Project Title/Task: Clallam MRC Year Two Bull Kelp

Summary

Period covered: October 1, 2022 – September 29, 2023

Date: 09/29/2023

Grant No: SEANWS-2021-CLCoCD-00006

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2023 Kelp Monitoring

Introduction

In 2023 Clallam MRC continued the collaboration with the Northwest Straits Commission on the kelp monitoring project. The goal was to monitor the size and density of kelp canopies at three locations during low-tide events between July and September 2023.

The expected outcomes were 1) to use established methods to produce georeferenced density data to be incorporated into SoundIQ, and potentially the Department of Natural Resources database; 2) to contribute georeferenced density data which can be used to evaluate longer-term trends, and support environmental decision-making.

Kelp Surveys in Freshwater Bay

Three surveys were conducted in Freshwater Bay in August. On August 14th a monitoring survey was conducted by Alan Clark, Jeff Ward, Alisa Taylor, and Joanne LaBaw. On August 31st two monitoring surveys were conducted by Alan Clark, Ann Soule, and Alisa Taylor.

Large Kelp Bed, August 14 and 31 2023

Freshwater Bay's large kelp bed was surveyed on two separate days, as the first effort only allowed surveyors to map the North half of the bed, due to high winds and waves nearshore. The first survey of the large kelp bed East of the boat ramp was conducted by four surveyors, Alan Clark, Jeff Ward, Alisa Taylor, and Joanne Labaw. The survey was initiated at 8:07 am with a tidal elevation of -1 ft. and the initial GPS perimeter was completed at 9:08 am. After paddling back to the Western boundary of the bed, surveyors initiated a second GPS perimeter mapping only a small portion of the nearshore edge of the bed, starting at 10:00 am, and stopped without completing the full bed perimeter at 10:20 am, for safety reasons due to breaking waves. On August 31, three surveyors, Alan Clark, Alisa Taylor, and Ann Soule, returned to map a perimeter line for the nearshore edge of the bed. The survey was initiated at 10:13 am with a tidal elevation of -1 ft. and completed at 11:21 am. Including data from the GPS tracks from the first survey (the North boundary of the bed) and the second survey (the South boundary), the perimeter of the kelp bed was approximately 4.12 miles and the total kelp bed area was approximately 121.98 acres (Figure 1). The water temperature nearest to shore ranged from 53-56°F and the water depth ranged from 5-30 ft. Farthest from shore, the water temperature ranged from 52-55°F, and the depth ranged from 14-27 ft. The temperature monitoring data which was conducted in 2021 at this kelp bed, was not repeated this year; this may be reinstated during coming years' kelp surveys. Most of the area was dominated by Nereocystis leutkeana ("Bull kelp"). In previous years, Macrocystis pyrifera ("Giant kelp") was present in large numbers throughout the center of the kelp bed. This year, there was less Macrocystis throughout the main bed. There were some larger and healthy patches of Macrocystis mixed with Nereocystis, making for a higher density than what was present in 2022 located along the Southeast perimeter of the bed. There were also some isolated clumps of Macrocystis, and mixed Macrocystis and Nereocystis, in a few areas near the Southern perimeter of the kelp bed, and often extending toward the shoreline. Nereocystis and Feather Boa kelp (Egregia menziesii) were mixed in the shallow areas, extending toward the shore as well. Sparsely fringing Nereocystis extended significantly along the Northernmost (farthest from shore) and Eastern boundary of the bed. The kelp seemed to be

healthy overall, and was more dense, consistent, and connected than it was in 2022. The kelp supported many epiphytic algae (brown & green) and bryozoan colonies. There was evidence of some mild sun bleaching on both Nereocystis and Macrocystis (Figures 2 and 3). The survey datasheets are provided in Appendix A.

Figure 1. The map of the large kelp bed at Freshwater Bay based on the field GPS readings taken Aug 14th and 31st, 2023.

The kelp bed sizes between 2016 and 2023 are summarized in Table 1.

Table 1. Large kelp bed size between 2016 and 2023.

Date	Area (acres)
August 2023	121.98
July 2022	41.85
July 2021	128.52
August 2020	112.67
July 2019	117.86
July 2018	78.0
August 2017	174.7
July 2016	141.1

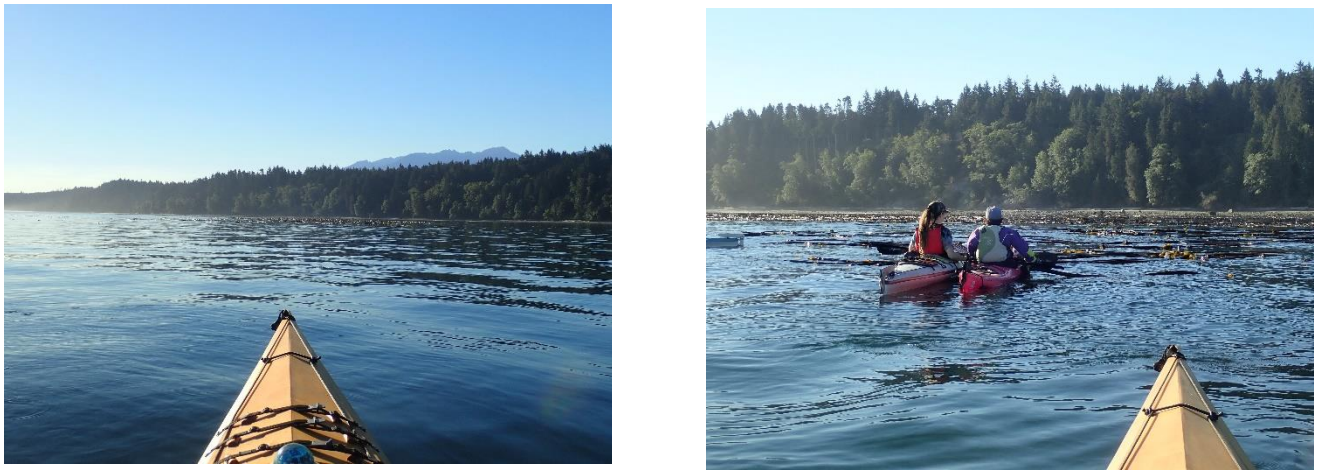

Figure 2. Pictures of the large kelp bed in Freshwater Bay taken during the Aug 14, 2023, survey.

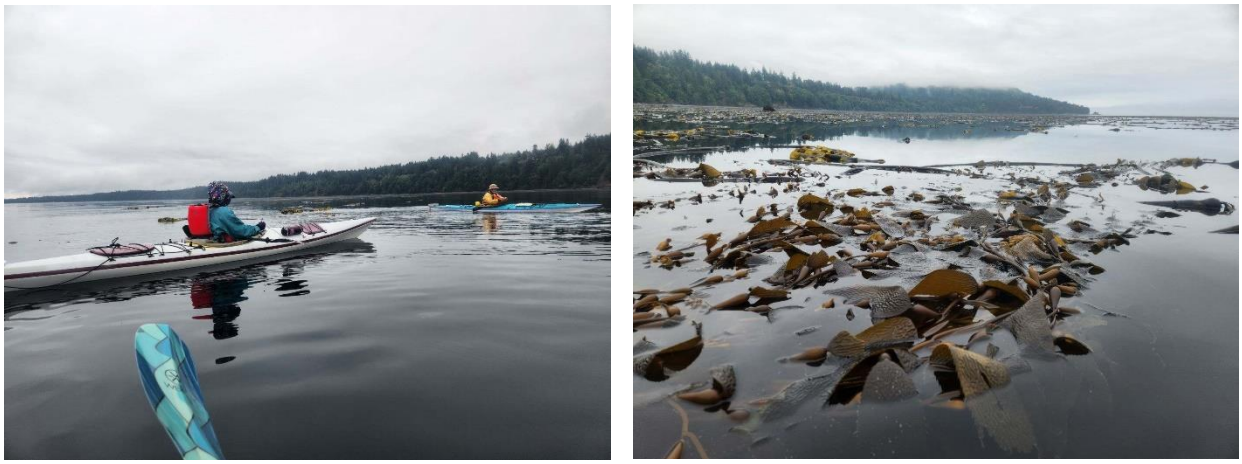

Figure 3. Pictures of the large kelp bed in Freshwater Bay taken during the Aug 31, 2023, survey.

Freshwater Bay Small Kelp Bed Survey, August 31, 2023

Three surveyors, Alan Clark, Ann Soule, and Alisa Taylor conducted a survey of the small kelp bed West of the Freshwater Bay boat ramp. The survey was initiated at 9:07 am with a tidal elevation of -1.3 ft. and completed at 9:31 am. The additional, northern region of the kelp bed (not included with the main bed) was surveyed as well, initiated at 9:44 am and completed at 9:52 am. The perimeter of the main kelp bed was approximately 0.33 miles, and the total area of the main kelp bed was approximately 0.55 acres (Figure 4). The water temperature nearest to shore ranged from 54-56°F and the water depth ranged from 3-8 ft. Farthest from shore, the water temperature ranged from 52-54°F, and the depth ranged from 24-46 ft. The entirety of the kelp bed -- Southwest of Bachelor Rock as well as Northeast of the Rock -- was dominated by Nereocystis leutkeana. The kelp bed was well connected this year around the outer edge of Bachelor Rock, as well as through the gap between Bachelor Rock & the shoreline. This made for a larger kelp bed area than what is included in just the main surveyed bed, continuous with the bed of Nereocystis present in the bay North of the Rock. In 2022 and previous years, the northernmost bed was composed of a mixture of Macrocystis and Nereocystis; this year, Macrocystis was entirely absent. The kelp seemed to be healthy overall and supported a plethora of red & brown epiphytic algae and bryozoans. Bachelor Rock hosts a dense colony of purple urchins, yet the vitality of the kelp in this area appears to have maintained a relative consistency. Figure 5 presents photos from the survey. The survey datasheets are provided in Appendix A.

Figure 4. The map of the small kelp bed at Freshwater Bay based on the field GPS readings taken August 31, 2023.

The kelp bed sizes between 2016 and 2023 are summarized in Table 2.

Table 2. Small kelp bed size between 2016 and 2023.

Date	Area (acres)
August 2023	0.55
July 2022	0.78
September 2021	0.93
August 2020	0.64
July 2019	0.97
August 2018	1.06
September 2017	0.92
July 2016	0.71

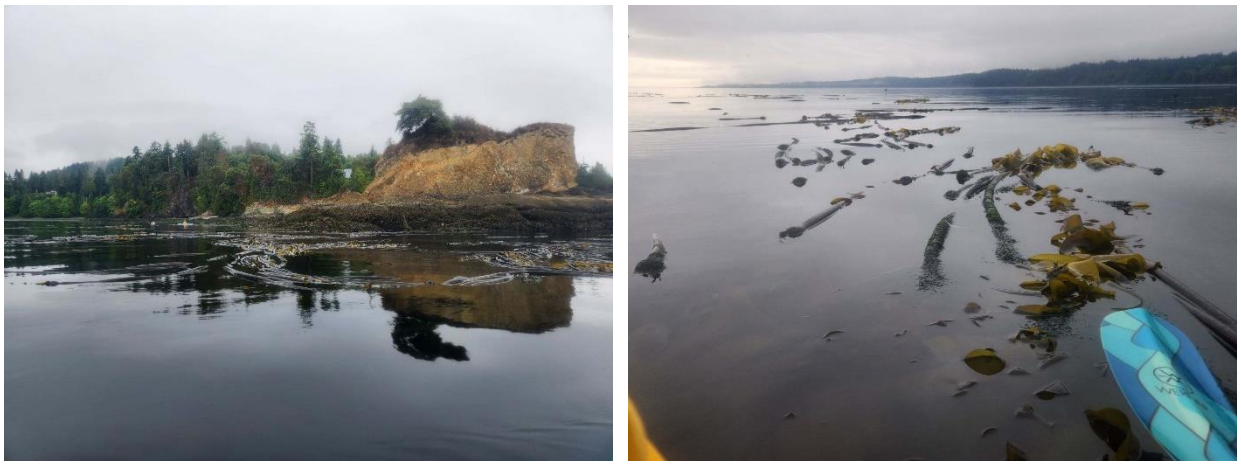

Figure 5. Pictures of the small kelp bed in Freshwater Bay taken during the 2023 survey.

Kelp Survey in Clallam Bay September 2, 2023

Three surveyors, Alan Clark, Alisa Taylor, and Joanne Labaw conducted a survey of the kelp bed identified in Clallam Bay during 2016's land-based reconnaissance survey. The survey was initiated at 10:13 am with a tidal elevation of 0 ft. and completed at 10:47 am. The South border of the bed was not possible to survey in entirety due to high winds and breaking waves. Taking into consideration that the measured perimeter of this bed does not reflect its full size due to the exclusion of some of the southern portion of the kelp, the perimeter of the kelp bed was approximately 0.75 miles, and the total kelp bed area was approximately 9.61 acres (Figure 6). Unfortunately, the survey team forgot to bring the tools for measuring water depth and temperature along, so the depth and temperature data are not available. One depth measurement of 6 ft was taken at the start of the survey using a kayak paddle, along the edge closest to shore. The bed consisted of a mix of Nereocystis leutkeana and Macrocystis pyrifera, with Macrocystis more densely present at the center of the bed. Sparsely fringing Nereocystis extended beyond the perimeter of the main bed, especially along the Northernmost (farthest from shore) boundary. Nereocystis mixed with Macrocystis, as well as Feather Boa kelp (Egregia menziesii) & Sea Palm kelp (Postelsia palmaeformis) extended toward the shoreline along much of the southern boundary. Along the rocks to the west was a thick patch of Nereocystis, disconnected from the main

bed. The kelp bore many bryozoan colonies on their blades, as well as red & brown epiphytic algae. The kelp seemed to be healthy overall, and quite thick & dense throughout the main bed. There was a little evidence of sun bleaching on both Nereocystis and Macrocystis. Figure 7 presents photos from the survey. The survey datasheets are provided in Appendix A.

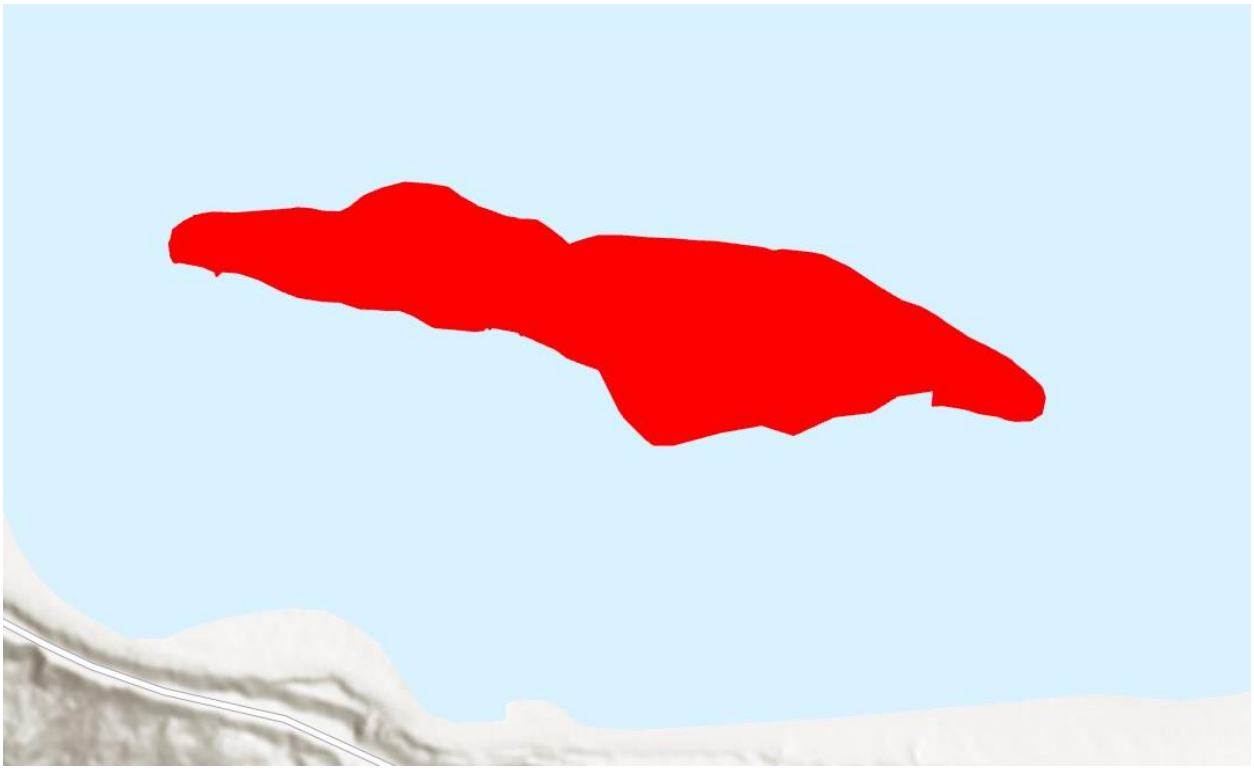

Figure 6. The map of the kelp bed in Clallam Bay based on the field GPS readings taken September 2, 2023.

The kelp bed sizes between 2017 and 2023 are summarized in Table 3.

Table 3. Kelp bed size between 2017 and 2023.

Date	Area (acres)
September 2023	9.61
August 2022	12.73
August 2021	15.32
July 2020	13.14
July 2019	22.3
July 2018	18.8
July 2017	25.1

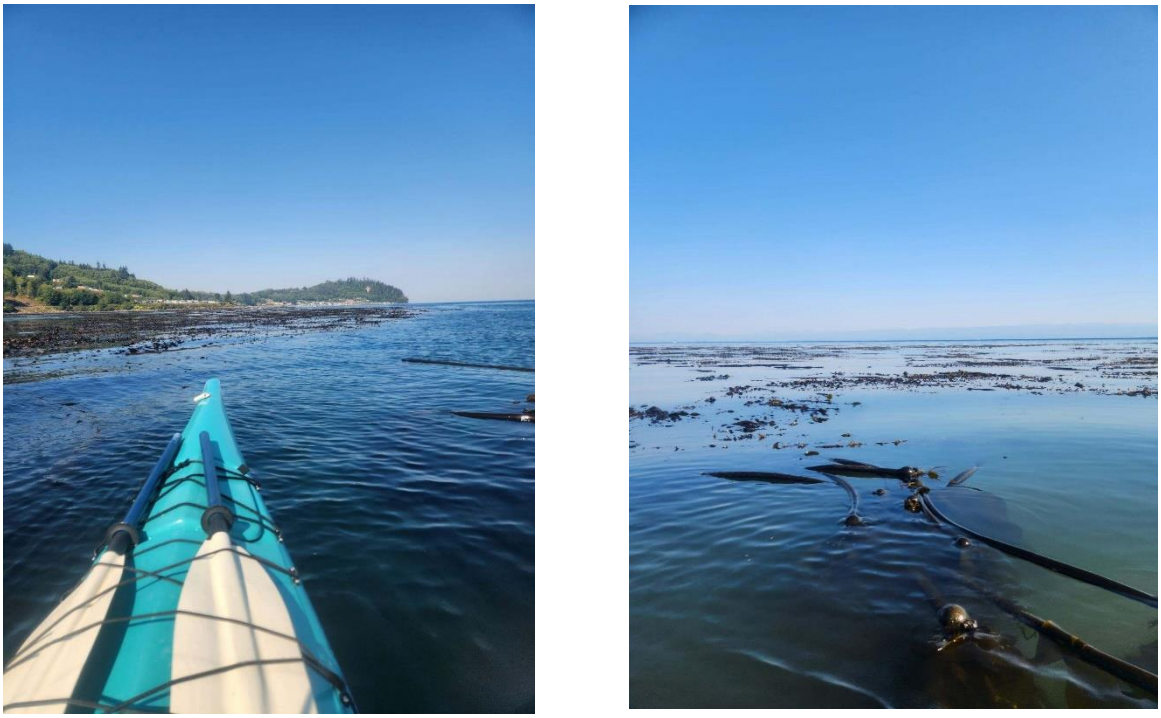

Figure 7. Pictures of the kelp bed in Clallam Bay taken during the 2023 survey.

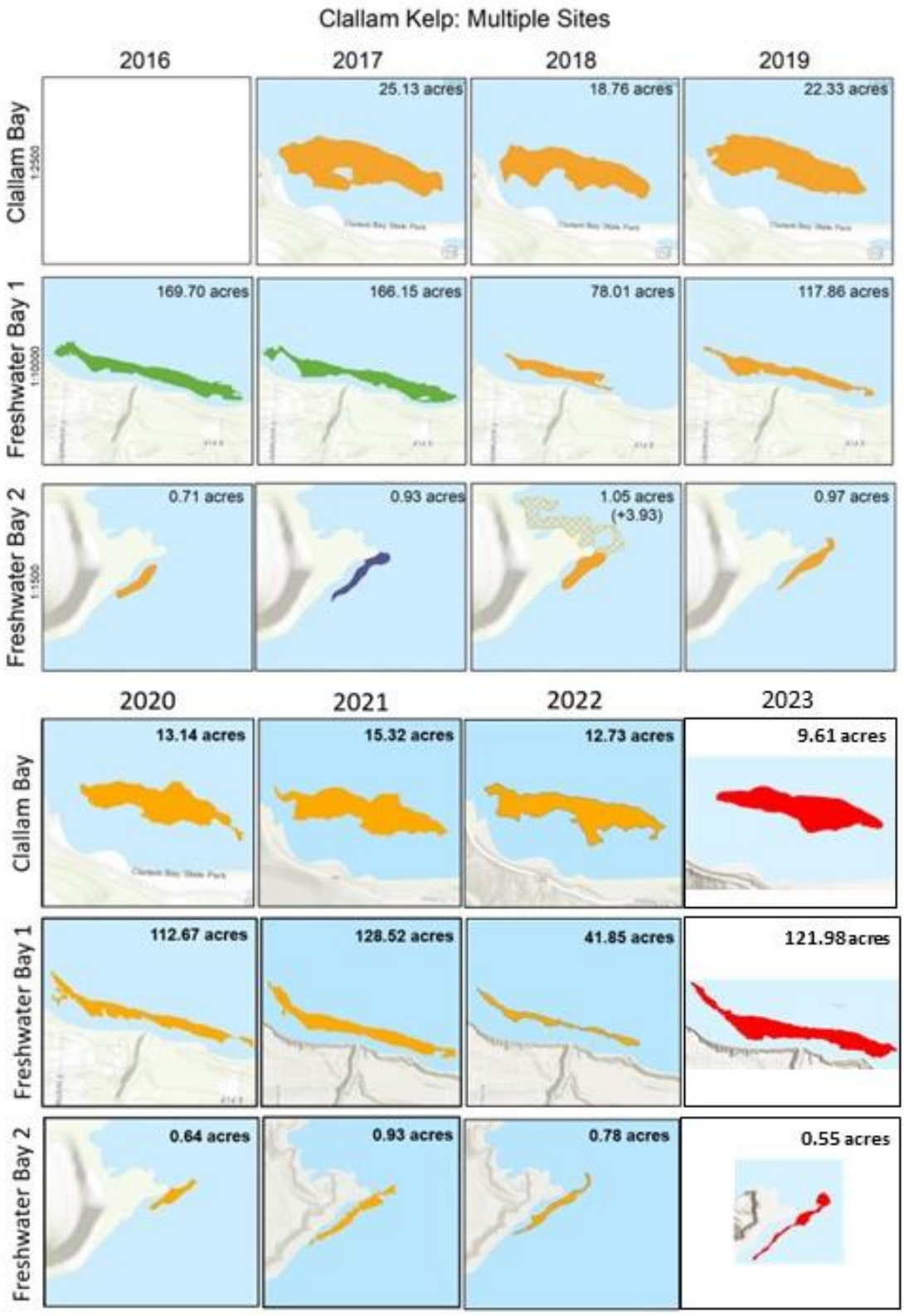

Figure 8. Area (acres) of each of the 3 Clallam County kelp beds, 2016-2023.

Appendix A – Field Data Sheets

See separate file in Uploads