

Seeding

Due to logistics and permitting issues, plastic netting or other wave energy/predator controls were not installed for the pilot study. To offset potential losses due to predation and tidal action, large clam seed (10 to 12 mm) were used. Clam seed was purchased from Taylor Shellfish Farms in Shelton, Washington and stored overnight at Taylor's Samish Bay facility in Bow, Washington to keep the seed cool and moist until planting.

On the day of seeding, test plots were located and divided into subplots to ensure uniform distribution and coverage. Field crews seeded each subplot at a density of roughly 30-50 clams/sf, which is comparable to WDFW's seeding density. To avoid desiccation, clam seed was hand broadcast on an incoming tide from the waterward boundary to the landward boundary of the test plots. Field teams walked backwards as they broadcast and avoided walking in seeded areas.

Surveys

Survey procedures were prepared by Whatcom County (2007) following guidance from "Procedures to determine intertidal populations of *Protothaca staminea*, *Tapes philippinarum*, and *Crassostrea gigas* in Hood Canal and Puget Sound, Washington" (Campbell, 1996). The survey approach follows a systematic random design with 4 transects and 16 sample holes per plot.

Surveys are conducted in a waterward direction. Field teams comprise a surveyor, a sampler, and, if additional volunteers are available, an assistant. Rovers knowledgeable about local clam species are also be available to help field teams with shellfish identification. Surveyors establish and mark sample holes, and record information for the sampler. Samplers dig sample holes, identify and measure clams, and provide clam data to the surveyor. The assistant and rover help as needed. Whatcom County staff record GPS coordinates (Trimble GeoXT) at each transect and sample point.

The field teams follow the procedure outlined below at each sample point.

1. place a hoop on the substrate using the toe of the left foot as the guide
2. lay out the tarp next to the hoop
3. dig a one cubic foot hole and place contents on the tarp
4. carefully sieve through the substrate and sort the clams
5. identify the species (common name) and categorize clams into one of four size classes – less than 12.7 mm (0.5 in), between 12.7 and 25.4 mm (0.5 and 1.0 in), between 25.4 and 38.1 mm (1.0 and 1.5 in), and greater than 38.1 mm (1.5 in).
6. record information on the field data sheet
7. carefully return collected organisms to the substrate and refill the sample hole

Results

The numbers and sizes of Manila clams in the test and control plots are presented in Tables 1 and 2, respectively. A graphical display of Manila clam numbers is provided in Figure 1. Prior to seeding, 2 Manila clams were found at Cottonwood Beach and 25 at Terrell Creek, suggesting that perhaps Manila clams prefer the substrate at Terrell Creek. Four months after the seeding event, hundreds of Manila clams were found in the test plots at both areas, most in the <0.5 and 0.50-1.0 size categories. Some Manila clams were also found in the control plots. One year after seeding, 3 Manila clams were found in the Cottonwood Beach test plots and 49 at Terrell Creek test plot. Of these 49, over half were between 1.0 and 1.5 inches, which is the expected size for the Manilas clams seeded in 2007. As in the previous surveys, some Manila clams were also found in the control plots.

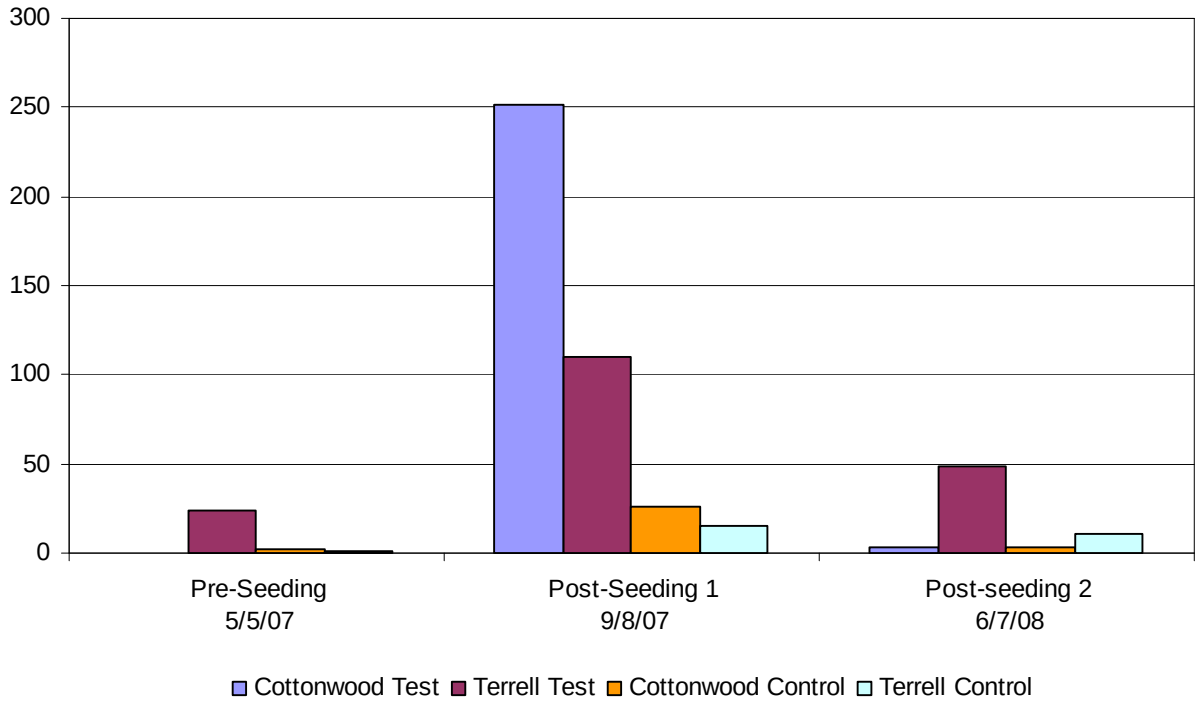
Table 1. Number and Sizes of Manila Clams in Test Plots

Location	Date	Number	Size Category (inches)			
			<0.5	0.5-1.0	1.0-1.5	>1.5
Cottonwood Beach	5/5/07	0	n/a	n/a	n/a	n/a
	9/8/07	251	19	229	2	1
	6/7/08	3	0	1	1	1
Terrell Creek	5/5/07	24	3	8	11	2
	9/8/07	107	35	55	14	3
	6/7/08	49	7	10	25	7

Table 2. Number and Sizes of Manila Clams in Control Plots

Location	Date	Number	Size Category (inches)			
			<0.5	0.5-1.0	1.0-1.5	>1.5
Cottonwood Beach	5/5/07	2	0	1	0	1
	9/8/07	23	23	2	3	0
	6/7/08	3	0	1	2	0
Terrell Creek	5/5/07	1	0	0	0	1
	9/8/07	16	6	8	2	0
	6/7/08	11	1	6	3	1

Figure 1. Manila Clam Numbers by Survey Event



Discussion

Data collected to date indicate that many seeded clams survived and grew during the summer of 2007, but did not survive a full year. During the last survey, many Manila clam shells about 1 inch in size were found at the Cottonwood test plot, although few were found in the Terrell test plot. The reason for the poor survival rate is unknown, but may be attributed to a number of factors. High mortality was anticipated because predator and wave energy control measures were not implemented. Hence, a large percentage of the seeded Manila clams could have been predated or swept out of the area. Other possible factors include competition for space and food, movement out of the study area, and difficult over-wintering conditions. Not accurately locating the plots is another possible, albeit remote, explanation for the low numbers found during the last survey. Since permanent plot markers were not installed, GPS technology was used to find the plots. There is high confidence that the same areas were monitored during each survey, however, because data points from each survey overlap when mapped.

Two more clam surveys are scheduled for this project. It is recommended that the MRC Clam subcommittee convene a meeting with technical experts to discuss findings and determine next steps.

References

Campbell, William W. 1996. Procedures to determine intertidal populations of *Protothaca staminea, Tapes philippinarum*, and *Crassostrea gigas* in Hood Canal and Puget Sound, Washington. Washington Department of Fish and Wildlife.

Whatcom County. 2007. Procedures for Seeding and Surveying Manila Clams (*Tapes philipinarum*).

Attachments

1. Map – Cottonwood Beach
2. Map – Mouth of Terrell Creek
3. List of Volunteers
4. Field Data Sheet – Clam Survey
5. Shoreline Exemption Permit
6. Scientific Collection Permit

MRC Clam Seeding Pilot Project
Cottonwood Beach Test and Control Plots

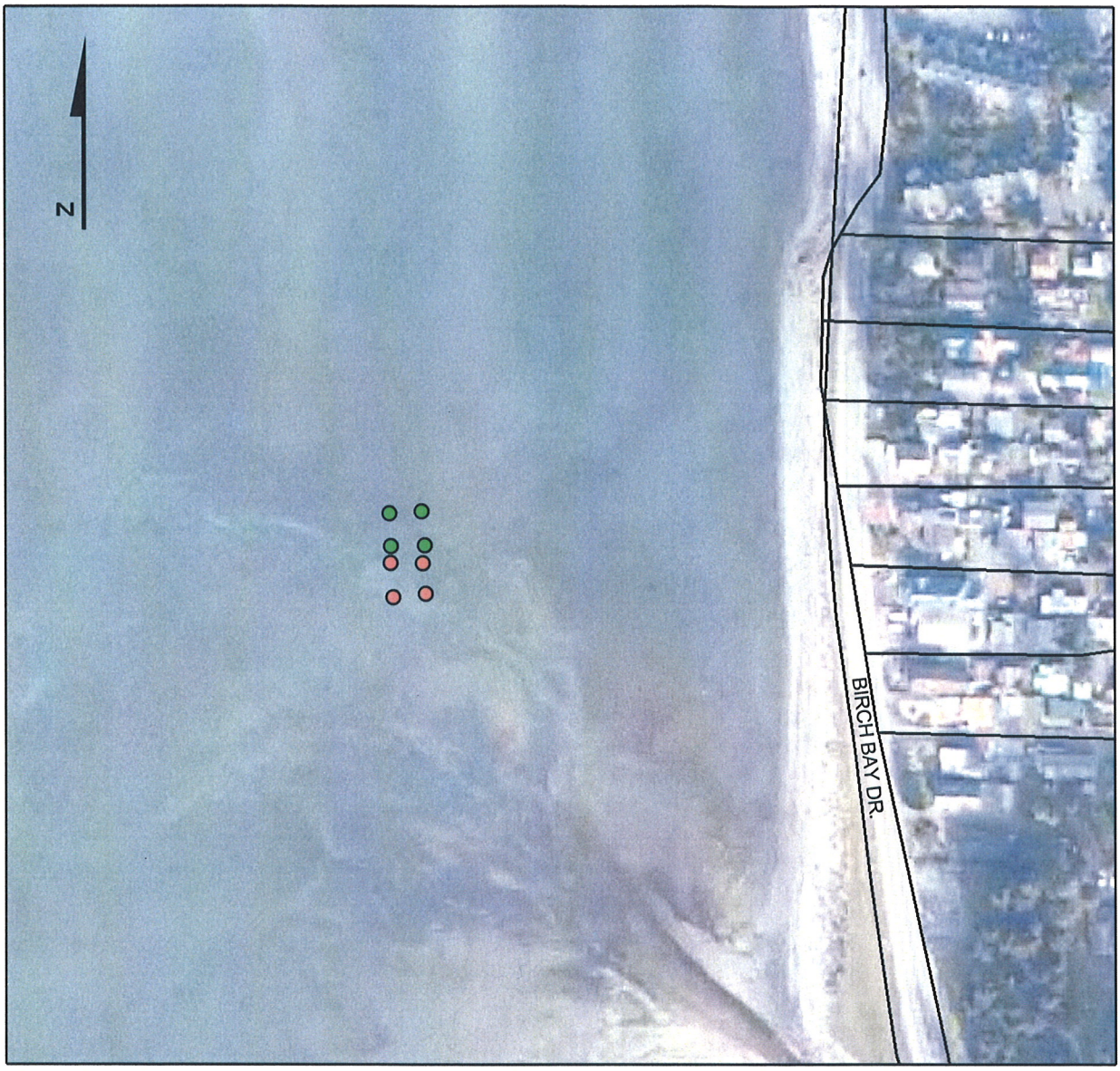
Legend

- roads
- Cottonwood Test Plot
- Cottonwood Control Plot

0 50 100 200 300 400 Feet

WHATCOM COUNTY WASHINGTON

MRC Clam Seeding Pilot Project
Terrell Creek Test and Control Plots



Legend

- roads
- Terrell Test Plot
- Terrell Control Plot

0 62.5 125 250 375 500 Feet

List of Volunteers

September 8, 2007 – Post-Seeding Survey 1

Gerald Larson	MRC
Bob Cecile	MRC
Andrea Olah	MRC
Neil Borman	Volunteer/Skagit MRC
Cathy Borman	Volunteer/Skagit MRC
Erin Macri	Citizen Volunteer
Mike Thimgan	Citizen Volunteer
Steve Bailey	Citizen Volunteer
Nancy Kaye	Citizen Volunteer
Erin Fortenberry	Citizen Volunteer
Ann Swanson	Citizen Volunteer
Gene Hoerauf	Citizen Volunteer
Jim Calhoon	Citizen Volunteer

June 7, 2008 – Post-Seeding Survey 2

Gerald Larson	MRC
Bob Cecile	MRC
Andrea Olah	MRC
Stephanie Williams	Citizen Volunteer
Lynne Pendleton	Citizen Volunteer
Lindsay Taylor	Citizen Volunteer
Catherine Stelting	Citizen Volunteer
Marc Stelting	Citizen Volunteer
John Stockman	Citizen Volunteer
Colleen Burrows	Citizen Volunteer
Ann Swanson	Citizen Volunteer
Laurie Jewett	Citizen Volunteer
Dawn McKenney	Citizen Volunteer
Erin Fortenberry	Citizen Volunteer
Kim Cederstrom	Citizen Volunteer
Ruth Higgins	Citizen Volunteer
Naomi Murphy	Citizen Volunteer
Alexandra Johnson	Citizen Volunteer

Survey Field Sheet – MRC Clam Seeding Pilot Project

Date: _____ Surveyor Name: _____ Location *(circle one)* Cottonwood Beach Terrell Creek

Start Time: _____ Sampler Name: _____ Plot Type *(circle one)* Test Control

Stop Time: _____ Assistant Name: _____ Tide Time/Height: _____

Comments: _____

_____

_____

Transect No.: ☐ Random No. (if T1): ☐ Transect GPS: ☐

	SAMPLE HOLE 1 (random no.:_)				SAMPLE HOLE 2				SAMPLE HOLE 3				SAMPLE HOLE 4			
GPS:																
Sub[1]	M / S / G / C / other:				M / S / G / C / other:				M / S / G / C / other:				M / S / G / C / other:			
Veg[2]	P / A				P / A				P / A				P / A			
Water[3]	Y / N				Y / N				Y / N				Y / N			
Size [4]	*<0.5*	*0.5-1.0*	*1.0-1.5*	*>1.5*	*<0.5*	*0.5-1.0*	*1.0-1.5*	*>1.5*	*<0.5*	*0.5-1.0*	*1.0-1.5*	*>1.5*	*<0.5*	*0.5-1.0*	*1.0-1.5*	*>1.5*
Varnish																
Manila																
Native Littleneck																
Macoma[5]																
Cockle																
Eastern Softshell																
Other:																
Comments																

[1]Substrate codes - M=mud, S=sand, G=gravel, C=cobble, may also use combination of substrate codes with dominate substrate listed first (e.g. SG= sand/gravel)

[2]Vegetation - P = present; A = absent

[3]Water level deeper than 1 inch? Y = yes; N = no

[4]For all clam species, indicate the number of clams per size class (inches).

[5]Macoma clams include bentnose and other "bay" clams

Clam Survey Field Sheet Instructions

Prior to the survey, Whatcom County staff will locate the control and test plots and install tall wooden stakes at the corners.

Step 1 - Fill in the date and time, names of survey team members, plot type and location, tidal conditions, and transect number and random number, if Transect 1, in the spaces provided at the top of the form.

Step 2 - Record data in the table. Sample holes are by column, sample hole information is by row. Fill in random number for Sample Hole 1. Whatcom County staff will record GPS coordinates for transects and sample holes.

Step 3 - The team will measure the number of feet (random number) to establish Transect 1 and Sample Hole 1. The remaining transects and samples holes will be 10 feet apart and located in numerical order. The surveyor will mark the transect ends with small wooden stakes and the sample holes with survey flags.

Step 4 - The sampler will place the sample hoop over the survey flag. Before digging the sample hole, the team will describe the substrate, vegetation and water within the sampling hoop. The substrate, vegetation, and water codes are listed at the bottom of the table.

- The code for the substrate will be circled in the "Sub" column. Substrate combinations will be entered in the space after "other".
- The code for the vegetation will be circled in the "Veg" column.
- The code for water will be circled in the "Water" column.

Step 5 - The surveyor will dig the sample hole using the hoop as a guide and place the substrate on the tarp.

Step 6 - The sampler will sort the clams by type (varnish, manila, native littleneck, macoma, cockle, eastern softshell). For each type, the clams will be sorted by the four size categories: # less than 0.5, # between 0.5 and 1.0. # between 1.0 and 1.5, and # greater than 1.5. The surveyor will record the number of clams in each size category in the appropriate cell. If other clam species are found, record in the "other" row.

Step 7 - Note any other characteristics of interest for the sampling hole under "Comments".

Step 8 - Replace the substrate and clams in the hole.

Step 9 - Move to next sample hole and repeat Steps 4-8. After sampling the last hole along a transect, record the survey completion time.

Data recorded based on $1ft^3$ samples. After random start, transects and sample points at 10 foot intervals.

WHATCOM COUNTY
PLANNING & DEVELOPMENT SERVICES
5280 Northwest Drive, Suite B
Bellingham, WA 98226

HAL H. HART, AICP
Director

ROBERT C. MARTIN, AICP
Land Use Division Manager

EXEMPTION FROM THE SHORELINE MANAGEMENT PROGRAM SUBSTANTIAL DEVELOPMENT PERMIT REQUIREMENT

SHX2007-00004

Applicant: Whatcom County Public Works – Stormwater Division
Attn: Ms. Atina Casas
2011 Young Street, Suite 201
Bellingham, Washington 98225-4052

Project Description: Hand broadcasting of Manila clam seed on tidelands of Birch Bay as part of the Whatcom County Marine Resources Committee (MRC) clam enhancement program. No temporary or permanent structures will be utilized as part of this project. Each seeding plot will be approximately 100-square meters in size. Clam seed will be hand broadcast on an incoming tide at a density of 300 to 400 clams per square meter. The test plots will be divided into subplots during seeding to ensure consistent seed distribution and coverage. Seeding will be limited to the +3 to +1 feet mean lower low water level, which is the preferred tidal elevation for Manila clams. The project also includes a three-year monitoring program consisting of randomly selecting an appropriate number of sample sites from a one-foot grid system overlain on each plot. The number of samples will be based on a statistical sampling design, but ultimately determined by volunteer availability and capability. At each sample grid, field crews will dig down about six-inches, screen out the sediment, and identify and count all clams collected. Collected organisms will be returned to the substrate. Manila clam counts in the test and control plots will be compared to evaluate the success of the enhancement effort.

Project Location: Cottonwood Beach tidelands located in Section 24, Township 40 North, Range 01 West (APN: 405124037040)

Public tidelands north of Terrell Creek located in Section 30, Township 40 North, Range 01 East (APN: 400130062068)

Water Body: Birch Bay

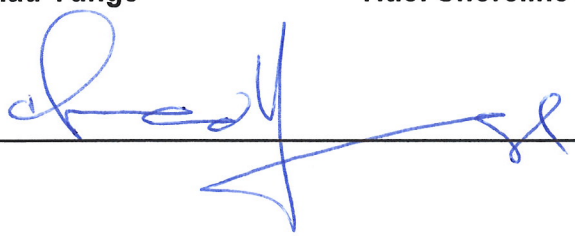
Shoreline Designation: **Aquatic**

Pursuant to the Whatcom County Shoreline Management Program, Title 23, Section 23.50.32(a), any development of which the total cost or fair market value, whichever is higher, is exempt from the requirement to obtain a substantial development permit, if such development does not materially interfere with the normal public use of the water or shorelines of the state. The proposed project is consistent with the policies of the Washington State Shoreline Management

Act and the Whatcom County Shoreline Management Program. **This Statement of Exemption is subject to the 7 conditions attached to this notice.**

This exemption does not release the applicant from the requirements of any other federal, state or local law or regulations and does not authorize work on property that the applicant does not own unless explicit written permission from the property owner is provided to Whatcom County. This exemption expires two years from the date of this notice if the project has not commenced by that time.

Official: Chad Yunge **Title: Shoreline Program Administrator**

Signature  Dated: 12 January 2007

CONDITIONS ASSOCIATED WITH SHX2006-00004

1. *The applicant shall contact the Washington State Department of Fish and Wildlife (WDFW) to obtain a Hydraulic Project Approval (HPA) or any other applicable permits as determined by WDFW. Written approval from WDFW is required prior to the placing of any aquatic organism in any area within the waters of Whatcom County regardless of whether it is a native or resident organism within the County and regardless of whether it is being transferred from within or outside the waters of Whatcom County. A copy of the WDFW approval shall be provided to Shoreline Administrator prior to commencement of the project.*

2. *Construction shall conform to the site plan, design, configuration, size and location that has been approved for this Statement of Exemption except as modified by this approval. Any alteration of the approved project shall require additional review by the Whatcom County Shorelines Administrator.*

3. *The proposed development shall be initiated and maintained so that it does not damage shore resources, other properties or otherwise create a public nuisance.*

4. *The project shall comply with all applicable federal, state and local laws and regulations.*

5. *The project shall adhere to Washington State Department of Ecology (DOE) water quality and all other applicable water quality standards. Quality of ground and surface waters shall not be significantly degraded.*

6. *Aquaculture activities shall be restricted to reasonable hours and/or days of operation when necessary to minimize significant adverse impacts from noise, light, and glare on nearby residents.*

7. *If archaeological materials (bone, shell midden, cobble tools, etc.) are observed during site work, work in the area of discovery shall cease and the Whatcom County SEPA Administrator (676-6907) LNTHPO (384-2298) and Washington State Office of Archaeology and Historic Preservation (360-586-3065) shall be contacted immediately to determine the significance of the discovery. If human remains are observed, the Whatcom County Sheriff (911) and LHTHPO Department (384-2298) shall be contacted immediately. Compliance with all other applicable laws pertaining to archaeological resources is required.*

Washington Department of FISH and WILDLIFE

WASHINGTON STATE SCIENTIFIC COLLECTION PERMIT

Washington Department of Fish and Wildlife, Attn: SCP
600 Capitol Way North
Olympia, WA 98501
(360) 902-2464

RCW 77-32-240, WAC 220-20-045.
Permit holder is authorized to collect fish, shellfish, wildlife, or the nests of birds, as provided herein and under the Permit Conditions for:

Display

Research:

- ☐ Electrofishing
- ☐ Education
- ☒ Scientific Investigation

Starting Date: **September 1, 2007** Expiration Date: **August 31, 2008**

Permit Holder: Erika K. Stroebel **Agency: Whatcom County Public Works** **Address: 2011 Young St, Ste 201** **Bellingham, WA 98225**		**Date of Birth:** NA
Telephone: 360 715-7450	**Fax:**	**Email: estroebe@co.whatcom.wa.us**

Sub-Permit Holder(s): **Atina Casas** **Stephanie Williams** **Gerald Larson** **Bob Cecile** **Andrea Olah**	

Species: **Clams: cockles, horseneck, macoma, varnish, butter, Manila, Pacific littleneck, eastern softshell.**	**Number:** **NONE RETAINED**	**Location and Method of Collection:** **Birch Bay, Drayton Harbor, Semihmoo, Chuckanut Bay/Mud Bay by hand.**

GENERAL PERMIT CONDITIONS:

1. A Scientific Collection Permit is non-transferable.
2. A copy of this permit must be in the possession of any person exercising the privileges authorized by this permit.
3. The Permit Holder is responsible for ensuring that all Sub-Permit Holders are qualified and experienced to conduct the specified

activities and comply with all conditions of this permit. Only those Sub-Permit Holder(s) listed on the permit are authorized to engage in permitted activities.

Please note that compliance with Scientific Collection Permit requirements and permit conditions does not ensure compliance with federal, local, or other state laws. Collection of state or federal endangered or threatened species, state sensitive species, or state or federal candidate species is prohibited unless specifically authorized in this permit. Collection of game birds or game animals is prohibited unless specifically authorized in this permit. Collection of migratory birds, marine mammals, and any species listed under the federal Endangered Species Act may require a federal permit before collecting.

For any collection/research activity of marine mammals and/or federally-protected anadromous and marine fish species, etc., contact NOAA-National Marine Fisheries Service at http://www.nmfs.noaa.gov/endangered.htm or 503-230-5400. For any collection/research activity of migratory birds, resident fish species (bull trout) and/or federally-protected wildlife, contact U.S. Fish and Wildlife Service at http://endangered.fws.gov or 360-753-9440.

5. This permit does not authorize collection from non-WDFW protected lands or waters (may include but not exclusive to: parks, reserves, refuges, natural areas, conservation areas, tribal lands, monuments, etc.). This permit does not authorize trespassing on private or restricted public lands. Additional permits issued by landowners/managers may be required.

6. No collection shall occur in WDFW conservation and wildlife areas or marine preserves, unless otherwise specified in this permit.

7. Specimens acquired under this permit remain the property of the state and will not be offered for sale or sold orused for commercial purposes or human consumption. Exchange or transfer of specimens, unless otherwise specified in this permit, requires prior written approval from the Director of WDFW.

8. Employees of WDFW have the right to inspect the collection activities authorized by this permit.

9. Vessels engaged in collection activities shall display a sign "RESEARCH," readable at 100 feet to unaided vision.

10. Permit Holders using unattended equipment must have attached to that equipment, a tag clearly markedwith the permit number and name and current address of the Permit Holder. The address used may be that of the organization the Permit Holder represents, e.g., university, company, or corporation.

11. Permit Holders are prohibited from using anesthetics at times and in places where fish may be subject to "catch and keep" fisheries within 21 days. Irritants or poisons are prohibited at all times.

12. Unless otherwise specified in this permit, release of specimens is allowed only at the exact capture site immediately after capture. Release of fish and marine and freshwater invertebrates at any other site or time requires a transport, release, or planting permit. The conditions of this permit may specify that no release of certain specimens is allowed. Contact WDFW Fish Program (360-902-2700) or Wildlife Program (360-902-2515) for further information.

13. **Reporting Requirements:**
Reports must be submitted to WDFW upon completion of the display or research project, and must be received no later than 60 days after the expiration of the permit. All reports submitted to WDFW shall include Permit Holder's name and permit number.

- ☐ For **anadromous fish and freshwater collections**, the report shall include the 1) Date of collection; 2) Species name (for invertebrates, to the lowest taxonomic level possible); 3) Numbers of each species encountered and/or retained; 4) Location of each sample site, including county, water body, and latitude/longitude or GPS coordinates; 5) Disposition of specimens. This information is to be recorded at each capture site and includes ALL species encountered (or impacted by the collection activity) even if not retained or meant for the study.

- ☐ For **marine collections**, the report shall include the 1) Date of collection; 2) Species name (to the lowest taxonomic level possible); 3) Numbers of each species encountered and/or retained; 4) Location of each sample site, including county, water body, and latitude/longitude or GPS coordinates; 5) Disposition of specimens. This information is to be recordedat each capture site and includes ALL classified and unclassified species encountered (or impacted by the collection activity) even if not retained or meant for the study. IN ADDITION, for:
  - **Rock scallops** (*Crassodoma gigantea*) include: specific location, mortality of any rock scallop during collection, exact position and depth of specimens collected, and shell length measured from edge to edge at the widest part of the shell.
  - **Octopus** (*Enteroctopus dofleini*) include: specific location, individual weight, depth, and sex of octopus taken.
  - **Geoduck** (*Panopea abrupta*) include: specific location, gear used, depth, and individual weight of geoducks taken.

☐ For **wildlife collections**, the report shall include the 1) Date of collection; 2) Species name (common and scientific) with number collected, number released, and disposition of retained individuals; 3) Location of collection, with one or more of the following: legal description (Township, Range, Section, and 1/4 and 1/16 Section), map with location indicated, UTM coordinates, or latitude/longitude coordinates.

SPECIAL PERMIT CONDITIONS:

Approval with the following conditions:

SCP shall not be valid for the take of ESA-listed species unless permit holder has obtained all necessary federal ESA take authorization(s).

An annual report is required, indicating the numbers of each targeted and non-targeted species collected, the location of their capture, the method of capture, the date of capture, and the disposition of these specimens. This information is to be recorded at the capture site, and the report shall be submitted to WDFW within 60 days of project completion.

Any sampling or collection in the marine waters of San Juan County or Cypress Island (Skagit County) must also be authorized by the director of the Friday Harbor Laboratories (FHL). The director of FHL has the authority under RCW 28B.20.320 to restrict or deny collections in these areas.

No work or collection is authorized in Hood Canal south of the Hood canal bridge due to low dissolved oxygen concerns. If work must be conducted in Hood Canal, special authorization must be obtained from WDFW Fish Program. The special application for Hood Canal must include justification that a sample must be taken in Hood Canal, not simply because Hood Canal is convenient. WDFW has closed other harvest due to the stress that fish and shellfish are under from the low dissolved oxygen. There is a similar prohibition on scientific collection unless there are special needs and anticipated results of particular value from the work.

No work or collection is authorized in marine preserves or conservation areas.

There are six new marine preserves in Seattle, parts of the six parks owned by Seattle: Golden Gardens, Richey Viewpoint (just south of Alki), Lincoln Beach, Carkeek, Emma Schmitts, and Discovery. About half of each of those beaches were closed as of May 1, 2005.

Biologist note: For best survival, the samplers should do their best to re-bury the clams with their siphons to the surface.

This permit is not valid until signed by the permit holder, and a copy placed in the United States mail, postage affixed, and addressed to the Department at:

Washington Department of Fish and Wildlife, Attn: SCP
600 Capitol Way N.
Olympia, WA 98501-1091

The undersigned agrees to comply with the general and special conditions of this Scientific Collection Permit, and agrees to file a final report within 60 days of the expiration date of the permit.

Erika Strobel — Signature of Permit Holder

8/8/07 — Date

Signature of WDFW Representative

8-1-07 — Date

THIS PERMIT MAY BE REVOKED OR MODIFIED AT THE DISCRETION OF THE DIRECTOR OR THE DIRECTOR'S DESIGNEE.