Pinto Abalone Monitoring in the Strait of Juan de Fuca

PUGET SOUND
RESTORATION FUND

Clallam County
MARINE RESOURCES
COMMITTEE

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Cover Photo: Juvenile pinto abalone raised at the conservation aquaculture hatchery, tagged and ready for outplanting to restoration sites in the San Juan Archipelago. Photo by Josh Bouma.

1. Abstract

Pinto abalone restoration, through monitoring of wild populations and creation of new populations using conservation aquaculture, will help ensure the survival of this endangered species in Washington State. A critical component of this approach is filling significant knowledge gaps related to the abundance and distribution of remnant populations in the Salish Sea, including the Strait of Juan de Fuca (Strait). Existing efforts by Washinton Department of Fish and Wildlife (WDFW) and Puget Sound Restoration Fund (PSRF) to locate these populations have been opportunistic rather than deliberate; due to capacity constraints.

Through this project, Clallam County Marine Resource Committee (CCMRC) and PSRF are partnering to take an essential first step for future restoration of pinto abalone in the Strait by conducting presence/absence surveys that will be foundational to customizing a conservation, restoration, and research strategy for pinto abalone in this area. This project aims to assess abalone distribution in specific areas along the Strait to determine if and where suitable pinto abalone habitat exists. This means both noting any wild abalone, singletons or aggregations, and identifying habitat that is of the quality and size required for outplanting hatchery origin juveniles.

In this first year of the project, we surveyed areas near Protection Island and Rocky Point in eastern Clallam County. We found no wild aggregations of abalone, but found a few potential areas to consider for more detailed searches and possible collection of broodstock. We did not find any areas large enough and with adequate complexity to serve as future outplant sites. These results, while seemingly negative, are extremely beneficial to the project as they allow us to focus instead on other survey areas in the Strait. Based on the success of these initial field days, we plan to increase the amount of survey work we will accomplish next year, with a focus on abalone subregions west of Port Angeles.

2. Project Goals

The primary goals of the pinto abalone monitoring program are to determine the status and characteristics of abalone populations along the Strait, and to identify areas where future restoration efforts might occur.

In 2024, our pilot year for this collaboration, our goals were:

- To spend two dive days establishing the efficacy of using a local support vessel, the FV Salty Bell, as a dive platform for pinto abalone work, determine a workable crew size and safe diver entry/exit methods for the divers along with their gear and equipment, test GPS devices, and assess the utility of the surface buoy pull method for marking surveyed terrain with this boat and crew
- To begin surveys of some of the locations of interest (based on known depth and bathymetry) in the eastern waters of Clallam County between Protection Island and

Miller Peninsula to set ourselves up for success for the eight additional dive days in scheduled in subregions west of Port Angeles in 2025.

3. Project Engagement

So far, in addition to PSRF, this project has required close collaborations with the Northwest Straits Commission, WDFW, and a local vessel operator. More partnerships will develop as we build on this work next year.

3.1. Partners/Organizations

- Clallam County Marine Resources Committee (CCMRC)
- Puget Sound Restoration Fund
- Washington Department of Fish and Wildlife
- Michael Blanton (local boat captain)

3.2. Participants

- Three divers from PSRF planned and executed the dives, along with one additional PSRF employee topside to help manage divers and data
- The abalone team at WDFW assisted with mapping and dive location selection
- Four individuals from CCMRC assisted with planning and implementation, and one participated topside managing divers and data
- Michael Blanton captained the diveboat for fieldwork, bringing the crew to survey sites and responding to buoy pulls to mark diver trajectories with GPS location

4. Project Methods/Actions

Project Activity Summary	**Date or Period**	**Location(s)**
Dive planning meetings	Aug-Nov 2024	Virtual meetings
Dive day 1	Nov 7th 2024	Protection Island
Dive day 2	Nov 8th 2024	Rocky Point

The team's primary means to accomplish our goal of surveying habitat in the Strait was to conduct dive surveys to identify existing populations and aggregations of pinto abalone. The dive surveys followed methods already in use by WDFW and PSRF. The team worked closely with WDFW and used their existing habitat maps and institutional knowledge of suitable abalone habitat to identify starting locations for surveys. Potential habitat areas were organized into 250m by 250m numbered habitat survey squares developed by WDFW to ensure we covered all areas of potential interest.

During each of the dives, divers performed a surface buoy pull to alert the boat of their location so a GPS waypoint could be recorded approximately every ten minutes. If abalone singletons or aggregations were found, additional buoy pulls were performed to alert the survey boat. Each time there was a buoy pull, divers would record information for their surroundings underwater and dive tenders would record information for the GPS location at the time the buoy pull occurred. Divers would also record the number of abalone and number of aggregations present, if applicable, as well as the dive time, depth, substrate types, algae types, whether the site

would be appropriate for outplanting or broodstock collection, and any additional thoughts on the location. After completion of each dive, information collected by the boat crew was matched with the the diver's data to provide a complete description of the survey event. See appendix for example data sheets for the surface dive tenders and data sheets for the divers on each dive. For this reporting period our target was two days of diving with at least two one-hour dive surveys each day.

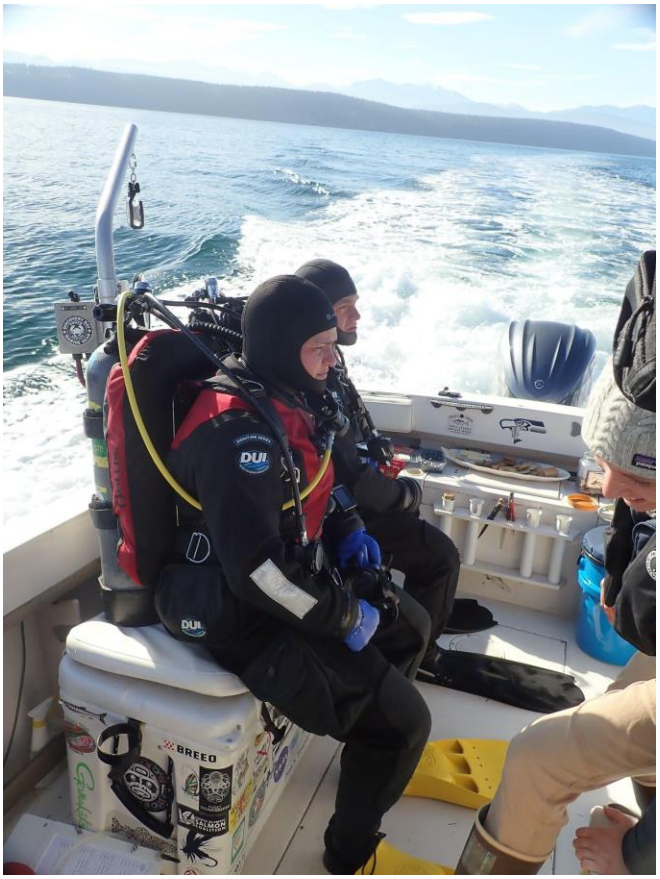


Figure 1. Divers approaching the survey start point on dive day one.

5. Results

During our two dive survey days in 2024, we completed five dives, with two dives conducted off Protection Island and three dives conducted off Rocky Point. At Protection Island, we were able to survey eight of the target survey squares; at Rocky Point, three survey squares were completed. As discussed below, we were also able to eliminate a number of survey squares from further consideration by using the boat depth sounder to determine water depth and bottom topography. While the majority of the areas we surveyed were not suitable abalone habitat and we found no adults, several of our survey areas at Rocky Point contained enough suitable habitat that they may be revisited at a later date to look for broodstock for use in the conservation hatchery program. Overall, the squares we surveyed during these two dive days likely did not contain sufficient size of quality of habitat for use as future outplant areas.

Nevertheless, as this was the first time abalone research divers had been able to survey these areas, and the information collected increased our understanding of the area and it's potential use as an outplant area.

5.1. Data Summary

We encountered some variety in habitat throughout our five surveys, as summarized in the photographs included below. Habitat was a combination of mud, sand, gravel, with occasional cobble and small boulders. Of this, the cobble and small boulders were the most promising potential abalone habitat, though no wild abalone were found. Where there was cobble or small boulders, it was generally a single layer over sand, as opposed to deeper stacks of rock that would provide more complex and cryptic habitat for abalone. As noted above our dive surveys covered squares 27, 28, 29, 36, 37, 38, 43, and 44 at Protection Island, and squares 5, 6, and 13 off Rocky Point as well as the area east of square 6 (Figures 2 and 3). We were also able to eliminate the need to conduct future dive surveys in squares 7-12 and 22-26 by using the depth sounder on the support vessel, which showed a lack of bottom structure or suitable water depths for abalone habitat.

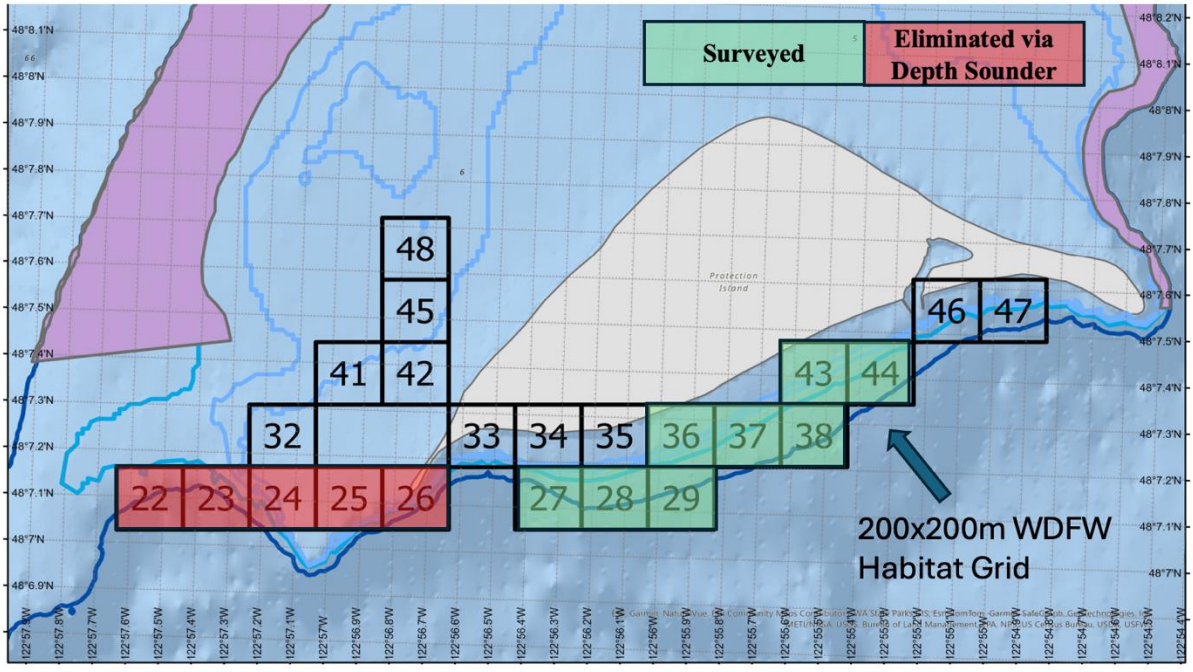


Figure 2. Habitat squares selected based on known depth and bathymetry to survey around Protection Island

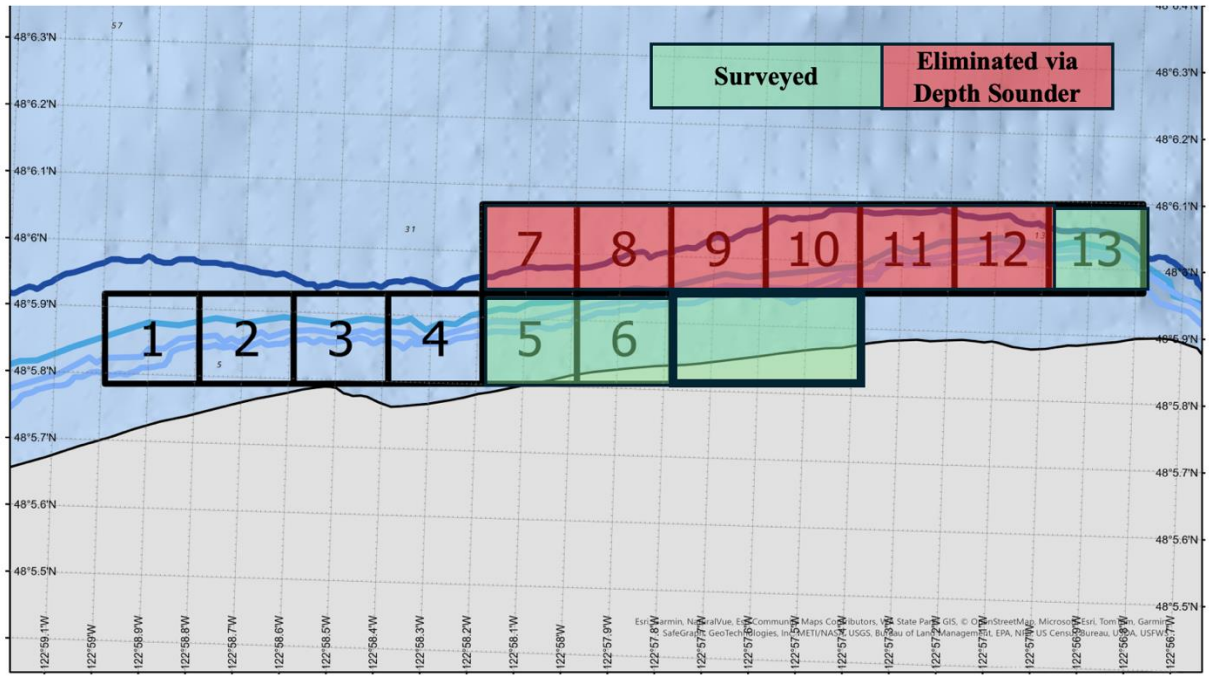


Figure 3. Habitat squares selected based on known depth and bathymetry to survey north of Rocky Point.

Figure 4. Examples of habitat encountered during dive surveys.

5.2. Outcomes

We successfully established that the methods tested by PSRF and WDFW would work on board our chartered local vessel, and made adjustments where necessary. In this case adjustments included choosing destinations fitting the goal to minimize travel time on sometimes-rough November seas, and using a combination of a portable GPS device and the boat plotter to ensure we were tracking accurate locations for our surveys. Part of the goal of this first year of work was to determine diver capabilities on the chartered vessel, and the two dive days provided us with better understanding of what travel and weather limitations might be on the vessel. This will allow us to better plan dates and locations of surveys in the future. During these dives we trained an additional PSRF diver on the methods for this project, which will give us more flexibility with personnel and scheduling in 2025. We also began work towards surveying potential abalone habitat in the Strait subregions to better understand where to focus our resources in the future.

5.3. Outputs

Tangible products from our work during this reporting period include:

- Successfully adapting existing methods to a new local survey boat
- Training an additional diver and tender on methods for these surveys
- Surveying 11 habitat squares developed by WDFW and identified one more “square” that should be included as viable habitat based on depth.
- Removing many of these habitat squares at Protection Island and Rocky Point from consideration as outplant sites
- Identifying a subset of habitat squares as areas to potentially return to to search for abalone broodstock

5.4. Results in context

These results represent the first of what will hopefully be a long term and large scale data set. In 2025, we will increase the number of dive surveys we conduct. Eventually we hope to survey a large portion of coastal habitat along the Strait that provide the depth and substrate needs for pinto abalone. As we continue surveys, if we encounter habitat of the quality and contiguous size necessary for outplants, we plan to use some of our time on the dives to establish long term outplant sites. This will involve carefully measuring an area approximately 8m by 10m between 10-40’ MLLW, marking the corners with pitons and polyline, and taking careful GPS points of each of the four corners. Results of surveys in the first dive days of 2025 will influence whether we spend the latter dive days setting up sites or simply continuing surveys.

6. Project Highlights, Innovations & Stories

This new CCMRC project has shown us the value and importance of creating local and regional partnerships to expand our work to protect and restore the marine resources in Clallam County. By working closely with PSRR, WDFW, and local vessel owners, we can begin an important new phase in addressing the loss of pinto abalone in our local waters and explaining the value of our work to the citizens of Clallam County.

As we move forward in 2025 and beyond, we hope to learn more about our local marine resources, explore ideas for supporting and expanding existing and emerging science and technology, and serving as a model for the value of cooperative partnerships in environmental restoration that can be shared locally and regionally


Figure 5. The boat and dive crew on days one and two of diving!

7. Lessons Learned

In a sense, the primary lesson learned is one we already knew: working in marine environments will always be challenging, but those challenges can be effectively addressed through careful planning and local knowledge. Given the exposed locations of our survey areas along the Strait, our work will always be weather and tide dependent. If this is acknowledged and incorporated into our planning, favorable outcomes are likely.

As a part of the survey crew, we also realized that while diver surveys can provide a wealth of information, only a small portion of an area of interest can be effectively covered in a day using this assessment method. Going forward, it will be interesting to see if we or others can develop “rapid assessment” techniques for surveying large areas of marine habitat utilizing robotic vehicles or other devices that will enable us to identify specific areas for more effcient diver surveys.

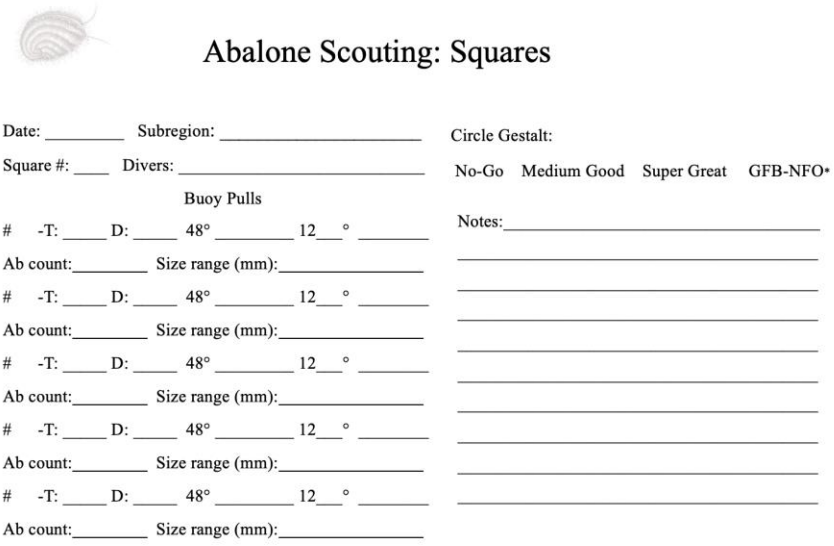
The final lesson learned involves education and outreach. During the 2024 surveys, we employed a submersible GoPro camera to record the activities of the divers at specific locations. The videos provided a “bird’s eye view” of what they were seeing and doing, and proved to be extremely popular at the recent MRC Conference in Everett, Washington. We also uploaded sections of these videos to the CCMRC website so visitors to our website can “see” what is under their local waters.We hope to continue to use approach to highlight our work locally and regionally.

8. Next Steps

While our two field days were quite successful this year, that was in part due to good luck with November weather. In 2025, we aim to have eight dive days in more exposed locations along

the Strait. Our next steps will be to plan the locations and dates of 2025 fieldwork carefully to ensure we operate within the reasonable limits of diving on the Salty Bell (limited weather protection and limited protected seating for long transits), or to arrange for other local boat charters or to use boats from partner organizations if required, during certain times of the year or for certain sites we need to survey.

Appendices



Abalone Scouting: Squares

Date: _____ Subregion: _____

Square #: ____ Divers: _____

Buoy Pulls

-T: _____ D: _____ 48° _____ 12___° _____

Ab count:_____ Size range (mm):_____

-T: _____ D: _____ 48° _____ 12___° _____

Ab count:_____ Size range (mm):_____

-T: _____ D: _____ 48° _____ 12___° _____

Ab count:_____ Size range (mm):_____

-T: _____ D: _____ 48° _____ 12___° _____

Ab count:_____ Size range (mm):_____

-T: _____ D: _____ 48° _____ 12___° _____

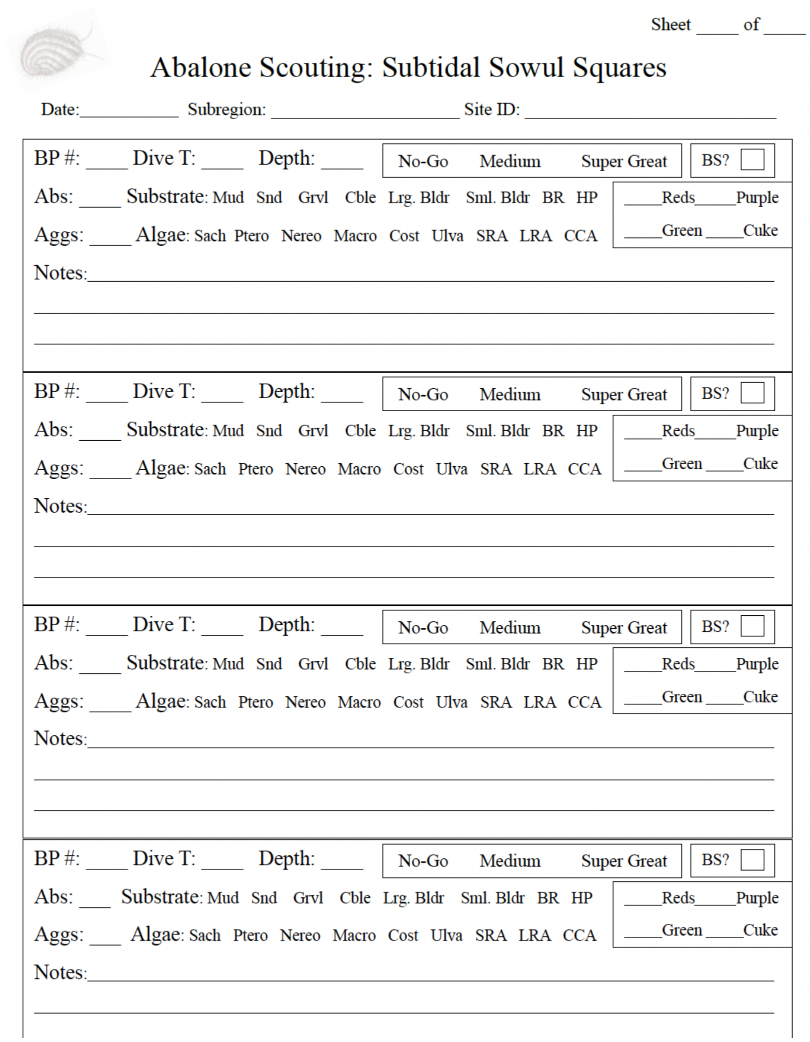
Ab count:_____ Size range (mm):_____

Circle Gestalt:

No-Go Medium Good Super Great GFB-NFO*

Notes:_____

Figure 6. Example surface data sheet for an abalone habitat scouting dive.


Sheet ____ of ____

Abalone Scouting: Subtidal Sowul Squares

Date:__________ Subregion: __________________ Site ID: ________________________

BP #: ____ Dive T: ____ Depth: ____ | No-Go Medium Super Great | BS? ☐

Abs: ____ Substrate: Mud Snd Grvl Cble Lrg. Bldr Sml. Bldr BR HP | ____Reds____Purple

Aggs: ____ Algae: Sach Ptero Nereo Macro Cost Ulva SRA LRA CCA | ____Green ____Cuke

Notes:____

BP #: ____ Dive T: ____ Depth: ____ | No-Go Medium Super Great | BS? ☐

Abs: ____ Substrate: Mud Snd Grvl Cble Lrg. Bldr Sml. Bldr BR HP | ____Reds____Purple

Aggs: ____ Algae: Sach Ptero Nereo Macro Cost Ulva SRA LRA CCA | ____Green ____Cuke

Notes:____

BP #: ____ Dive T: ____ Depth: ____ | No-Go Medium Super Great | BS? ☐

Abs: ____ Substrate: Mud Snd Grvl Cble Lrg. Bldr Sml. Bldr BR HP | ____Reds____Purple

Aggs: ____ Algae: Sach Ptero Nereo Macro Cost Ulva SRA LRA CCA | ____Green ____Cuke

Notes:____

BP #: ____ Dive T: ____ Depth: ____ | No-Go Medium Super Great | BS? ☐

Abs: ___ Substrate: Mud Snd Grvl Cble Lrg. Bldr Sml. Bldr BR HP | ____Reds____Purple

Aggs: ___ Algae: Sach Ptero Nereo Macro Cost Ulva SRA LRA CCA | ____Green ____Cuke

Notes:____

Figure 7: Example underwater data collection sheet for abalone habitat scouting dives.