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PROJECT TITLE: Northwest Straits Project: Jefferson County Marine Resources Committee (Operations and Projects)

DELIVERABLES FOR TASK NO: Task 5 – Olympia Oysters.

Deliverable 5.3: Olympia oyster survey data and summary report for Quilcene Bay

PROGRESS REPORT: []

FINAL REPORT []

PERIOD COVERED: Oct 1, 2016– Sept 30, 2017

DATE SUBMITTED: Oct 20, 2017



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Olympia Oyster Survey Data & Summary Report For Quilcene Bay

Olympia Oyster Task 5.3

Data compiled by Jackie Gardner. Report by Cheryl Lowe.

Overview & Summary

Quilcene Bay is the Jefferson MRC's other Olympia Oyster project. Our goal is to re-establish a healthy population of Olympia oysters in Quilcene Bay. Currently, scattered Olympias are present, but there are no dense beds of Olympia there. We began by testing survival of seeded Olympia oysters cultch in small plots. The test plots are on WDFW tidelands adjacent to commercial clam beds on the southwest side of Quilcene Bay. Access is from the WDFW Linger Longer Rd tidelands access route. The project is a collaboration with WDFW, Tribal Co-Managers (shellfish biologists from Jamestown S'Klallam and Skokomish Tribes) and the MRC. The project is similar in scope to other WDFW experimental test plots, so WDFW recommended we proceed under those guidelines, rather than seeking federal and state agency permits for experimental plots. The MRC serves as team facilitator, coordinating volunteers, and obtaining donated and purchased seeded cultch. We found some oyster drills present in the project vicinity in 2015 and 2016, but our 2017 results indicate that Olympia oysters should do well at this site. In addition to our work, Puget Sound Restoration Fund (PSRF) also has an Olympia oyster site on the east side of Quilcene Bay.

In October 2015, we had placed an order for 50 bags of hatchery-seeded cultch from PSRF, which were delivered in June 2016 (along with 28 other bags of seeded cultch with fewer spat/shell than the 50 "high quality" cultch bags.) These 78 bags were all hardened off and over-wintered at the Taylor Shellfish Hatchery in Quilcene Bay until May 2017 to increase likelihood of survival of the oysters.

On May 24, 2016, we collected baseline data on a sample number of shells from 11 bags of overwintered, wild-seeded cultch (donated by Taylor Shellfish) and then spread the cultch in five plots.

On May 25, 2017 nine volunteers, MRC staff, and WDFW staff monitored the wild-seeded cultch that had been spread the previous year. Each plot had only 2 bags of cultch spread in a 10 ft diameter circle in 2016, and over the year, tidal flow dispersed the shell unevenly to a larger area. In an effort to capture more data, our transects ran as 16 ft radius from the centerpoint of the plot. We then measured spat from a sample of the 78 bags of hatchery-grown seeded cultch, then spread them in the same test plot areas. Data summary is included below.

Shell stacks were placed on May 26, 2017 and collected in late August 2017. Data is now being compiled (October 2017).

Data and Observations

Summary tables are shown below. Raw data sheets, summary tables, and Monitoring Protocols are also attached at the end of this Report.

2017 Plot Data

All five plots had about the same number of quadrats and similar average spat sizes. Total number of spat/plot and total number of Pacific oyster shell/plot were highly variable, which may reflect which plots had stronger tidal flow across them, moving the shell out of the plot.

Summary of 2017 PLOT DATA for Quilcene Bay						
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	TOTALS
Total # spat counted	67	1	3	41	111.2	223.2
Total Quadt w measured Spat	9	1	2	6	14	32
Total all Quadt in plot	16	18	16	18	14	82
Total Shells w measured Spat	35	1	2	11	33	82
Total mm measured	1181	12	47	674	1660.2	3574.2
Average size spat	17.6	12.0	15.7	16.4	14.9	16.01

2017 Seeded Cultch Data (Overwintered and Spread out in May 2017)

100 Olympia oyster spat were sampled and measured from the bags in each plot before they were spread out in the plot. WDFW Shellfish Manager Chris Eardley believes that these Olympia oysters are now big enough and have thick enough shells to discourage/deter predatory marine snails, and survival rates will be much higher than if we had not overwintered them in the bags. Table below shows averages for each plot. A half-dozen spat measured 35 mm.

SUMMARY of Spat # and Size from 2017 Cultch						
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	3 sm bags
Avg # spat/shell	5.22	4.9	3.98	6.04	4.58	9.1
Avg Spat Size/Plot	20.24	19.74	17.86	19.52	20.13	21.37
100 Olys measured & counted for each plot.						
3 small bags of shell counted separately, then dispersed into plots						

Amy Does, the volunteer processing the six PSRF shell strings for Discovery Bay has not yet completed her work. Original data sheets are stored at the MRC office and a copy is sent to PSRF. No comparisons are provided here. Jackie Gardner compiled the Quilcene Bay data collected by the MRC monitoring team.

Quilcene Bay Recommendations for 2018

- Continue monitoring using the same protocols.

- In 2018, it would be useful to measure the approximate total area where the cultch is now distributed. It could be a challenge, however, to determine the boundaries of the area.
- Add more seeded cultch. Jefferson MRC plans to add more PSRF hatchery-seeded cultch, which will be grown in winter-spring 2017, and overwintered until spring 2018.

Outreach & Photos

The Jefferson MRC did not conduct outreach activities related to this project, except for recruiting volunteers for monitoring through local list-serves, and posting a brief report on our website. The Peninsula Daily News picked up on the Jefferson MRC's call for volunteers, however, and helped publicize this project. See attached article below.

Below: Jefferson MRC website notice in June 2017, followed by copy of PDN article:

jeffersonmrc.org

Google Calendar - Month of Aug 2017 Tibbal_East Marrowstone Park_061520... (13) Washington Department of Fish... Jefferson County Marine Resource C...

More Olympia Oysters in Quilcene

In late May, MRC volunteers planted more Olympia oysters in Quilcene Bay as part of an on-going effort to rebuild that historic population. Over two days the volunteers counted, measured and celebrated as they spread 80 bags of seeded Olympia oyster cultch on test plots. This project is part of a collaboration with WA Dept of Fish and Wildlife and two local Tribes. Our goal is a substantial, healthy, self-sustaining Olympia oyster bed habitat that provides benefits to many other marine species.

 **Jefferson County Marine Resources Committee**
 c/o Jefferson WSU Extension
 380 Jefferson St
 Port Townsend, WA 98368

Contact: [Cheryl Lowe](#)

 **Northwest Straits INITIATIVE**

 **PUGET SOUND PARTNERSHIP**



volunteers put out 108 traps multiple times last week.
 "We've got out what we can handle," he said.

Sollmann said crews have a good system down of cutting bait, checking traps and recording where green crabs are found.

April 13, which is the first signing of the crustacean along the North Olympic Peninsula.
 TURN TO CRAE/A7

vey toward residents of Brinnon and Quilcene, she said.
 "The survey is an additional form of public input," Herschelmann said.
 TURN TO INPUT/A6

Volunteers are sought for Olympia oyster monitoring

Work part of nearshore restoration

By CYDNEY MCFARLAND
 PENINSULA DAILY NEWS

QUILCENE — The Jefferson County Marine Resources Committee is seeking volunteers to monitor Olympia oyster populations as part of a nearshore restoration project.

The committee is in need of volunteers Friday to collect data on test plots set out last year and to collect baseline data on this year's seed clutch in the state Department of Fish and Wildlife tidelands in Quilcene Bay, said Cheryl Lowe, marine resources committee (MRC) member, in a news release.

This is part of an almost 10-year project to restore Olympia oyster populations in Quilcene and Discovery bays. According to Lowe, Olympia oysters used to be a native population in both bays, but in Discovery Bay, the population has dwindled considerably and in Quilcene Bay, they no longer exist. "Since Discovery Bay does have a small population, we've been trying to restore habitat," Lowe said.



JEFFERSON COUNTY MARINE RESOURCES COMMITTEE
 From left, Jackie Gardner, Amy Does, Brady Blake, Sarah Fleken and John Adams monitor the Jefferson County Marine Resources Committee's Olympia oyster restoration project at Quilcene Bay.

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INSIDE TODAY'S PENINSULA DAILY NEWS
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09933 11111

Photos:

Monitoring Quilcene Bay Plots in May 2017



Current condition of wild-seeded cultch from May 2016 deployment:



Seeded cultch from overwintered bags deployed in May 2017



2017 Protocols for Seeded Cultch Baseline & Field Notes

Quilcene Bay Olympia Oyster May 26, 2017 Seeded Cultch Deployment (78 bags)

Time and Location of deployment:

*Started at 10 am at WDFW Indian George Creek beach access on Linger Longer Rd.
Low tide is predicted to be -3.4 at 11:56 am. Note: At 12:30 pm, tide was just coming
into site.*

Finished back at parking lot at 1:15 pm. Add travel time for volunteer hours.

Shell stack locations: *Placed ROUGHLY halfway between plot centers 1 & 2 and
another set roughly half way between plots 3 & 4.*

*Based on Google Map and estimating location adjacent to a known plot centers)--
N49.807980, 122.862164 (shellstacks # 4-6) and N47.80663, W122.863051
Shellstacks have QB on label.*

Volunteers: Jackie Gardner, Neil Harrington, Wade Crouch, Sarah Fisken, Mary
Williams, Cheryl Lowe

Equipment:

- Volunteer sign-in (NWSF)
- Gloves (to protect from sharp shell edges)
- Mudboots
- Plot stakes were located already (or bring 5 stakes (15" stakes with orange painted tops)/ Lat-long GPS data of test plot centers/hammer
- Tape measure (1) -only used to measure final diameter of plots once shell was distributed
- mm rulers (4)
- camera
- GPS (optional if centers already located)
- (4) 5-gal buckets
- 2 sets of data sheets on waterproof paper (8 copies of blank for each type of data sheet)
- clip-boards
- pencils
- Rite in the Rain Notebook (optional)
- Cookies
- Discover Pass
- First Aid Kit
- (3) or 6 shell-stacks from PSRF
- 2-3 knives or sharp blades to cut bags open
- Print map of site with reference points (property corners marked with tall white pvc pipe) *and maybe photos of previous deployment for reference*

Overview

We will take baseline info for number and size of overwintered seeded cultch (PSRF) for each test plot then spread out the cultch in the plots. *(Bags from PSRF were kept at Quilcene Taylor Shellfish hatchery from June 2016-May 2017.*

78 bags were placed the day before near the plots (50 “good” seed set from PSRF and 28 “poor” set). 16 bags (two plots had only 15 bags) were carried to each plot (near each plot’s center stake), with random selection of bags (to ensure random distribution of “good” and “poor” seeded cultch).

1. Cut open one bag. Grab several oyster shells from various locations in the bag (outside edge, inside, left, right and center) and place them in a 5-gallon bucket. Mix them up a little.
2. Take out 10 shells and count all the Olympia oysters on each shell on both sides. Record numbers on SPAT COUNT data sheet. Set aside.
3. Then measure the first 20 Olympia oysters on randomly selected shells from the bucket (including some of the ones you just counted) and record height on SPAT SIZES data sheet. *(We had two recorders and 3 people counting #/shell or measuring Olys and calling them out the recorders. There were separate tally sheets for each plot, but we did not separate out sampled bags within a plot.)*
4. Repeat for 4 more bags (5 bags = 30-33% of bags for that plot).
5. Spread all the shells at that plot in a dense distribution, starting at the center and keeping the distribution in a rough circle shape *(average radius is 14 ft when we finished, but tides will move them around).*
6. Repeat at the other 4 plots.
7. We did not count the number of shells/bag, but assume an average number is 250-300 shells/bag.

NOTES on TEAM ASSIGNMENTS: Once bags are moved to the site, one person cut open 5 randomly selected bags. One team member put the sub-samples in a new bucket just before the counting team arrived at that bag. This way, bag averages can be teased out of the data (every 10 shells sampled, or one column of 20 ht measurements) Also we waited and spread the shell at the end of the day, so we knew we had finished the data collection first. A team of two can count and record the number of spat. A second team of two (or 3) can measure and record size of spat from the same batch.

Agenda for the day.

1. Volunteer sign-in at parking lot.
2. Safety review and goals for the day.
3. *Mark the test plots with stakes: First, look for stakes installed last year. Put a new stake in that location if found or put a new stake in approximate location. If you can't find the stakes, use the GPS and lat/long data from last year to find approximate location and install a new stake. In 2017, Chris used the same lat/long to locate the centers, as only 2 stakes were actually found.*
4. Take new GPS coordinates for all 5 stakes.

5. Record new GPS lat-long data and time on data sheets.
6. Place 16 bags near the center of each of the test plots, next to the stakes.
7. See instructions above for monitoring protocols.
8. Install the 3 PSRF shell-strings in the immediate vicinity of the test plots (*In May 2017, one set was placed between plots 1 & 2 and another set between plots 3 & 4.*)
9. RECORD GPS locations for the shell-stacks in the notebook or data sheet—*No GPS available on May 26, 2017, so we estimated location based on GPS of plot centers: See above for final lat/long.*

NOTES:

WDFW standard protocols use mm for biological measurements, but measure tideland lengths in feet, so we used the same standards.

2016: 5 ft radius = 7.3 sq meters (= 78.5 sq ft)

2017: 7 ft radius (new distribution) = 154 sq ft

2017—we were out the day before taking transect measurements and installed a temporary buoy tied to a stake near where the next day's shell should be dropped. We used Chris Eardley's accurate GPS the previous day to re-locate the plot center points, and marked them with a stake. The buoy seemed to work well for getting the new bags in the right place, so the boat delivery did not need GPS coordinates.

UPDATED GPS locations for Test Plots

Test Plot #1

N47.80806, W122.86204

Test Plot #2

N47.80796, W122.86237

Test Plot #3

N47.80784, W122.86278

Test Plot #4

N47.80767, W122.86319

Test Plot #5

N47.80779, W122.86340

Shell Stack Locations

QB1: N47.80769, W122.86311

QB2: N47.80777, W122.86323

QB3: N47.80774, W122.86317

Olympia Oyster PLOTS Monitoring--Quilcene Bay 2017
Jefferson County Marine Resources Committee
May 25, 2017

Protocols drafted by Cheryl Lowe following phone conversations with Chris Eardley and Brady Blake.

2017 Participants: Brady Blake, Neil Harrington, Sarah Fisker, Lucas Hart, Pete Rhoads, Cheryl Lowe, Chris Eardley (met us at start--not much time in field) Frank Handler, Karen Childers. Gordon King delivered shell in PM for next day's activities.

Goal:

To monitor oyster spat survival of wild-seeded cultch placed in 5 test plots in May 2016 in Quilcene Bay. For more details about initial work, see Jefferson MRC's Olympia oyster project report and maps from 2016.

Equipment:

- GPS
- notebook for writing notes
- 100' tape measure
- camera (or two) for quadrat pix
- data sheets (on waterproof paper)
- pencils
- clipboards
- Stakes with painted tip or pink duct tape
- 20 wire flags to mark points and/or quadrat locations
- materials for temp buoy for boat delivery
- NWSF Volunteer sign-in forms
- Be sure to do safety talk and safe access route to project area
- Shell stacks (2 sets) labeled
- Discover Pass
- Buckets & gloves
- Snacks

Compass directions (from www.Randomnumbergenerator.com) to bisect the circle:
56, 98, 147, 179, 327

Protocols:

Overview: Random placement of quadrats along 4 radius transects, with (4) ½ meter quadrats per transect.

Summary: We used random numbers to generate a compass direction when standing at center of circular plot (clockwise from magnetic north). *Because tides*

moved the shell around after it was placed, we made the radius transects 16 ft long (original plots were about 5 ft radius.)

1. Install a new stake at the center of each test plot. Record GPS coordinates. Chris used a Trimble GPS unit to relocate centers, so no need to record new coordinates.
2. From the center point of the **first plot**, face **56° NE** and place a wire flag at 16' from center. Lay measuring tape to indicate transect. The first placement is determined by a random number between 0 and 4; place the first quadrat at that point. Then place the remaining 3 quadrat frames per transect 4 ft apart. (Example: If 2 is the random number, quadrats were placed at 2', 6', 10' and 14' along the transect.)
3. Then repeat at 90 degrees rotation from that first transect for another 3 transects to finish the plot.
4. For each quadrat, you will
 - a. Count the number of Oly spat on each shell in the quadrat.
 - b. Measure and record the size of each spat found on each shell piece
 - c. (More details in next section)
5. **Second Plot:** Face **98° SE** and repeat the process above.
6. **Third Plot:** Face **147° SE** and repeat the process above
7. **Fourth Plot:** Face **179° S** and repeat the process above
8. **Fifth Plot:** Face **30° NE** and repeat the process above

Notes: from 2017 Plot Monitoring

PLOTS: We started monitoring with #5 and ended with #1, where tide was coming in at 12:30 pm. Plot #2 didn't have much shell. It seemed to be at a slightly lower elevation, as it was in 1-2 inches of water the whole time we were out there (shallow tidal channel or basin?)

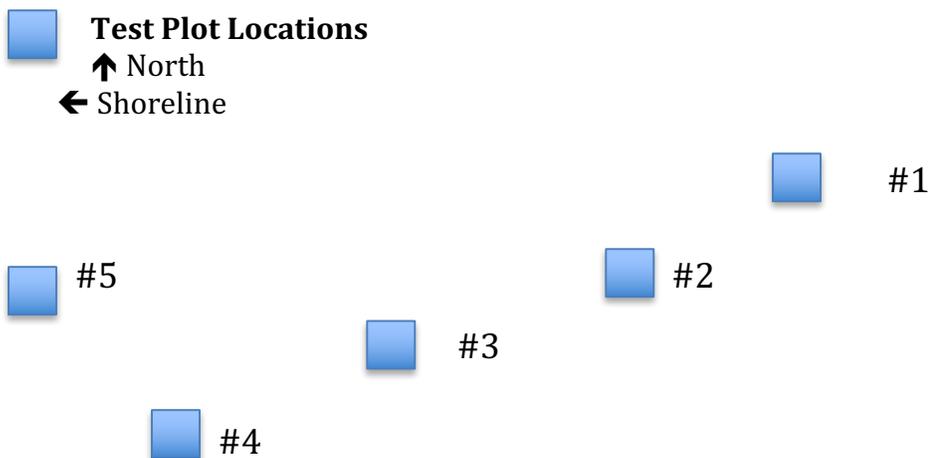
Data Sheets: Keep data for each quadrat separate, but no need to assign a number to the quadrat within each plot. With 2 teams working, each team leap-frogged to the next quadrat in the line. Also, when counting shell, include 2 sides where shell might be touching or under the quadrat frame, and don't include the other 2 sides where shell is touching.

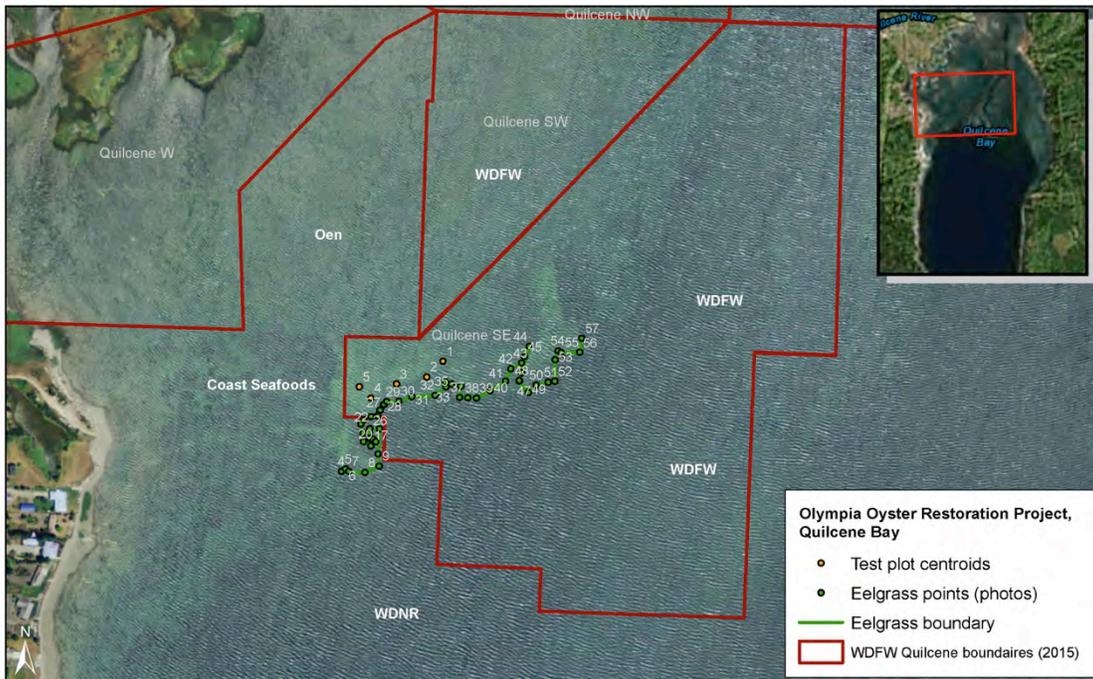
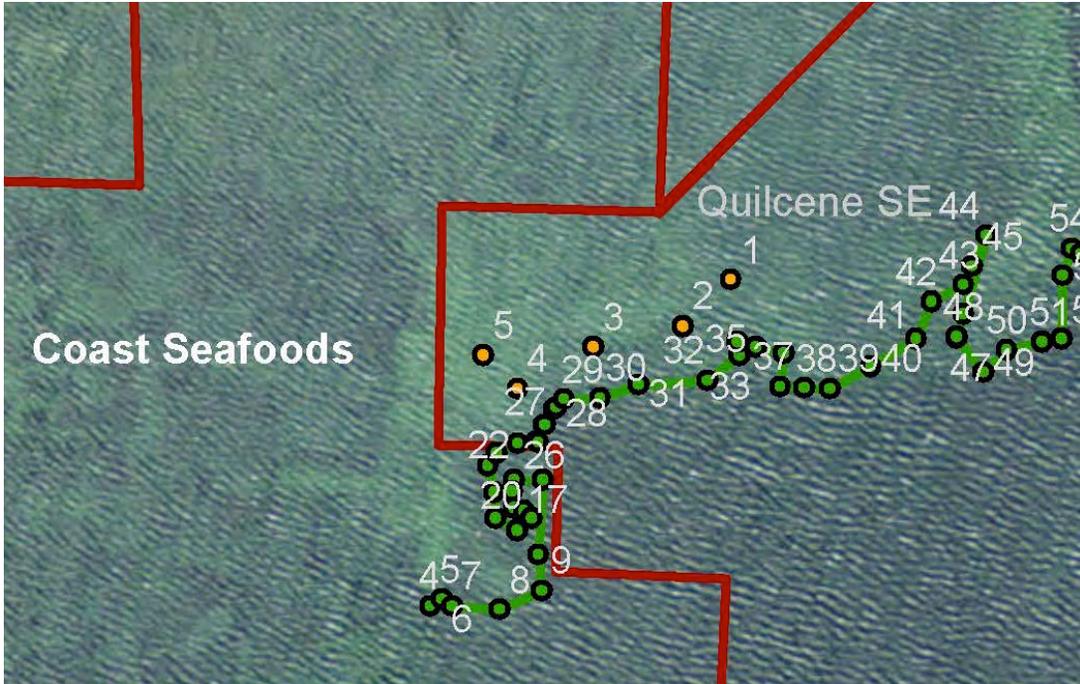
Specific Quadrat Instructions

1. Record on the data sheet the date, monitor team names, test plot #, lat/long for each plot, and start time for each test plot. Record quadrat numbers (you will have 16 quadrat data for each plot, or one less if the first random

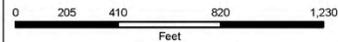
number is 3 or 4). (No photos taken, since we were not measuring area covered.)

2. Move all the shell out of one-quarter section and then start inspecting and moving them into that first quarter section as you collect data. Pick up each shell piece and inspect it for Olympia oyster spat. Using a new column on the data sheet for each shell, record sizes of all spat found on each shell. Once you have counted a shell, placed it on the ground in that first quarter section that was emptied.
3. If there are lots of shell or spat in the same quadrat, use the next section on the data sheet and note that it is a continuation of the same quadrat.
4. If there are no shells with Olys, then add a tally mark to “empty quadrats” cell.
5. Repeat for each quadrat in each plot.
6. Repeat for each test plot.





Corps Reference # NWS-
 Applicant: Jefferson County Marine Resources Committee
 Site address: n/a; tidelands in Quilcene, WA



Map creation: C. Eardley, Skokomish Tribe; 01/15/16

Parcel owner/ID:
 Washington Department of Fish and Wildlife
 WDNR Aq. Pr. # 1937029/BIDN 270940
 ("Quilcene Southeast")

Adjacent property owners: WDFW (N, S, E); Oen (NW);
 Coast Seafoods (W); WDNR (S)

See JARPA for full listing.

Proposed Project:
 Olympia oyster Habitat enhancement

Survey data: 07/31/15

Tidal datum: Feet MLLW, Scale: 1: 5000
 Coordinate datum: NAD 1983
 Aerials: ESRI/DeLorme

check ahead of time and make sure everyone is using the same form of decimal lat/long (decimal degrees or decimal minutes/seconds). John's GPS put him in a different place on the tideflats, but with the tides not yet fully out, Brady and Gordon were able to direct him into a closer location.

UPDATED GPS locations for Test Plots

Test Plot #1

N47.80806, W122.86204

Test Plot #2

N47.80796, W122.86237

Test Plot #3

N47.80784, W122.86278

Test Plot #4

N47.80767, W122.86319

Test Plot #5

N47.80779, W122.86340

Shell Stack Locations

QB1: N47.80769, W122.86311

QB2: N47.80777, W122.86323

QB3: N47.80774, W122.86317

Quilcene MRC Olympia Oyster Project
SIZE OF SPAT - 2017 Seeded Cultch.

Measuring Ht of 20 Olys on random shell from each bag

3-4 handfuls/bag mixed in bucket, then measure first 20 Olys found

Recorder's Names: <i>MARY WILLIAMS / Jackie</i>	Station Information
Deployment Date: <i>05-26-17</i>	Waterbody: Hood Canal
Monitoring Date:	Station Name: Quilcene
Time of Low tide:	Lat (WGS 84):
	Long (WGS 84):

TEST PLOT # *One*

Olys only	length - mm				
1	20	30	28	22	15
2	8	16	15	20	20
3	10	24	16	23	21
4	14	27	5	20	14
5	30	29	15	23	30
6	24	26	16	19	19
7	15	25	21	25	15
8	18	10	10	20	21
9	11	20	17	21	19
10	20	18	16	12	15
11	25	25	20	26	25
12	21	25	21	25	21
13	35	20	15	25	19
14	13	20	22	24	18
15	12	19	21	30	19
16	19	19	22	31	13
17	24	30	20	23	16
18	15	31	18	25	20
19	17	30	10	18	17
20	23	20	15	25	19

Quilcene MRC Olympia Oyster Project
SIZE OF SPAT - 2017 Seeded Cultch.

Plot 2

Measuring Ht of 20 Olys on random shell from each bag

3-4 handfuls/bag mixed in bucket, then measure first 20 Olys found

Recorder's Names: <i>Mary Williams</i>	Station Information
Deployment Date: <i>5/26-17</i>	Waterbody: Hood Canal
Monitoring Date:	Station Name: Quilcene
Time of Low tide: <i>noon</i>	Lat (WGS 84):
	Long (WGS 84):

TEST PLOT # 2

Olys only	length - mm				
1	30	29	30	20	10
2	10	26	25	11	22
3	15	9	9	16	13
4	12	26	21	21	15
5	27	20	20	20	22
6	20	21	22	27	24
7	22	21	20	16	19
8	26	22	17	20	24
9	27	21	24	20	22
10	25	35	26	28	20
11	23	15	20	27	14
12	30	25	11	25	18
13	24	28	17	4	15
14	25	24	25	17	17
15	21	8	16	17	15
16	20	10	18	7	23
17	16	16	22	6	18
18	25	20	20	15	18
19	15	20	21	20	18
20	17	14	10	28	25

Quilcene MRC Olympia Oyster Project
SIZE OF SPAT - 2017 Seeded Cultch.

Plot (3)

Measuring Ht of 20 Olys on random shell from each bag
 3-4 handfuls/bag mixed in bucket, then measure first 20 Olys found

Recorder's Names: JACKIE MARY WILLIAMS	Station Information
	Waterbody: Hood Canal
Deployment Date: 5-26-17	Station Name: Quilcene
Monitoring Date: MA	Lat (WGS 84):
Time of Low tide: Noon	Long (WGS 84):

TEST PLOT # 3

Olys only	length - mm				
1	22	30	15	16	20
2	11	21	20	25	15
3	15	27	15	15	24
4	10	18	22	17	20
5	20	24	30	12	20
6	20	25	10	9	10
7	26	20	30	16	11
8	20	27	22	7	15
9	20	22	15	15	13
10	11	25	20	20	7
11	6	26	20	18	10
12	20	21	20	15	23
13	10	20	12	25	20
14	20	15	22	25	20
15	22	23	10	20	15
16	22	29	20	15	5
17	20	10	18	10	8
18	10	18	18	18	10
19	15	24	19	12	25
20	24	20	12	11	15

Quilcene MRC Olympia Oyster Project
SIZE OF SPAT - 2017 Seeded Cultch.

Measuring Ht of 20 Olys on random shell from each bag

3-4 handfuls/bag mixed in bucket, then measure first 20 Olys found

Recorder's Names: <i>MARY WILLIAMS/Jackie</i>		Station Information	
Deployment Date: <i>05-26 17</i>		Waterbody: Hood Canal	
Monitoring Date:		Station Name: Quilcene	
Time of Low tide: <i>Noon</i>		Lat (WGS 84):	
		Long (WGS 84):	

TEST PLOT # 4

Olys only	length - mm				
1	29	16	20	28	16
2	14	21	25	26	15
3	15	12	13	24	15
4	21	20	10	20	22
5	20	20	20	17	15
6	25	12	22	27	19
7	20	14	17	14	20
8	6	26	18	26	17
9	15	25	15	25	22
10	25	13	19	27	16
11	17	30	18	24	19
12	17	15	12	21	22
13	15	20	19	29	14
14	12	19	17	9	25
15	20	24	27	23	19
16	18	25	25	22	17
17	15	28	28	19	16
18	20	17	12	25	30
19	17	25	17	21	10
20	30	12	20	20	17

Quilcene MRC Olympia Oyster Project
SIZE OF SPAT - 2017 Seeded Cultch.

Measuring Ht of 20 Olys on random shell from each bag

3-4 handfuls/bag mixed in bucket, then measure first 20 Olys found

Recorder's Names: <u>Mary Williams / Jackie</u>	Station Information
Deployment Date: <u>5-26-17</u>	Waterbody: Hood Canal
Monitoring Date:	Station Name: Quilcene
Time of Low tide: <u>Noon</u>	Lat (WGS 84):
	Long (WGS 84):

TEST PLOT # 5

Olys only	length - mm				
1	18	20	30	20	25
2	14	22	12	20	27
3	21	21	12	20	25
4	23	22	15	21	20
5	16	25	15	20	35
6	21	10	12	20	14
7	18	25	10	15	33
8	19	20	14	15	14
9	18	18	25	29	30
10	17	35	12	15	24
11	5	10	20	16	23
12	8	17	25	22	15
13	21	19	20	18	26
14	19	24	22	15	22
15	25	35	25	20	23
16	27	18	16	20	20
17	20	21	22	15	25
18	20	19	15	18	24
19	16	18	20	25	25
20	20	20	20	26	26

Quilcene MRC Olympia Oyster Project
SIZE OF SPAT - 2017 Seeded Cultch.

Measuring Ht of 20 Olys on random shell from each bag

3-4 handfuls/bag mixed in bucket, then measure first 20 Olys found

Recorder's Names: NARAY WILLIAMS / Soder	Station Information
Deployment Date: 05/26/17	Waterbody: Hood Canal
Monitoring Date:	Station Name: Quilcene
Time of Low tide: Noon	Lat (WGS 84):
	Long (WGS 84):

3 small bags

TEST PLOT # A

SMALL BAGS of oysters

3A 3B 3C

3A

3B

Olys only	length - mm				
1	19	29	19		
2	25	19	19		
3	20	14	24		
4	16	30	18		
5	20	20	20		
6	28	25	22		
7	22	28	23		
8	24	23	20		
9	15	22	17		
10	14	25	20		
11	16	30	14		
12	20	25	15		
13	10	22	20		
14	17	25	15		
15	27	15	18		
16	22	25	21		
17	20	29	30		
18	24	20	23		
19	22	26	33		
20	16	27	35		

Quilcene MRC Olympia Oyster Project
SPAT COUNT - 2017 Seeded Cultch.

Counting # of spat/shell for a random 10 shells/bag with 16 bags/plot

Recorder's Names: <i>Jochie, Neil, Arach</i>	Station Information
Deployment Date: <i>5/26/17</i>	Waterbody: Hood Canal
Monitoring Date:	Station Name: Quilcene
Time of Low tide: <i>noon</i>	Lat (WGS 84):
TEST PLOT # <u>1</u>	Long (WGS 84):

Shell Sample #	Front # Olympias	Back # Olympias	Shell Sample #	Front # Olympias	Back # Olympias
1	4		26	2	
2	8		27	0	
3	2		28	2	
4	12		29	0	
5	3		30	4	
6	9		31	17	
7	1		32	7	
8	0		33	9	
9	4		34	6	
10	17		35	14	
11	1		36	3	
12	16		37	3	
13	2		38	8	
14	3		39	17	
15	2		40	0	
16	1		41	6 7	
17	2		42	10	
18	4		43	3	
19	2		44	7	
20	9		45	7	
21	1		46	1	
22	4		47	0	
23	2		48	1	
24	7		49	9	
25	4		50	4	

Quilcene MRC Olympia Oyster Project
SPAT COUNT - 2017 Seeded Cultch.

Counting # of spat/shell for a random 10 shells/bag with 16 bags/plot

Recorder's Names: <i>Jackie Graham, Neil, Sarah</i>	Station Information
Deployment Date: <i>5/26/17</i>	Waterbody: Hood Canal
Monitoring Date:	Station Name: Quilcene
Time of Low tide: <i>noon</i>	Lat (WGS 84):
TEST PLOT # <u>2</u>	Long (WGS 84):

Shell	Front	Back	Shell	Front	Back
Sample #	# Olympias	# Olympias	Sample #	# Olympias	# Olympias
1	2		26	4	
2	0		27	3	
3	3		28	16	
4	2		29	15	
5	0		30	2	
6	2		31	1	
7	2		32	7	
8	6		33	5	
9	5		34	3	
10	2		35	2	
11	43		36	8	
12	6		37	0	
13	21		38	2	
14	2		39	3	
15	0		40	67	
16	07		41	12	
17	14		42	5	
18	5		43	4	
19	2		44	2	
20	1		45	17	
21	3		46	3	
22	4		47	2	
23	4		48	7	
24	07		49	5	
25	5		50	2	

Quilcene MRC Olympia Oyster Project
SPAT COUNT - 2017 Seeded Cultch.

Counting # of spat/shell for a random 10 shells/bag with 16 bags/plot

Recorder's Names: <i>Jackie Gardner, Neil Harrington</i>	Station Information
Deployment Date: <i>5/26/17</i>	Waterbody: Hood Canal
Monitoring Date:	Station Name: Quilcene
Time of Low tide: <i>noon?</i>	Lat (WGS 84):
TEST PLOT # <u>3</u>	Long (WGS 84):

Shell Sample #	Front # Olympias	Back # Olympias	Shell Sample #	Front # Olympias	Back # Olympias
1	1		26	2	
2	5		27	2	
3	3		28	3	
4	1		29	2	
5	3		30	6	
6	2		31	19	
7	2		32	7	
8	3		33	6	
9	3		34	5	
10	10		35	2	
11	1		36	7	
12	3		37	7	
13	4		38	2	
14	2		39	2	
15	2		40	3	
16	3		41	3	
17	1		42	9	
18	1		43	9	
19	5		44	4	
20	3		45	3	
21	3		46	5	
22	3		47	4	
23	4		48	3	
24	1		49	4	
25	0		50	6	

Quilcene MRC Olympia Oyster Project
SPAT COUNT - 2017 Seeded Cultch.

Counting # of spat/shell for a random 10 shells/bag with 16 bags/plot

Recorder's Names: <i>Juanita, Sarah, Cheryl, Wade</i>	Station Information
Deployment Date: <i>5/26/17</i>	Waterbody: Hood Canal
Monitoring Date:	Station Name: Quilcene
Time of Low tide: <i>noon</i>	Lat (WGS 84):
TEST PLOT # <u>4</u>	Long (WGS 84):

Shell Sample #	Front # Olympias	Back # Olympias	Shell Sample #	Front # Olympias	Back # Olympias
1	9		26	2	
2	2		27	0	
3	1		28	5	
4	6		29	6	
5	5		30	30	
6	16		31	4	
7	3		32	9	
8	31		33	8	
9	3		34	9	
10	2		35	6	
11	2		36	3	
12	0		37	0	
13	2		38	4	
14	1		39	2	
15	2		40	23	
16	1		41	3	
17	3		42	0	
18	2		43	3	
19	0		44	1	
20	1		45	14	
21	4		46	3	
22	15		47	1	
23	22		48	2	
24	11		49	5	
25	8		50	10	

Quilcene MRC Olympia Oyster Project
SPAT COUNT - 2017 Seeded Cultch.

Counting # of spat/shell for a random 10 shells/bag with 16 bags/plot

Recorder's Names: <i>Juchie, Sarah, Mary Williams</i>	Station Information
Deployment Date: <i>5/26/17</i>	Waterbody: Hood Canal
Monitoring Date:	Station Name: Quilcene
Time of Low tide: <i>noon</i>	Lat (WGS 84):
TEST PLOT # <u>5</u>	Long (WGS 84)

Shell Sample #	Front # Olympias	Back # Olympias	Shell Sample #	Front # Olympias	Back # Olympias
1	1		26	0	
2	2		27	7	
3	2		28	0	
4	3		29	0	
5	0		30	12	
6	6		31	1	
7	2		32	5	
8	3		33	3	
9	11		34	11	
10	3		35	1	
11	25		36	2	
12	4		37	9	
13	3		38	3	
14	0		39	4	
15	6		40	4	
16	6		41	12	
17	5		42	5	
18	1		43	14	
19	6		44	0	
20	3		45	0	
21	5		46	0	
22	2		47	3	
23	2		48	3	
24	3		49	5	
25	12		50	1	

Quilcene MRC Olympia Oyster Project
SPAT COUNT - 2017 Seeded Cultch.

Counting # of spat/shell for a random 10 shells/bag with 16 bags/plot

Recorder's Names: <i>Julie Cheryl, Wade, Sarah, Mary</i>	Station Information
Deployment Date: <i>5/26/17</i>	Waterbody: Hood Canal
Monitoring Date:	Station Name: Quilcene
Time of Low tide: <i>noon</i>	Lat (WGS 84):
TEST PLOT # <i>extratrop 4</i>	Long (WGS 84)

3 small bags

Shell Sample #	Front # Olympias	Back # Olympias	Shell Sample #	Front # Olympias	Back # Olympias
1	17		26		
2	11		27		
3	3		28		
4	1		29		
5	22		30		
6	3		31		
7	5		32		
8	6		33		
9			34		
10			35		
11	13		36		
12	1		37		
13	4		38		
14	6		39		
15	3		40		
16	10		41		
17	5		42		
18			43		
19			44		
20			45		
21	29		46		
22	24		47		
23	9		48		
24	9		49		
25	1		50		

3A

3B

3C

X see last 2 pages for notes about monitoring protocols Data sheet

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING				
Date:	5/25/17			
Monitors:	Chenji, Lucas, Karen Childers, Frank Handler, Pete Rhoads			
PLOT #	Center Pt Latitude:		N47.80806	
	Center Pt Longitude:		W 122.86204	
Start Time:	12:15			
(tide is into plot @ 12:30 pm)			# Quadrats w/ no shell:	11 11
QUADRAT #				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	21	20	10	14
2	26	22	23	
3	28	12	10	
4	28		15	
5			16	
6				
7				
8				
QUADRAT # 2				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	7	20		
2	28	25		
3		25		
4		15		
5				
6				
7				
8				
QUADRAT # 3				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	20			
2				
3				
4				
5				
6				
7				
8				

2:30 pm - tide in

mm

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING

Date:	5/25/17		
Monitors:			
PLOT #	1 <i>continw.0</i>	Center Pt Latitude:	
		Center Pt Longitude:	
Start Time:	12:20		
		# Quadrats w/ no shell:	

QUADRAT #				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	18	13	23	22
2	20			
3	17			
4	14			
5	7			
6	13			
7	16			
8	23			

QUADRAT #				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	20			
2	25			
3	7			
4	8			
5	5			
6 ✓				
7				
8				

QUADRAT #				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	22	15	25	16
2	20	14	19	15
3	22	18		16
4	26	17		22
5		23		12
6		25		20
7				
8				

shell 5
21 mm

Shell 6
23 mm

shell 7
20 mm

Shell 15
16 mm

Shell 14
22, 15,
25 mm

Shell 13
18, 20,
13 mm

Shell 12
21, 12
23, 13

Shell 10 = 23 mm | *Shell 8 = 20 mm*
Shell 11 = 21 mm | *shell 9 = 16 mm*

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING

Date: 5/25/17

Monitors:

PLOT # *1 continued* **Center Pt Latitude:**

Center Pt Longitude:

Start Time:

Quadrats w/ no shell:

QUADRAT #

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	<i>13</i>	<i>21</i>		
2				
3				
4				
5				
6				
7				
8				

QUADRAT #

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	<i>17</i>	<i>23</i>	<i>14</i>	<i>17</i>
2	<i>16</i>	<i>19</i>		
3	<i>16</i>			
4	<i>7</i>			
5				
6				
7				
8				

Shell 5
17

QUADRAT #

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	<i>17</i>			
2	<i>22</i>			
3				
4				
5				
6				
7				
8				

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING

Date: 5/25/17

Monitors: ~~Pete~~ Cheryl, Lucas, Karen, Frank, Pete, Rhoads

PLOT # ~~1~~ 2 **Center Pt Latitude:** N 47.80796
Center Pt Longitude: W 122.86237

Start Time: 12 pm

Quadrats w/ no shell: ~~11~~ IIIIIIIIIII

QUADRAT # ~~1~~ 1

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	12 no shell			
2				
3				
4				
5				
6				
7				
8				

QUADRAT # 2

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	12			
2				
3				
4				
5				
6				
7				
8				

QUADRAT #

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1				
2				
3				
4				
5				
6				
7				
8				

not much in quadrats but there was

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING

Date: 5/25/17

Monitors: same as plots 1 & 2 (and dollars bud)

PLOT # #3 Center Pt Latitude: N 47.80784

(X accumulation of shell) Center Pt Longitude: W 122.80278

Start Time: 12 pm N of stake & outside random quadrats

Quadrats w/ no shell: ~~IIIIII~~ VIII

QUADRAT # 1

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	18			
2	15			
3				
4				
5				
6				
7				
8				

QUADRAT # 2

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	14			
2				
3				
4				
5				
6				
7				
8				

QUADRAT # 3

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1				
2				
3				
4				
5				
6				
7				
8				

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING

Date: 5/25/17 Neil Hamilton, Frank Handler, Pete Rhoads
 Monitors: ~~Sawyer Plot~~ - Karen Childers, Sarah Eicken, Lucas Hart, Cheryl
 PLOT # 4 Center Pt Latitude: N 47.80767
 Center Pt Longitude: W 122.84319

Start Time: 11 am

Quadrats w/ no shell: 12 ~~10~~ total

QUADRAT # 2

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	15 mm	10 mm	4 mm	
2	20 mm		2 mm	
3	10 mm		2 mm	
4				
5				
6				
7				
8				

QUADRAT # 3

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	25 mm			
2	10 mm			
3				
4				
5				
6				
7				
8				

QUADRAT # 6

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	20 mm	10 mm		
2	20 mm	15 mm		
3	15 mm			
4	14 mm			
5				
6				
7				
8				

See ~~next~~ next page

PLOT 4 continued

5/25/17 Bulwer Bay Oly monitoring

QUAD 7 Shell #1

15mm

QUAD 98 - Shell #1

~~Shell #2~~

7mm

15mm

25mm

QUAD 40⁹

Shell #1

shell #2

shell #3

20

33

6

23

10

19

17

20

16

~~20~~

14

18

10

19

15

10

16

18

23

26

9

12

in out
x 10

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING

Date:		5/25/17		Phoads		Fisher Hart	
Monitors:		Karen ^{Chital} Frank		Pete Sarah		Lucas Cheryl	
PLOT #		* 5-p91		Harder		Lower	
Center Pt Latitude:		N 47.80779		Center Pt Longitude:		W 122.86340	
Start Time:		10:20 Am				# Quadrats w/ no shell:	
QUADRAT #		1					
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm	Shell 5		
1	15 mm	20 mm	15 mm	17 mm	10 mm		
2	10 mm	15 mm					
3		10 mm					
4		15 mm					
5		15 mm					
6		22					
7		18					
8							
QUADRAT #		2					
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm	Shell 5		
1	25 mm	25 mm	8	25	24		
2		27 mm	34	30			
3		30 mm	20	25			
4		22 mm	10				
5			22				
6			15				
7			12				
8			15				
QUADRAT #		L					
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm			
1	25						
2							
3							
4							
5							
6							
7							
8							

(Page 2)

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING

Date: 5/25/17				
Monitors:				
PLOT # 5 CONTINUED Page 2		Center Pt Latitude: Page 2		
		Center Pt Longitude: Page 2		
Start Time:				
				# Quadrats w/ no shell: X
QUADRAT # 5				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	25 mm	15 mm	15 mm	
2			8 mm	
3			7 mm	
4				
5				
6				
7				
8				
QUADRAT # 6				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	10 mm	13 mm		
2		15 mm		
3		23 mm		
4				
5				
6				
7				
8				
QUADRAT # 8				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	14 mm	2 mm	10 mm	
2	23 mm	17 mm		
3		12 mm		
4		13		
5		15 mm		
6		15 mm		
7		17 mm		
8		30 mm		

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING

Date:	5/25/17		
Monitors:	Pete Rhoads, Neil Harrington, Cheryl Lowe		
PLOT #	5 - Page 3	Center Pt Latitude:	Plot 5 same lat/long
		Center Pt Longitude:	
Start Time:	10:30 am		
			# Quadrats w/ no shell:

QUADRAT # (3)

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	24	28	28	
2	21	19	24	
3		16		
4		20		
5				
6				
7				
8				

QUADRAT # (7)

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	37			
2	22			
3				
4				
5				
6				
7				
8				

QUADRAT # (9)

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	18			
2	7			
3	7			
4				
5				
6				
7				
8				

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING				
Date:		5/25/17		
Monitors:				
PLOT #		5 CONT (page 4)		
		Center Pt Latitude:		
		Center Pt Longitude:		
Start Time:				
		# Quadrats w/ no shell:		
QUADRAT #		10		
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	10	10		
2	10	10		
3	11	12		
4	10	12		
5	12	15		
6		10		
7		5		
8				
QUADRAT #		13		
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	25	14	25	
2			30	
3				
4				
5				
6				
7				
8				
QUADRAT #		15		
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1				
2				
3				
4				
5				
6				
7				
8				

Plot 5 - page 5

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING

Date:	5/25/17		
Monitors:	CHERIE of ALS same		
PLOT #	52. page 5	Center Pt Latitude:	same
		Center Pt Longitude:	same
Start Time:	10:59		
		# Quadrats w/ no shell:	

QUADRAT # 11

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	10 mm			
2				
3				
4				
5				
6				
7				
8				

QUADRAT #

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	12			
2				
3				
4				
5				
6				
7				
8				

QUADRAT # 14

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	18 mm			
2	10			
3	18	18		
4	13	6		
5	32			
6				
7				
8				

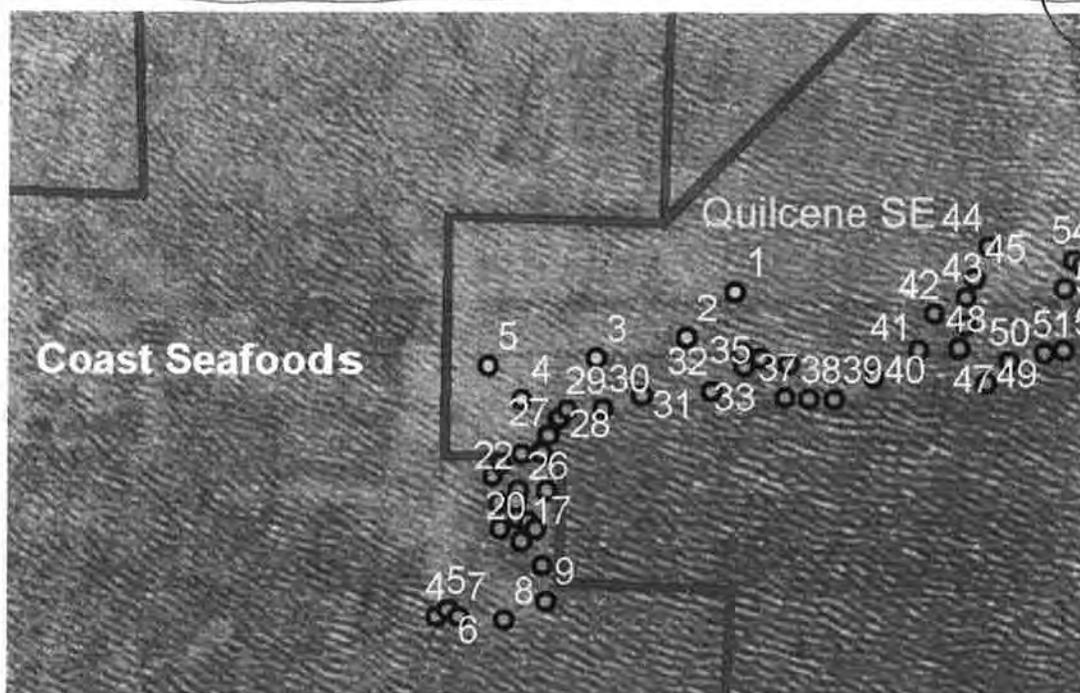
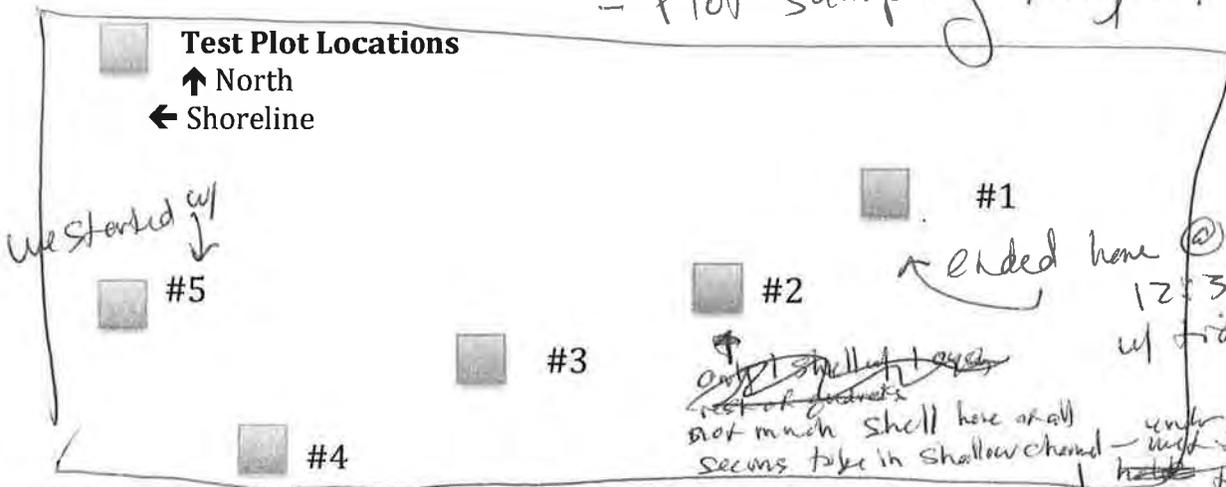
Plot 5 - page 6

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING				
Date:		5/25/17		
Monitors:		CHST + STA same -		
PLOT # 5		Center Pt Latitude:		
		Center Pt Longitude:		
Start Time:		11:11 - page 6		
			# Quadrats w/ no shell:	
QUADRAT # 16				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1	22			
2				
3				
4				
5				
6				
7				
8				
QUADRAT #				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1				
2				
3				
4				
5				
6				
7				
8				
QUADRAT #				
Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1				
2				
3				
4				
5				
6				
7				
8				

~~Plot 4 - 9 empty - Peter team~~

Quilcene Data - Olympra

- Plot sampling May 25, 2017



data sheet Notes

- no need to # quadrat in ^{each} plot - with 2 teams working, ~~working there~~
- keep track of numbers
- # was hard to keep quadrat # in order - if it doesn't matter

- 4 transects in radius line →

- ✓ start time useful - keep on data sheet
- ✓ monitor names - ~~not~~ only 1st sheet me me

Setting up transects

- use random # for compass start, then 90° ~~next~~
- random # - start from cent - count # of feet (random # from 1-4)
- 2 sides of Q - include all shell touching frame
- 2 sides of Q - do not include all shell touching frame

2017
NOTES May 25 - plot monitoring

2017 QUILCENE BAY OLYMPIA OYSTER PLOT MONITORING

Date: 5/25/17

Monitors: → note^{all} on 1st page or just note labr name?

PLOT # 3 **Center Pt Latitude:** added labr

Center Pt Longitude:

Start Time: (useful)

QUADRAT # *no need to track # - just count @ end should be 15-16* **# Quadrats w/ no shell:** sometimes also tally marks

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1				
2				
3				
4				
5				
6				
7				
8				

QUADRAT #

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1				
2				
3				
4				
5				
6				
7				
8				

QUADRAT #

Oly measured on →	Shell 1- Oly Ht mm	Shell 2 - Oly Ht mm	Shell 3- Oly Ht mm	Shell 4- Oly Ht mm
1				
2				
3				
4				
5				
6				
7				
8				