



This report must accompany all requests for payment, along with any other deliverables per the scope of work.

Olympia Oyster Restoration Feasibility: WA Harbor

Introduction

In 2012 Jamestown S’Klallam Tribe partnered with Clallam MRC and Puget Sound Restoration Fund to restore Olympia oysters on one acre of their tidelands in Sequim Bay. Grow-out bags with approximately 6,200 Olympia oyster seeds were planted on the tidelands and the following year seeded clutch bags with approximately 500,000 oysters were spread onto the tidelands. In 2014 seeded clutch bags with approximately 250,000 seeds were spread on to an additional half acre of tidelands making the total restoration site 1.5 acres. In 2015 the Olympia oyster bed had reached a size of approximately 0.67 acres with a density of 18 oysters/m².

The successful restoration effort on Jamestown’s tidelands in Sequim Bay near Blyn prompted Clallam MRC to search for other potential restoration sites in Sequim Bay; one of these sites was Washington Harbor near the mouth of the bay. The deliverables for the 2015-16 NWSC grant focused on investigating the feasibility of introducing Olympia oysters into a newly formed pocket estuary created when a dike was breached in Washington Harbor.

The first task was to reach an agreement with the landowners of suitable tidelands in Washington Harbor. The landowners were identified as Mark Burrowes, and Gaylord, Matt and Charlie Kellogs. A draft landowner agreement was sent to the four landowners in early spring 2016. Unfortunately, Mark Burrowes had concerns about giving Clallam MRC access to his tidelands and further investigation of the Kellogs’ tidelands found the area to be less suited for Olympia oyster restoration. The effort turned to the tidelands in the southern part of the harbor which could be accessed through upland owned by Battelle. A site visit May 8th found an eelgrass bed covering part of the potential site and the restoration effort in Washington Harbor was abandoned.

During the search for suitable habitats the small cove next to John Wayne Marina at Pitship Point was identified as a potential restoration site. It had previously been identified as suitable by the Washington Department of Fish and Wildlife. As restoration efforts in Washington Harbor seemed less likely, the Clallam MRC reached out to Port of Port Angeles, the owner of the tidelands at Pitship Point. A draft landowner agreement was sent to Jesse Waknitz, the Port representative on the Clallam MRC, and in early April 2016 the landowner agreement was signed by the Port of Port Angeles and Clallam County. A visit to Pitship Point May 8th identified about 0.5 acre of suitable habitat in the eastern part of the cove.

Pitship Point Restoration Effort Summer 2016

After the successful site visit May 8th the hired shellfish biologist, Victoria Cantelow, was tasked with writing a site specific Quality Assurance Project Plan using the QAPP for the Jamestown restoration effort as a template (Task 5.2 submitted concurrently).

In June, with the landowner agreement secured, the Clallam MRC started looking for funding sources to purchase Olympia oyster seeds. The Natural Resources Conservation Services was

identified as a potential source offering \$110 per seeded bag of shells. The NRCS had the following three requirements for applying for funding: 1) have a confirmed source of seeds, 2) no harvest of oysters in the restoration site, and 3) have a landowner agreement extending 1.5 years beyond introducing the oysters to the site.

Puget Sound Restoration Fund was contacted and Clallam MRC placed an order for 100 seeded bags to be delivered in the spring of 2017. The tidelands surrounding John Wayne Marina are closed year-round for shellfish harvesting by the Washington Department of Health, fulfilling the second criterion. On June 13th Lyn Muench gave a presentation to the Port of Port Angeles commissioners requesting an extension of the signed landowner agreement from December 2017 to December 2018. During the presentation one of the commissioners expressed concern about the restoration site being too close to the breakwater of the marina, fearing future permitting problems for Port maintenance or development. Based on the May 8th site visit a map of the restoration site was made and shared with the commissioners. The map depicted the site at least 50 ft. away from the breakwater alleviating the commissioner's concern (Figure 1). The landowner agreement is currently being revised into a Memorandum of Understanding.

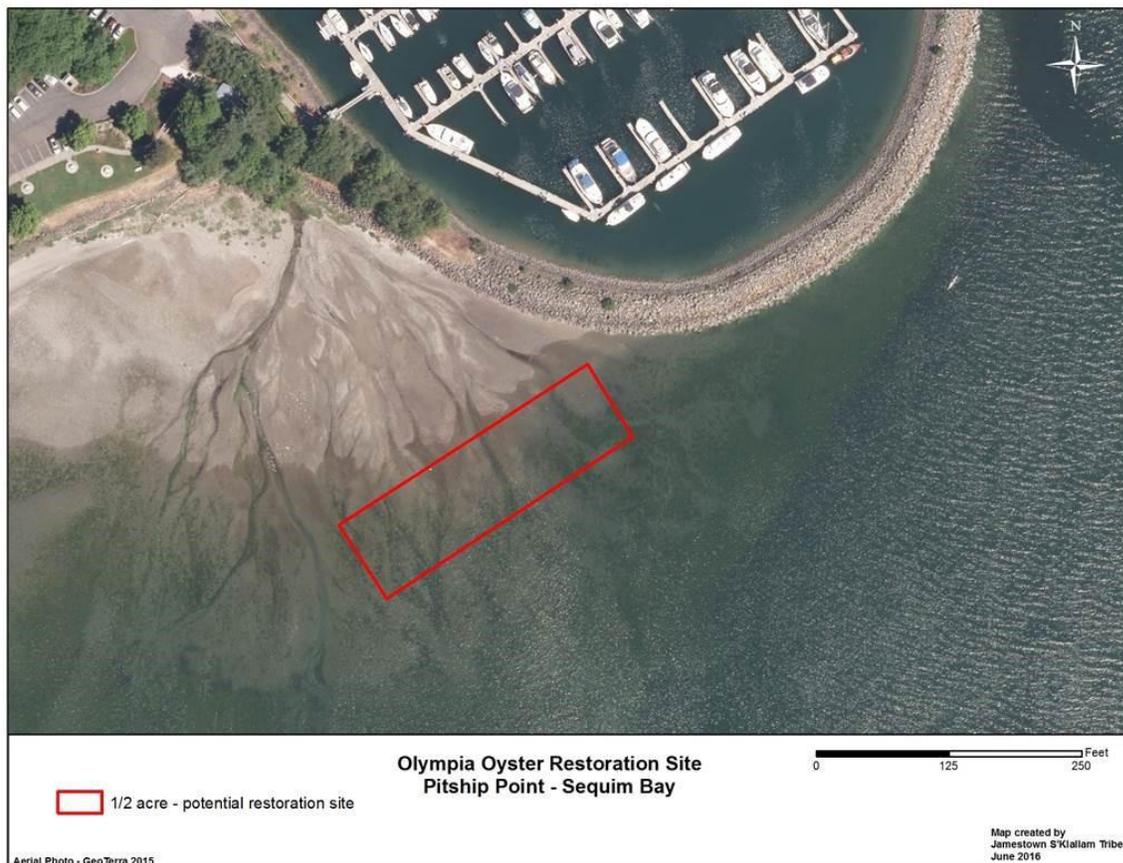


Figure 1. Olympia Oyster Restoration Site at Pitship Point.

On August 17th a team, led by shellfish biologist Ralph Riccio from the Jamestown S'Klallam Tribe, transferred two bags of seeded cultch from the cultch bags that had been beach

hardening in Blyn since early spring 2016. The team consisted of four Clallam MRC members, Jeff Ward, Ed Bowlby, Lyn Muench, Kathy Cooper, Ed's wife Sue Brancato, Emily Bishop from North Olympic Salmon Coalition, and Lucas Hart from Northwest Straits Commission. Two test plots were selected within the restoration site, one shallow and one deep. At each site one bag was opened and ten cultch were randomly selected from each bag, and oyster set counted and measured. The numbers of oysters on the shells were: Shallow Site: 15, 2, 9, 0, 1, 2, 1, 2, 0, 0; Deep Site: 1, 0, 0, 2, 0, 0, 3, 2, 0, 0. The oyster cultch was then spread at each site in a circle with a 1 meter radius. The intention is to observe survival and growth through the rest of the year and early 2017.



As described in Task 5.3 (submitted concurrently) the restoration site at Pitship Point has been classified as an enhancement project by Washington Department of Fish and Wildlife and Clallam County Department of Community Development as long as no bags, stakes or structures are placed at the site and all work is done by hand.

Jamestown Tidelands Restoration Effort Summer 2016

An Olympia oyster population survey at the Jamestown restoration site was conducted at a negative low-tide on August 17th by the same team that transferred the Olympia oysters to the Pitship Point restoration site. To eliminate bias a random sample population survey protocol was used, with seven transects laid out 25 feet apart along the base of the restoration site. A total of 51 subsamples were collected using 0.25 m² quadrats. All substrate within each sample was examined, the live and dead Olympia oysters were counted, collected and shell heights measured. If a cultch shell was partly within the quadrant, only Olympia oysters set lying within the quadrant were counted. Every quadrant with the number 3 or divisible by 3 was selected to remove and subsequently re-count and measure all oysters present. Measurement was from the hinge to the longest edge of shell. A survey grade GPS unit was used to walk the perimeter of the oyster reef and restoration site to determine the size of the surveyed area. After the field

effort the data was compiled by Ralph Riccio and emailed to Clallam MRC to be incorporated into this report.



The 2015 population survey showed that the mean oyster density fell from 30 Olympia oysters per m^2 in 2014, to 18 Olympia oysters per m^2 in 2015. This was expected because unseeded clutch was added to increase the reef. The 2014 survey was also conducted differently; subsamples were only collected from within the oyster bed area. In both 2015 and 2016 GPS locations were collected with each sample and all samples were taken into account when calculating the mean oyster density. Including those zeros in the average reduces the mean oyster density, but is a more accurate representation of the entire restoration area. In 2015 the mean oyster density within the bed was 24 Olympia oysters per m^2 . In 2015 the Olympia oyster population within the bed had increased with around 2,000 individuals to an estimated 46,620 and the oyster bed had reached a size of approximately 0.67 acres.



The 2016 population survey found a mean oyster density of 15 Olympia oyster per m^2 in the entire 1.5 acres restoration site and a density of 19 Olympia oysters per m^2 within the bed. The oyster bed had increased to a size of approximately 0.74 acres with a population estimated at 55,770 individuals. The estimate population size for the 1.5 acres restoration site was 89,510 Olympia oysters.

The following survey maps show sample locations, Olympia oyster bed areas and the location of the restoration site

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boundaries for 2014-16.

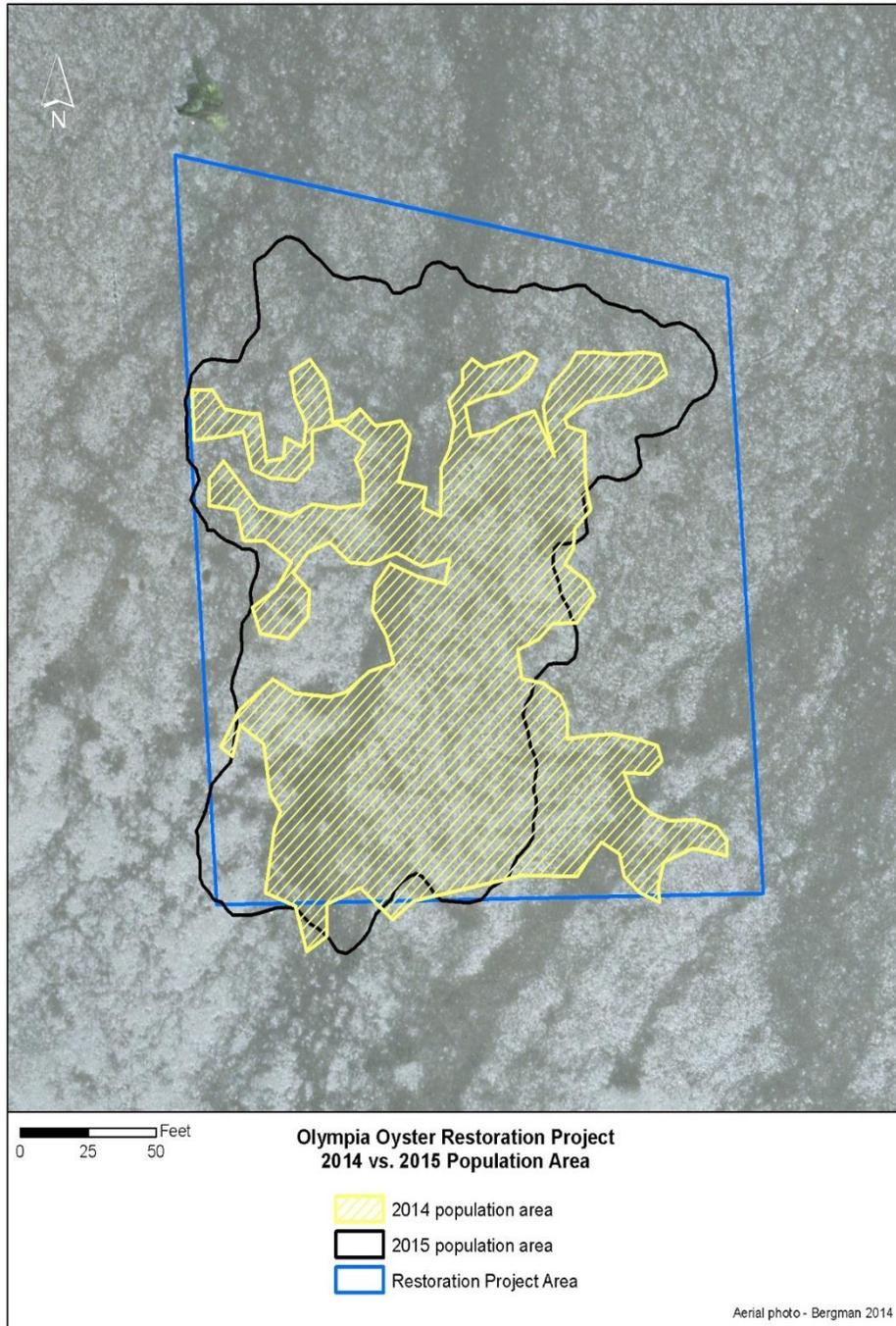


Figure 2. Estimated size of the Jamestown Olympia oyster bed in 2014 and 2015

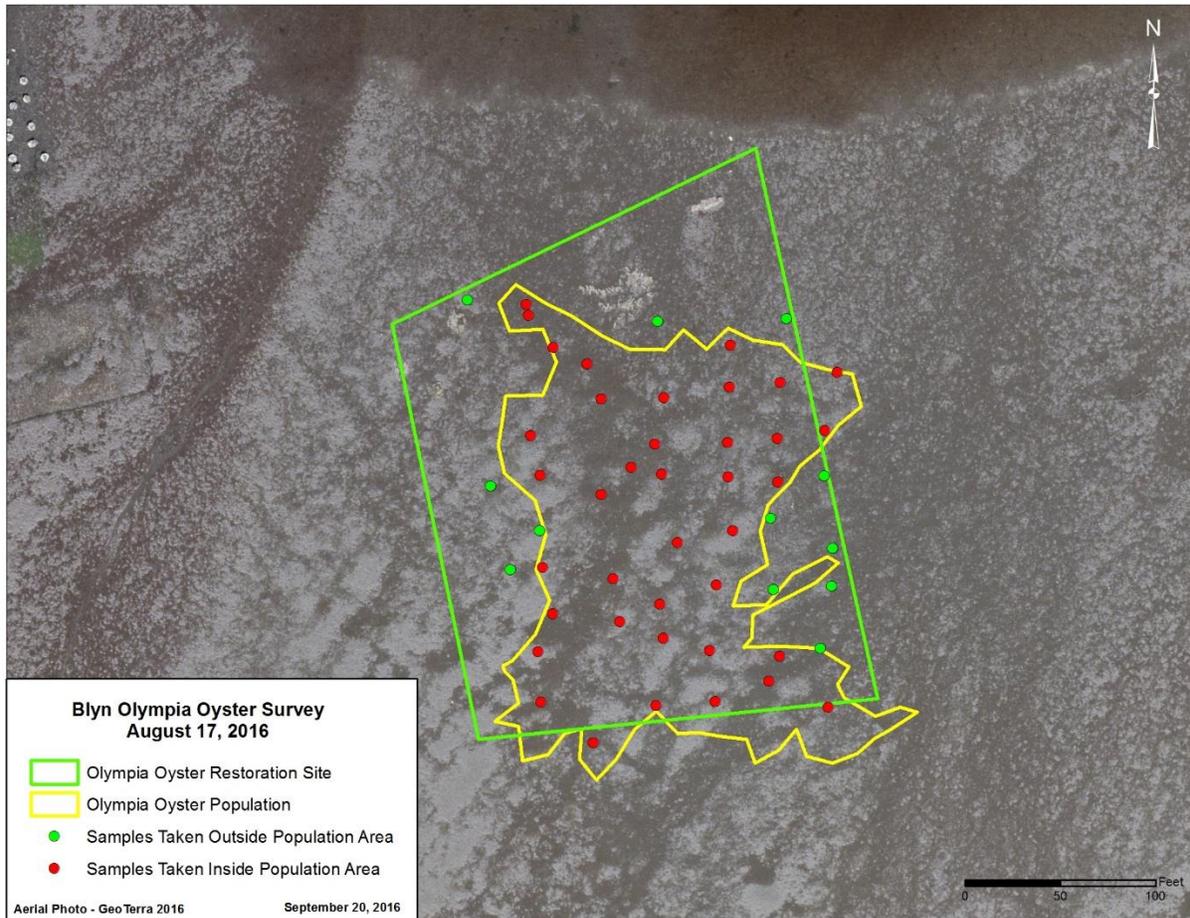


Figure 3. Estimated size of the Jamestown Olympia oyster bed in 2016

Task Number: 5.4

What was the goal of this project and did you accomplish it?

The goal was to expand the restoration efforts in Sequim Bay by identifying a new restoration site. The goal was accomplished with a few months delay because the original restoration site, Washington Harbor, proved to be not feasible. Instead another site was identified at Pitship Point.

Please provide a list of measurable outcomes or accomplishments from this project (e.g. number of people trained, miles of shoreline restored, etc.):

A landowner agreement was signed between Port of Port Angeles and Clallam County allowing Clallam MRC access to the Port's tidelands at Pitship Point. The permit process for Pitship Point restoration site was completed by WDFW and Clallam DCD classifying the site as an enhancement project. A QAPP for the site was completed. Two test plots were identified at the restoration site and two seeded clutch bags were spread at the plots. A population survey at the Jamestown restoration site estimated that the size of the bed had increased with about 8% and the population within the bed with about 16% since summer 2015.

Please list the specific deliverables associated with this project (e.g. educational/outreach materials, monitoring protocol, summary report):

Signed landowner agreement between port of Port Angeles and Clallam County
Completed permit process
Updated QAPP for Pitship Point restoration site
This final report

Any difficulties encountered or lessons learned during the project?

Reaching an agreement with landowners over access to their tidelands proved to be more difficult than expected. At the end the restoration effort will be conducted in an area with general public access.

If this task was part of an ongoing project, please provide a brief summary of the project to date, including initiation and expected completion dates, overall goals and anticipated outcomes:

This task is part of an on-going effort to restore Olympia oysters within Puget Sound, and specifically within Clallam County. This task is the initiation of a new restoration site. It is still too early to identify an expected completion date, but the goal is to restore an Olympia oyster bed on 0.5 acre at Pitship Point

Were any other resources or funding leveraged for this project?

Jamestown S'Klallam Tribe donated staff time and equipment to the project.

Did you work with any partners or other MRCs to carry out this project?

Jamestown S'Klallam Tribe, Puget Sound Restoration Fund

What are the regional cumulative significance/impacts/results of this project?

The overall goal is to restore 2 acres of Olympia oyster bed in Sequim Bay contributing to the regional Puget Sound goal of 100 acres restored by 2020.

Which NWSC Performance Benchmarks or PSP Near Term Actions does this project address?

NWSC: Nine acres of oyster habitats will be restored

PSP: Restoration of native oyster beds addresses two regional priorities: mitigation of ocean acidification and preservation of open shellfish beds through improved water quality.