SUBMITTED TO:
Washington State
Department of Ecology
300 Desmond Drive
Olympia, WA 98503

BY:
Shannon & Wilson
400 N. 34th Street, Suite 100
Seattle, WA 98103

(206) 632-8020
www.shannonwilson.com

YEAR 10 MITIGATION MONITORING REPORT

Custom Plywood Mill Site

ANACORTES, WASHINGTON

SHANNON & WILSON

January 23, 2025

Shannon & Wilson No: 112788-001

Submitted To: Washington State Department of Ecology
300 Desmond Drive
Olympia, WA 98503
Attn: Susannah Edwards and Angela Harkins

Subject: YEAR 10 MITIGATION MONITORING REPORT, CUSTOM PLYWOOD MILL SITE, ANACORTES, WASHINGTON

Shannon & Wilson prepared this report and participated in this project as a consultant to the Washington State Department of Ecology. Our scope of services was specified in Agreement Number C2400186 dated April 10, 2024. This report presents our Year 10 mitigation monitoring observations and was prepared by the undersigned.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or we may be of further service, please contact us.

Sincerely,

SHANNON & WILSON

Elyse Denkers, PWS
Biologist/Permit Specialist

Sarah Corbin, PWS, MSES
Senior Biologist/Permit Specialist

EBD:SCC:AJS:KLW/ebd:scc

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1 INTRODUCTION

Shannon & Wilson was contracted by the Washington State Department of Ecology (Ecology) to provide Year 10 (2024) mitigation monitoring services at the Custom Plywood Mill Site in Anacortes, Washington (Site) (Ecology Cleanup Site ID 4533). The Site is located on portions of tax parcels P33197, P33198, and P33199, along the west shoreline of Fidalgo Bay (Section 30, Township 35N, Range 02E) (Figure 1).

This Year 10 monitoring report documents the project's progress towards the achievement of the Year 10 goals and performance standards.

2 PROJECT BACKGROUND

As described in the Custom Plywood Monitoring Contract Scope of Work (Scope of Work), "In 2008, the Washington Department of Ecology (Ecology) and GBH Investments, LLC, the Potentially Liable Person for the Custom Plywood Mill Site in Anacortes, WA (Site; Cleanup Site ID: 4533), entered an Agreed Order for cleanup of hazardous substances at the Site. Following the Agreed Order, Ecology assumed active management of Site cleanup." During the 2011 Phase I Site remediation efforts, temporary on-site wetland impacts occurred. As part of the cleanup's permitting process and to offset the cleanup-related wetland impacts, Ecology oversaw the creation of an on-site wetland and buffer mitigation site, as described in the September 2011 "Conceptual Wetland Mitigation Plan for the Custom Plywood Interim Remedial Action," hereafter referred to as the "Mitigation Plan" (Hart Crowser, 2011). The Mitigation Plan is Appendix B to Ecology's Phase I Final Cleanup Action Plan. As required by the project's regulatory permitting agencies, Ecology's Toxics Cleanup Program has completed mitigation monitoring at the mitigation site since 2012 (see Section 2.1).

2.1 Monitoring History

The wetland mitigation site is described in the Mitigation Plan, with additional supporting information provided in the recorded Wetland Notice for Deed Notification (hereafter referred to as the "Deed Notification") (Ecology, 2012). The Deed Notification laid out the monitoring report requirements and schedule, which includes a minimum of 10 years of monitoring. Mitigation goals and associated performance standards are established in the Mitigation Plan.

The construction of the mitigation began in 2011 with the initial excavation of the to-be-restored wetland area. During the Phase II cleanup efforts in 2013, the excavated wetland area was connected to Fidalgo Bay. Due to the staggered mitigation implementation activities in 2011 and 2013, we understand that there are two monitoring schedules for the wetland mitigation complex. The monitoring schedule for the upland buffer and backshore mitigation areas began in 2011, and the monitoring schedule for wetland hydrology and vegetation monitoring began in 2013.

Performance monitoring criteria for the restored beach profile, epibenthic zooplankton, forage fish, and nearshore fish were met by 2017, and monitoring of these four elements ceased, as approved by the agencies. As of 2022, the Samish Nation and non-profit organizations continue to periodically monitor the site and its vicinity for wildlife use, including nearshore fish use. Ecology periodically coordinates with those entities to stay apprised of general conditions and species usage.

During the Phase III cleanup, existing eelgrass in the cleanup area was first transplanted to adjacent locations and then shallow subtidal sediment was remediated. Eelgrass transplant mitigation monitoring is summarized in detail in the January 25, 2023, Ecology letter to the U.S. Army Corps of Engineers (Corps) (Ecology, 2023). Within the 2023 Ecology letter, it was recommended that the eelgrass transplant area continue to be monitored to evaluate temporal and spatial changes in coverage at and adjacent to the Site. Shannon & Wilson's scope did not include eelgrass monitoring, and it is not addressed in this report.

2.2 Monitoring Progress

Exhibit 2-1 (as adapted from the January 25, 2023, Ecology letter to the Corps) summarizes each monitoring element, past progress towards performance standards, previous recommendations, and the years each element was monitored.

Exhibit 2-1: Summary of Monitoring Elements and Status, as of 2022

Monitoring Element	Performance Criteria	Performance Criteria Met?	Comments and Recommendations	Years Monitored
Physical monitoring (beach profile)	Beach profiles will not change by more than +/- 1.5 feet by Year 5	Yes	Performance criteria met by Year 1 (2015); monitoring ceased.	Year 0 (2014) Year 1 (2015)
Epibenthic zooplankton	Densities on restored beach comparable to or greater than reference beach any given year	Yes	Performance criteria met by Year 1 (2015); monitoring ceased.	Year 0 (2014) Year 1 (2015)
Forage fish spawning	Substrate composition along upper beach suitable for forage fish spawning over a minimum of 50% of beach area in any given year	Yes	Performance criteria met by Year 4 (2017); monitoring ceased.	Year 1 (2014) Year 2 (2015) Year 4 (2017)
Nearshore fish	Use on restored beach comparable to or greater than reference beach any given year	Yes	Performance criteria met by Year 4 (2017); monitoring ceased.	Year 1 (2014) Year 2 (2015) Year 4 (2017)
2014 eelgrass transplants	No temporal loss of eelgrass productivity	No	Continued monitoring recommended; see details in January 25, 2023, Ecology letter (Ecology, 2023).	Year 1 (2015) Year 2 (2016) Year 5 (2019) Year 7 (2021) Year 8 (2022)
	By 2015, 50% or greater colonization	Yes	Performance criteria met by Year 1 (2015).	
	By 2019, recovery of the 2,915 sf at a similar density to a reference bed	TBD	Transplant area contracted between Year 2 (2016) and Year 5 (2019); continued monitoring recommended to assess natural variability.	
Wetland vegetation (component of mitigation area)	Year 3: 40% cover of native shrubs and emergent vegetation	Yes	Year 3 (2016) performance criteria met.	Year 1 (2014) Year 2 (2015) Year 4 (2017 Year 5 (2018) Year 6 (2019) Year 8 (2021; qualitative survey) Year 9 (2022; qualitative survey)
	Year 5: 50% cover of native shrubs and emergent vegetation	Yes	Year 5 (2018) performance criteria met.	
	10% or less cover by invasive vegetation	Yes	Performance criteria met for percent cover of invasives.	
	12,000 sf or more of cover by native estuarine plant species	Yes	Performance criteria met for square feet of native estuarine plants.	
	100% cover of wetland by tidal waters at approx. MHHW (defined as +8.3 feet MLLW)	Yes	Performance criteria met for tidal water cover at defined height.	

Monitoring Element	Performance Criteria	Performance Criteria Met?	Comments and Recommendations	Years Monitored
Backshore and upland buffer vegetation (component of mitigation area)	Year 5: 50% or greater cover of native tree, shrub and groundcover species	No	Additional maintenance recommended.	Year 1 (2012) Year 2 (2013) Year 3 (2014) Year 4 (2015) Year 6 (2017) Year 7 (2018) Year 8 (2019) Year 10 (2021; qualitative survey) Year 11 (2022; qualitative survey)
	Year 7: 60% or greater cover of native tree, shrub and groundcover species	Yes	Year 7 criteria met for tree, shrub, and groundcover.	
	10% or less cover by invasive vegetation	No	Invasive coverage appeared to slightly exceed 10% in 2022; maintenance recommended.	

NOTES:
No monitoring activities were conducted in 2023.
MHHW = mean higher high water; MLLW = mean lower low water; sf = square feet; TBD = to be determined

The most recent monitoring was conducted by Ecology in 2022 to complete the Year 9 qualitative monitoring for the wetland vegetation element and the Year 11 backshore and upland buffer vegetation element. Ecology's monitoring observations that are most relevant to this report are excerpted below from their 2023 letter (Ecology, 2023).

> *Riparian/Upland Buffer: The southern and southwestern riparian area/upland wetland buffer generally contained a mixture of healthy native trees and shrubs including maple, alder, pine, snowberry and widespread vigorous Nootka rose (see photos on pages 14 and 15 [of Ecology letter]).*
>
> *While the southern riparian buffer has many well-established, healthy natives, bindweed and Himalayan blackberry are prevalent along the edge of the riparian buffer and the stormwater drainage swale closest to the Tommy Thompson trail. Other non-natives species within the riparian [buffer] included common dune tansy, burr chervil, Canadian thistle, bull thistle and curled dock.*
>
> *The north riparian buffer contained many large, vigorous Nootka rose as well as healthy currant, snowberry, and oceanspray. Many of the trees on the northern wetland buffer appear to be stunted in height compared to trees on the southern side but are otherwise healthy in appearance.*
>
> *Wetland and Wetland Backshore: The wetland contained well-established spear saltbush (Atriplex patula), pickleweed (Salicornia virginica), [and] sea club rush (Scirpus maritimus). Pickleweed was prolific and appeared to be expanding within the mudflat area and extended into the drainage swale. Along the wetland backshore saltgrass (Distichlis spicata) was thriving, and American dune grass (Leymus mollis) and beach rye grass were present. It*

appears the dunegrass is continuing to spread laterally and grow denser. Organic matter accumulating in the wetland has coincided with emergent plants expanding to lower elevations of the wetland that were previously mudflat. Native vegetation also appears to have expanded shoreward. Some invasives were noted including white sweet clover, [and] common dune tansy. Riddle dock and reed canary grass was observed in the stormwater drainage swale.

Ecology noted that performance criteria were met for native plant species cover within the wetland, backshore, and upland buffer mitigation areas. Invasive species cover criteria were not met within the upland buffer area, which slightly exceeded the 10% threshold.

Ecology recommended the removal of invasive species within the upland buffer. They also recommended additional tree and shrub plantings (including irrigation) along the stormwater drainage swale. Following these maintenance tasks, Ecology recommended that a final qualitative and quantitative assessment of the wetland, backshore, and upland buffer areas be conducted in 2023. An assessment did not take place in 2023. The Year 10 monitoring site visit provided the recommended qualitative and quantitative site assessment as described in the section below. Although the Year 10 monitoring site visit occurred in 2024, which is effectively the eleventh year following the start of wetland hydrology and vegetation monitoring, we evaluated compliance with the Year 10 goals and performance standards.

3 YEAR 10 GOALS AND PERFORMANCE STANDARDS

The following goals and associated performance standards were established in the Mitigation Plan for Year 10:

Goal 1: Restore wetland areas through installation of native vegetation.

- Performance Standard: 80% areal coverage of native shrubs and emergent vegetation.

Goal 2: Restore buffer areas through installation of native vegetation.

- Performance Standard: 80% areal coverage of native tree, shrub, and groundcover species.

Goal 3: Control invasive plant species within the wetland and buffer areas.

- Performance Standard: 10% or less areal coverage of invasive plants.

Goal 4: Provide adequate hydrologic connection for restored wetland.

- Performance Standard 1: Visual observation of 100% tidal inundation of marsh mitigation area at tidal elevation of approximately mean higher high water (MHHW), during a normal tidal cycle each year.
- Performance Standard 2: Documented coverage of 12,000 square feet or greater areal cover of native emergent estuarine species.

4 METHODOLOGY

4.1 Desktop Review

Prior to completing the monitoring site visit, the following background materials were reviewed:

- Wetland Notice for Deed Notification, Custom Plywood Interim Remedial Action Site, Phase I, Anacortes (Ecology, 2012).
- Ecology's Phase I Final Cleanup Action Plan, Appendix B – the Mitigation Plan.
- Previous monitoring report letters from 2022, 2021, and 2017 (Ecology, 2023, 2022, and 2017).

Using information obtained from review of the background documents, we prepared a Wetland Mitigation Complex Monitoring Work Plan that details the Site's progress towards meeting the Mitigation Plan's goals, specified the Year 10 field monitoring methods, and outlined the Year 10 monitoring report requirements (Shannon & Wilson, 2024).

4.2 Site Visit Methodology

Year 10 monitoring methods are consistent with those described in the Mitigation Plan. Two Shannon & Wilson Professional Wetland Scientists completed the Year 10 vegetation monitoring site visit on July 16, 2024 (Figure 2). A second site visit was completed on August 28, 2024, to collect tidal inundation data. This section describes the methods used to assess each Year 10 performance standard.

4.2.1 Vegetation Monitoring

To quantify percent areal coverage of native and invasive plant species, nine pre-determined transect lines, ranging from 75 to 200 feet in length, were established by Hart Crowser within the wetland, backshore, and upland buffer mitigation areas. These transect locations are not physically marked on the Site but are represented in the Scope of Work figures provided by Ecology. During our site visit, we approximated the transect

locations using the Scope of Work figures and Google Earth to identify the start and stop locations of each transect on the Site, and recorded their locations using an ESRI Collector application utilizing an EOS Arrow 100 Global Positioning System (GPS) device.

The line-intercept method was used at each transect to determine percent cover. Length of native tree, shrub, groundcover, and emergent species crossing the vertical space above and below the transect lines was recorded. Because the performance standards are established for aggregated native cover, and not separately by stratum, only the start and stop locations of a continuous stretch of native vegetation, which included overlapping native strata, was noted. The species forming each unit of cover along the transect were noted. The same method was applied to non-native species. These coverage lengths were totaled and divided by the total transect length to generate the percent areal cover of native vegetation and non-native vegetation.

Additionally, the overall areal coverage of emergent estuarine plant species was measured using the EOS Arrow 100 GPS to determine native estuarine plant coverage.

4.2.2 Photo Points

During the vegetation monitoring site visit, we took photos from each established photo point (Figure 3). Like the vegetation monitoring transects, the photo points are not physically marked on the Site. Their locations were approximated using the Scope of Work figures.

4.2.3 Tidal Inundation

The Scope of Work requires that tidal inundation monitoring occur at the MHHW, which is defined in the Deed Notification as +8.3 feet relative to Mean Lower Low Water (MLLW). We completed the secondary site visit on August 28, 2024, to observe the extent of marsh vegetation that is inundated by the National Oceanic and Atmospheric Administration's predicted tide of +8.3 feet MLLW (based on predictions at the Swinomish Slough Station ID 9448682) (National Oceanic and Atmospheric Administration [NOAA], 2024).

5 YEAR 10 MONITORING RESULTS

5.1 Site Conditions

The weather during the July 16, 2024, wetland monitoring site visit was clear and sunny, with temperatures in the low 80s degrees Fahrenheit. We were present on the site for the majority of the day. The tidal inundation monitoring site visit on August 28, 2024, occurred

in the afternoon, during the 3:54pm +8.3 MLLW tide. During our August site visit, the weather was clear and sunny, with temperatures in the mid-60s degrees Fahrenheit.

5.2 Wetland Vegetation

The Year 10 performance standard provided in Section 3 requires that native wetland vegetation areal cover exceed 80%. Three of the monitoring transects (Transects 5, 6, and 7) represented the wetland plant communities.

We observed abundant numbers of all of the emergent species identified in the Mitigation Plan's plant schedule for the wetland planting area. These were saltmarsh bulrush (*Bolboschoenus maritimus*), saltgrass (*Distichlis spicata*), and pickleweed (*Salicornia pacifica*). As an aside, the scientific names of saltmarsh bulrush and pickleweed have changed since the 2011 Mitigation Plan was developed. Other observed dominant wetland emergent species include spear saltbush (*Atriplex patula*), seaside arrowgrass (*Triglochin maritima*), and Baltic rush (*Juncus balticus*). Although spear saltbush was introduced from Eurasia, it is generally considered a naturalized estuarine species and is not excluded from the native wetland emergent cover data. Other observed species in the wetland, at smaller coverage amounts, included spikerush (*Eleocharis palustris*), sea plantain (*Plantago maritima*), and Puget Sound gumweed (*Grindelia integrifolia*).

The native wetland vegetation cover along the three transects ranged from 64% to 100%, with an average cover of 89%. The native wetland areal cover meets the Year 10 performance standard. Appendix B contains the data for each transect. A summary of data collected using the line-intercept method and general observations for each wetland transect are provided in Exhibit 5-1.

Exhibit 5-1: Year 10 Wetland Emergent Vegetation Areal Cover

Transect # (length)	Length of Emergent Vegetative Native Cover (feet)	Percent Aerial Cover of Native Emergent Species	Notes
T5 (100 feet)	100	100	This transect was dominated by pickleweed, saltgrass, arrowgrass, spear saltbush, and Baltic rush. Saltmarsh bulrush was present in trace amounts.
T6 (100 feet)	99	99	This transect was dominated by Baltic rush, saltgrass, pickleweed, and spear saltbush.
T7 (75 feet)	48	64	This transect was dominated by spear saltbush.
Average Percent Cover[1]:		**89**	

NOTE:

1 Average cover = (total length of cover/total length of transects)

Although quantitative areal cover data was not collected in Ecology's 2022 mitigation monitoring, a comparison of photos demonstrates that the wetland emergent vegetation has continued to expand over the past two years. Areas that were depicted as bare mudflat now support dense patches of emergent species, particularly saltmarsh bulrush. Generally, a large patch of saltmarsh bulrush stretches along the wettest, inner portion of the wetland adjacent to remaining mudflat, with a thick band of saltgrass and pickleweed-dominant emergent community in the outer portion of the wetland (Exhibits 5-2 and 5-3). Saltgrass, pickleweed, and spear saltbush extend into much of the stormwater swale. Overall, the mitigated wetland supports a healthy, diverse array of estuarine wetland emergent plants. A variety of large woody debris was observed throughout the wetland (Exhibit 5-3).

Exhibit 5-2: Dense Emergent Wetland Vegetation in the Mitigated Wetland

Photograph taken on August 28, 2024, facing north.

Exhibit 5-3: Dense Emergent Wetland Vegetation and Large Woody Debris in the Wetland

Photograph taken on August 28, 2024, facing southwest near Photo Point 5.

5.3 Buffer Vegetation

The Year 10 performance standard provided in Section 3 requires that native buffer vegetation areal cover exceeds 80%. Two of the buffer monitoring transects represented areas with upland woody vegetation (Transects 1 and 2) and four represented the backshore plant communities (Transects 3, 4, 8, and 9).

Dominant native species in the more elevated portion of the buffer included black cottonwood (*Populus balsamifera*), bigleaf maple (*Acer macrophyllum*), Douglas-fir (*Pseudotsuga menziesii*), snowberry (*Symphoricarpos albus*), Nootka rose (*Rosa nutkana*), and oceanspray (*Holodiscus discolor*). The backshore was dominated by American dunegrass (*Leymus mollis*), small bedstraw (*Galium trifidium*), spear saltbush, silver beach bur (*Ambrosia chamissonis*), sea-rocket (*Cakile maritima*) (a naturalized marine shoreline plant), and beach sandspurry (*Spergularia macrotheca*). Less dominant species observed along the buffer transects included salal (*Gaultheria shallon*) and Puget Sound gumweed. Of note, trees in the southern end of the western buffer planting area near Transect 1 showed signs of stress. One bigleaf maple tree was dead and another had leaf browning and some leaf drop. A nearby Douglas-fir also showed some signs of stress (droopy branches and some patches of

slight discoloration). Around the stressed trees, a robust native shrub community grew densely.

The native buffer vegetation cover along the transects ranged from 25% to 100%, with an average cover of 82%. The native buffer areal cover meets the Year 10 performance standard. Appendix B contains the data for each transect. A summary of data collected using the line-intercept method and general observations for each buffer transect are provided in Exhibit 5-4.

Exhibit 5-4: Year 10 Buffer Vegetation Areal Cover

Transect # (length)	Length of Buffer Vegetative Native Cover (feet)	Percent Areal Cover of Native Buffer Species	Notes
T1 (200)	169	84.5	This transect was dominated by Nootka rose, black cottonwood, snowberry, bigleaf maple, and Douglas-fir. Oceanspray was also present.
T2 (190 feet)	175	92	This transect was dominated by Nootka rose, snowberry, and oceanspray. American dunegrass, yarrow, and silver beach bur were also present.
T3 (100 feet)	100	100	This transect was dominated by spear saltbush, American dunegrass, and small bedstraw.
T4 (100 feet)	100	100	This transect was dominated by American dunegrass and spear saltbush. Silver beach bur was also present.
T8 (100 feet)	25	25	This transect is dominated by spear saltbush and beach sandspurry. Silver beach bur, saltgrass, and sea-rocket were also present.
T9 (100 feet)	76	76	This transect is dominated by American dunegrass, spear saltbush, silver beach bur, and sea-rocket. Puget Sound gumweed was also present.
Average Percent Cover[1]:		**82**	

NOTE:

1 Average cover = (total length of cover/total length of transects)

5.4 Invasive Plant Cover

Throughout the vegetation mitigation monitoring period, invasive, nonnative plant cover of plant species, particularly those on the Skagit County Noxious Weed List, cannot exceed 10% in the wetland and buffer areas. When applicable, the Skagit County noxious weed class is identified below in parentheses following the species name.

Invasive species noted along the wetland transects was limited to hedge bindweed (*Calystegia sepium*), which was creeping into the Site from the fence bordering the Tommy Thompson Trail along the stormwater swale. The average invasive species areal cover on wetland transects was 3%. Several other invasive species were adjacent to the stormwater

swale and in drier portions of the swale, such as English ivy (*Hedera helix*, Class C), white sweet clover (*Melilotus albus*), common tansy (*Tanacetum vulgare*, Class B), reed canarygrass (*Phalaris arundinacea*, Class C), and Himalayan blackberry (*Rubus armeniacus*, Class C).

Invasive species areal cover along the buffer transects ranged from 7% (Transect 3) to 81% (Transect 1), with an average cover of 24% (Exhibit 5-5). The species observed along the transects were Himalayan blackberry, common tansy, Queen Anne's lace (*Daucus carota*, Class C), and sowthistle (*Sonchus arvensis*, Class C). Other invasive species we observed in the buffer that did not coincide with a buffer transect were bull thistle (*Cirsium vulgare*, Class C), Canada thistle (*Cirsium arvense*), and hedge bindweed. Invasive species on the Site buffers exceeded the 10% areal cover performance standard.

Exhibit 5-5: Invasive Species in the Site Buffer

Photograph taken on July 16, 2024; hedge bindweed and Himalayan blackberry on left, and bull thistle, common tansy, and bindweed on right.

5.5 Wetland Hydrologic Connection

5.5.1 Tidal Inundation

To assess whether the wetland has an adequate hydrologic connection, the Year 10 tidal inundation performance standard required that 100% of the wetland vegetation be inundated by tidal waters at the MHHW (+8.3 MLLW). We were on the Site for the +8.3 MLLW tide on August 28, 2024, at 3:54pm. Water was observed throughout much of the wetland's interior (Exhibit 5-6); however, we did not observe surface tidal flow entering the wetland during the +8.3 MLLW (Exhibit 5-7). The Mitigation Plan and the early monitoring reports identify the original wetland surface water inlet/outlet at the wetland's center, which connected the mitigation area to open water. That area has since filled with beach material and a different inlet/outlet has developed at the wetland's southern end. The red arrow in Exhibit 5-7 identifies the wetland's current inlet/outlet in relation to the +8.3 MLLW tide. Review of historic photos on Google Earth suggests that the original inlet/outlet naturally

filled in prior to July 2018 (Google Earth Pro, 2024). The outlet modification is likely a result of the dynamic erosion and deposition processes typical of shoreline systems.

Exhibit 5-6: Water in the Wetland Interior on August 28, 2024

Exhibit 5-7: The Site Beach During the +8.3 MLLW Tide on August 28, 2024

Photograph taken on August 28, 2024, facing southwest. Red arrow indicates current wetland inlet/outlet.

5.5.2 Emergent Plant Cover

The establishment of wetland plants is the second component used to evaluate whether the wetland has an adequate hydrologic connection. The performance standard requires that native emergent estuarine species cover a minimum of 12,000 square feet.

Using the EOS Arrow 100 GPS, we measured the extents of native emergent estuarine species, documenting 13,535 square feet of estuarine species. The restored wetland meets the performance standard.

5.6 Photo Points

The photos taken at each of the ten photo points can be found in Appendix A. The photo point locations are shown in Figure 3 and provide a qualitative assessment of the Site.

5.7 Wildlife Observations

During the vegetation monitoring, passerine birds were observed in and near the Site. Browse or other wildlife damage was not observed on planted vegetation. During the tidal inundation monitoring site visit, a great blue heron was observed fishing in the wetland (Exhibit 5-8). We also observed fish swimming in the water and what appeared to be two dead surf smelt in the ponded area.

Exhibit 5-8: Great Blue Heron Fishing in Wetland on August 28, 2024

5.8 Human Disturbance

During both site visits, we observed people with dogs walking along the Site's beach. The dogs played in the water, occasionally running through the outer extents of the wetland vegetation (the area closest to the beach). Trash was observed in the wetland in several locations. No indication of prolonged human activity, such as worn trails, transient encampments, or accumulated garbage, were observed on Site.

6 MAINTENANCE RECOMMENDATIONS

The following actions need to be taken to support the achievement of the performance standards.

- The invasive weeds in and adjacent to the stormwater swale should be removed.
- The invasive weeds in the Site buffer should be removed, with additional frequent spot removals following the initial removal effort. Given the extent of current invasive areal cover in the buffer, we recommend assessing the need for additional plantings following removal of the invasives. In some areas, the invasive species are growing along or on top of native species, while elsewhere their removal may leave unvegetated patches ripe for more invasive species establishment.

7 CONCLUSIONS

The Year 10 mitigation monitoring observations demonstrate that the performance standards and associated goals related to native wetland and buffer areal cover have been met, while the performance standard for invasive weed cover has not been met (Exhibit 7-1). The Site does not meet the tidal inundation performance standard and does meet the native estuarine emergent species cover performance standard; both standards are intended to evaluate if the wetland has an adequate hydrologic connection to support wetland function. Although the tidal inundation performance standard is not met, the overall goal to provide the wetland with an adequate hydrologic connection has been met, as evidenced by the flourishing native estuarine vegetation community and the fish and wildlife habitat. Further, the Site wetland is exhibiting functions typical of lagoons or other estuarine shoreline systems, including sediment trapping, floodwater storage, and coastal protection.

Exhibit 7-1: Year 10 Mitigation Performance Results

Goal	Year 10 Performance Standard	Metric	Goal / Performance Standard Met	Results
Restore wetland areas through installation of native vegetation	Native Wetland Vegetation Areal Cover	≥ 80% Cover	Yes/Yes	Native wetland vegetation areal cover averages 89%, meeting this performance standard.
Restore buffer areas through installation of native vegetation	Native Buffer Vegetation Areal Cover	≥ 80% Cover	Yes/Yes	Native buffer vegetation areal cover averages 82%, meeting this performance standard.
Control invasive plant species within the wetland and buffer.	Invasive Weed Cover	≤10% Cover	No/No	Average invasive weed areal cover is 1% in the wetland and 24% in the buffer.
Provide adequate hydrologic connection for restored wetland	Visual Observation of Wetland Inundated at MHHW (+8.3 MLLW)	100% of wetland inundated	Yes/No	Although the wetland is not inundated at +8.3 MLLW tide, the wetland has adequate hydrology and is providing associated wetland functions.
	Native Estuarine Emergent Species Areal Cover	≥ 12,000 square feet	Yes/Yes	Native estuarine emergent species cover 13,535 square feet.

≥ = greater than or equal to; ≤ = less than or equal to

8 CLOSURE

The findings and conclusions documented in this report have been prepared for specific application to this project. They have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area. The conclusions and recommendations presented in this report are professional opinions based on interpretation of information currently available to us and made within the operational scope, budget, and schedule constraints of this Project. No warranty, express or implied, is made.

Shannon & Wilson has prepared a document, "Important Information About Your Wetland Delineation/Mitigation and/or Stream Classification Report," to assist you and others in understanding the use and limitations of our reports.

9 REFERENCES

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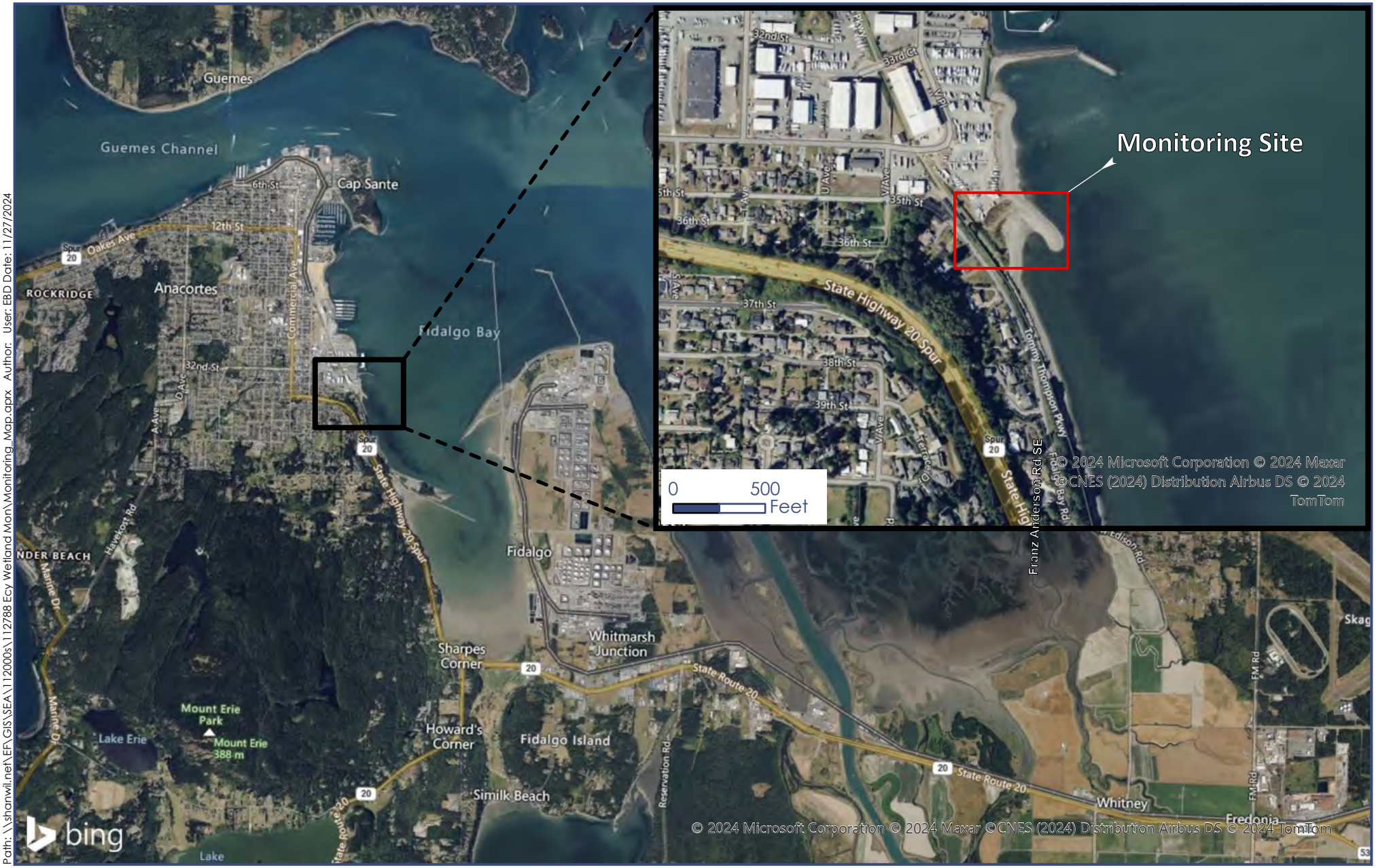
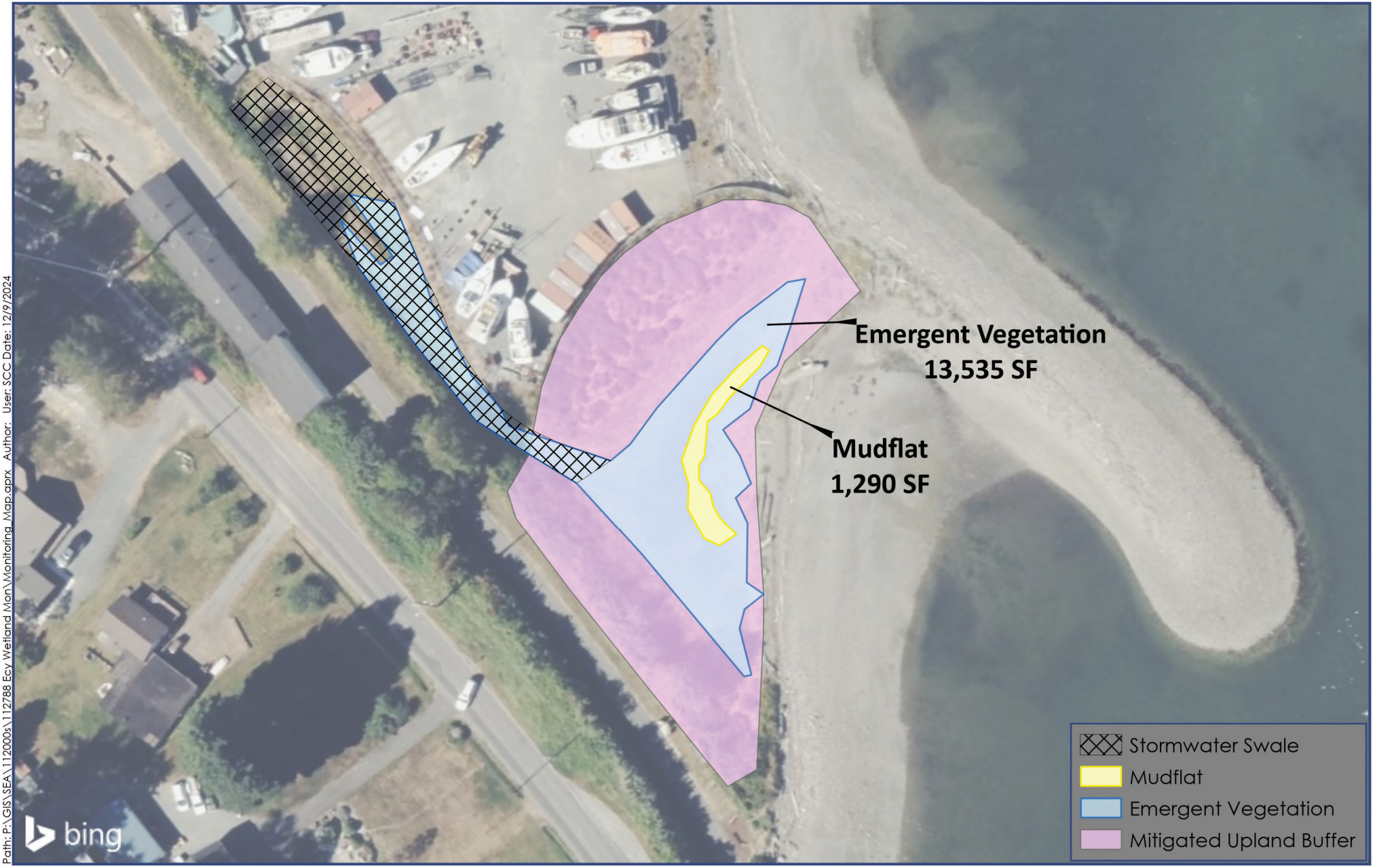


Path: \\shanwil.net\EF\GIS\SEA\112000\112788 Ecy Wetland Mon\Monitoring_Map.aprx Author: User: EBD Date: 11/27/2024

January 2025

Vicinity Map

Figure 1



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N 0 100 Feet

Notes:
1. The 2024 emergent vegetation and mudflat boundaries displayed in this figure were located in the field with the ESRI Collector application utilizing an EOS Arrow 100 GPS device.
2. The stormwater swale and mitigated upland buffer are based on the locations established in the scope of work for the 2024 monitoring services. These locations were approximated based on the scope of work maps.

January 2025

Monitoring Site Map

Figure 2

N 0 100 Feet

Notes:
1. The 2024 photo points and transects displayed in this figure were located in the field with the ESRI Collector application utilizing an EOS Arrow 100 GPS device.
2. The photo point and transect locations are based on those shown in the 2024 scope of work and figures, and photos from past monitoring reports. The photo points and transects are not physically identified on the site. Therefore, the locations were approximated.

January 2025

Transect & Photo Point Map

Figure 3

APPENDIX A: PHOTO POINTS

Appendix A

Photo Points

Exhibit A-1: Photo Point 1 Facing Northwest Along Transect 1 From Southern Point of Site

Exhibit A-2: Photo Point 2 Facing Northwest Along Transect 3 from Southern Point of Site

APPENDIX A: PHOTO POINTS

Exhibit A-3: Photo Point 3a Facing East from Center of Wetland and Toward Shore and Spit

Exhibit A-4: Photo Point 3b Facing Northwest Along Stormwater Swale from Center of Wetland and Toward Tommy Thompson Trail

APPENDIX A: PHOTO POINTS

Exhibit A-5: Photo Point 3c Facing Southeast from Center of Wetland and Toward Southern Buffer

Exhibit A-6: Photo Point 3d Facing Northeast from Center of Wetland Toward Transect 4 and 6

APPENDIX A: PHOTO POINTS

Exhibit A-7: Photo Point 4 Facing Northwest Along Stormwater Swale

Exhibit A-8: Photo Point 5 Facing Southwest Toward Center of Wetland

APPENDIX A: PHOTO POINTS

Exhibit A-9: Photo Point 6 Facing Southeast Toward End of Spit

Exhibit A-10: Photo Point 7 Facing North Along Transect 9

APPENDIX A: PHOTO POINTS

Exhibit A-11: Photo Point 8 Facing South Along Transect 8

Exhibit A-12: Photo Point 9 Facing East Toward Spit

APPENDIX A: PHOTO POINTS

Exhibit A-13: Photo Point 10 Facing North from Northern Point of Site

APPENDIX B: TRANSECT DATA

Appendix B

Transect Data

Transect 1: Buffer

Start	End	Cover (ft)	Species
2	5	3	rose
14	23	9	rose
23	42	19	cottonwood, snowberry
42	52	10	cottonwood, snowberry, salal, bigleaf maple
52	59	7	snowberry, bigleaf maple
59	68	9	bigleaf maple
68	88	20	doug fir
96	110	14	rose
110	118	8	bigleaf maple, rose
118	133	15	rose, oceanspray
133	153	20	rose
165	174	9	rose
174	181	7	snowberry
181	200	19	rose

Buffer vegetative cover	169
Length of transect	200
% cover	**84.5%**

Transect 1 Noxious Weeds

			himalayan blackberry, common
0	19	19.0	tansy
42	52	10.0	common tansy
59	68	9.0	himalayan blackberry
76	200	124.0	himalayan blackberry

Weed cover	162.0
Length of transect	200
% weed cover	**81.0%**

Transect 1 Notes:

Transect 2: Buffer

Start	End	Cover (ft)	Species
0	10.5	10.5	rose
12	21	9	oceanspray, rose
21	27.5	6.5	rose
29	35	6	rose
35	40.5	5.5	oceanspray
41	42	1	snowberry
42	46	4	rose
46	61	15	rose, snowberry
61	70	9	oceanspray
71.5	76.5	5	snowberry
78	83	5	snowberry
86	143.5	57.5	snowberry
150.5	156	5.5	snowberry
156	160	4	snowberry, rose
160	185	25	rose, yarrow
185	191	6	dunegrass, beach bur

Buffer vegetative cover	174.5	
Length of transect	191	
Transect length minus monitoring well	189.5	*Monitoring well clearing from 10.5' to 12'.*
% cover	**92.1%**	

Transect 2 Noxious Weeds

84	96.5	12.5	common tansy
146	147	1	common tansy
148	150.5	2.5	common tansy

Weed cover	16
Length of transect	189.5
% weed cover	**8.4%**

Transect 2 Notes:

Transect 3: Buffer

Start	*End*	*Cover (ft)*	*Species*
0	7	7	saltbush, dunegrass
7	71	64	dunegrass, small bedstraw, saltbush
71	76	5	small bedstraw, dunegrass
76	90	14	dunegrass
90	94	4	small bedstraw
94	100	6	dunegrass

Buffer vegetative cover	100
Length of transect	100
% cover	**100.0%**

Transect 3 Noxious Weeds

0	7	7.0	Queen Anne's lace

Weed cover	7.0
Length of transect	100
% weed cover	**7.0%**

Transect 3 Notes: Bentgrass (Agrostis sp.) present from 0' to 7'. Trace curly dock (Rumex crispus) from 7' to 71'.

Transect 4: Buffer

Start	*End*	*Cover (ft)*	*Species*
0	7	7	dunegrass
7	54	47	dunegrass
54	55.5	1.5	dunegrass, saltbush
55.5	68	12.5	dunegrass
68	92.5	24.5	dunegrass, saltbush
92.5	99	6.5	beach bur, dunegrass
99	100	1	dunegrass

Buffer vegetative cover	100
Length of transect	100
% cover	**100.0%**

Transect 4 Noxious Weeds

92.5	99	6.5	sow thistle

Weed cover	6.5
Length of transect	100
% weed cover	**7%**

Transect 4 Notes: Trace curly dock and small bedstraw from 7' to 92.5'. Quackgrass (Elymus repens) present from 7' to 28'.

Transect 5: Wetland Emergent

Start	End	Cover (ft)	Species
0	6	6	pickleweed, saltgrass
6	15	9	pickleweed
15	23	8	pickleweed, saltgrass, saltbush
23	24.5	1.5	arrowgrass, saltgrass
24.5	31.5	7	saltgrass
31.5	34	2.5	saltgrass, pickleweed
34	42	8	saltgrass
42	43	1	saltgrass, pickleweed
43	59	16	saltgrass
59	60	1	saltgrass, saltmarsh bulrush
60	72	12	saltgrass
72	76	4	spikerush, saltgrass
76	85	9	arrowgrass, Baltic rush
85	100	15	saltgrass, saltbush, pickleweed

Wetland Emergent cover	100
Length of transect	100
% cover	**100.0%**

Transect 5 Noxious Weeds

Weed cover	0
Length of transect	100
% weed cover	**0.0%**

Transect 5 Notes:

Transect 6: Wetland Emergent

Start	End	Cover (ft)	Species
0	16.5	16.5	Baltic rush, saltgrass
16.5	26	9.5	pickleweed, saltgrass
26	32	6	Baltic rush
32	49	17	saltgrass, saltbush, pickleweed
49	94.5	45.5	saltgrass, pickleweed
94.5	99	4.5	saltgrass, saltbush, pickleweed

Wetland Emergent cover	99
Length of transect	100
% cover	**99.0%**

Transect 6 Noxious Weeds

Weed cover	0
Length of transect	100
% weed cover	**0.0%**

Transect 6 Notes:

Transect 7: Wetland Emergent

Start	*End*	*Cover (ft)*	*Species*
0	28	28	saltbush
50	51	1	saltbush
53	72	19	saltbush

Wetland Emergent cover	48
Length of transect	75
% cover	**64.0%**

Transect 7 Noxious Weeds

51	53	2.0	hedge bindweed

Weed cover	2.0
Length of transect	75
% weed cover	**2.7%**

Transect 7 Notes: Hedge bindweed growing adjacent to transect line. Bentgrass (Agrostis sp.) present from 0' to 75'.

Transect 8: Buffer*

Start	*End*	*Cover (ft)*	*Species*
12.5	15	2.5	sea-rocket
18.5	20.3	1.8	saltbush
21.5	23	1.5	saltbush
25	26	1	saltbush
37	37.2	0.2	saltgrass
43	43.2	0.2	saltgrass
75.3	80.2	4.9	beach bur
87.5	98.5	11	beach sandspurry
98.5	100	1.5	saltbush

Buffer vegetative cover	24.6
Length of transect	100
% cover	**24.6%**

Transect 8 Noxious Weeds

Weed cover	0
Length of transect	100
% weed cover	**0%**

Transect 8 Notes: *Transect crosses both wetland emergent and buffer area, but a majority of the area (~85%) is within buffer.

Trace sea plantain (Plantago maritima) from 87.5' to 98.5'.

Transect 9: Buffer

Start	End	Cover (ft)	Species
0	0.8	0.8	saltbush
1.6	1.8	0.2	saltbush
4.6	5.5	0.9	gumweed, seabush
6.2	6.8	0.6	saltbush
8.5	19.5	11	beach bur
21.2	21.6	0.4	beach bur
22.5	31.9	9.4	beach bur
31.9	41	9.1	dunegrass, sea-rocket
47	48.5	1.5	beach bur
50	51.5	1.5	beach bur
54.5	76.5	22	beach bur
76.5	77.5	1	sea-rocket
79	97	18	dunegrass, beach bur

Buffer vegetative cover	76.4
Length of transect	100
% cover	**76.4%**

Transect 9 Noxious Weeds

Weed cover	0
Length of transect	100
% weed cover	**0.0%**

Transect 9 Notes:

Aggregate Wetland Emergent Transect Data

Wetland Emergent Cover	247.00
Length of transect	275
% Wetland Emergent Cover	**89.8%**
Noxious vegetative cover	2.00
Length of transect	275
Percent Noxious Cover	**0.7%**

Aggregate Buffer Transect Data

Buffer vegetative cover	644.50
Length of transect	789.5
% Buffer Vegetative Cover	**81.6%**
Noxious vegetative cover	191.50
Length of transect	789.5
Percent Noxious Cover	**24.3%**

IMPORTANT INFORMATION

Important Information

About Your Wetland Delineation/Mitigation and/or Stream Classification Report

IMPORTANT INFORMATION

A WETLAND/STREAM REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Wetland delineation/mitigation and stream classification reports are based on a unique set of project specific factors. These typically include the general nature of the project and property involved, its size and configuration, historical use and practice, the location of the project on the site and its orientation, and the level of additional risk the client assumed by virtue of limitations imposed upon the exploratory program. The jurisdiction of any particular wetland/stream is determined by the regulatory authority(ies) issuing the permit(s). As a result, one or more agencies will have jurisdiction over a particular wetland or stream with sometimes confusing regulations. It is necessary to involve a consultant who understands which agency(ies) has jurisdiction over a particular wetland/stream and what the agency(ies) permitting requirements are for that wetland/stream. To help reduce or avoid potential costly problems, have the consultant determine how any factors or regulations (which can change subsequent to the report) may affect the recommendations.

Unless your consultant indicates otherwise, your report should not be used:

- If the size or configuration of the proposed project is altered.
- If the location or orientation of the proposed project is modified.
- If there is a change of ownership.
- For application to an adjacent site.
- For construction at an adjacent site or on site.
- Following floods, earthquakes, or other acts of nature.

Wetland/stream consultants cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed. Therefore, it is incumbent upon you to notify your consultant of any factors that may have changed prior to submission of our final report.

Wetland boundaries identified and stream classifications made by Shannon & Wilson are considered preliminary until validated by the U.S. Army Corps of Engineers (Corps) and/or the local jurisdictional agency. Validation by the regulating agency(ies) provides a certification, usually written, that the wetland boundaries verified are the boundaries that will be regulated by the agency(ies) until a specified date, or until the regulations are modified, and that the stream has been properly classified. Only the regulating agency(ies) can provide this certification.

MOST WETLAND/STREAM "FINDINGS" ARE PROFESSIONAL ESTIMATES.

Site exploration identifies wetland/stream conditions at only those points where samples are taken and when they are taken, but the physical means of obtaining data preclude the determination of precise conditions. Consequently, the information obtained is intended to

IMPORTANT INFORMATION

be sufficiently accurate for design but is subject to interpretation. Additionally, data derived through sampling and subsequent laboratory testing are extrapolated by the consultant who then renders an opinion about overall conditions, the likely reaction to proposed construction activity, and/or appropriate design. Even under optimal circumstances, actual conditions may differ from those thought to exist because no consultant, no matter how qualified, and no exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock, and time. Nothing can be done to prevent the unanticipated, but steps can be taken to help reduce their impacts. For this reason, most experienced owners retain their consultants through the construction or wetland mitigation/stream classification stage to identify variances, conduct additional evaluations that may be needed, and recommend solutions to problems encountered on site.

WETLAND/STREAM CONDITIONS CAN CHANGE.

Since natural systems are dynamic systems affected by both natural processes and human activities, changes in wetland boundaries and stream conditions may be expected. Therefore, delineated wetland boundaries and stream classifications cannot remain valid for an indefinite period of time. The Corps typically recognizes the validity of wetland delineations for a period of five years after completion. Some city and county agencies recognize the validity of wetland delineations for a period of two years. If a period of years has passed since the wetland/stream report was completed, the owner is advised to have the consultant reexamine the wetland/stream to determine if the classification is still accurate.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or water fluctuations may also affect conditions and, thus, the continuing adequacy of the wetland/stream report. The consultant should be kept apprised of any such events and consulted to determine if additional evaluation is necessary.

THE WETLAND/STREAM REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when plans are developed based on misinterpretation of a wetland/stream report. To help avoid these problems, the consultant should be retained to work with other appropriate professionals to explain relevant wetland, stream, geological, and other findings, and to review the adequacy of plans and specifications relative to these issues.

DATA FORMS SHOULD NOT BE SEPARATED FROM THE REPORT.

Final data forms are developed by the consultant based on interpretation of field sheets (assembled by site personnel) and laboratory evaluation of field samples. Only final data forms are customarily included in a report. These data forms should not, under any circumstances, be drawn for inclusion in other drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates

IMPORTANT INFORMATION

this problem, it does nothing to reduce the possibility of misinterpreting the forms. When this occurs, delays, disputes, and unanticipated costs are frequently the result.

To reduce the likelihood of data from misinterpretation, contractors, engineers, and planners should be given ready access to the complete report. Those who do not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of information always insulates them from attendant liability. Providing the best available information to contractors, engineers, and planners helps prevent costly problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because a wetland delineation/stream classification is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in written transmittals. These are not exculpatory clauses designed to foist the consultant's liabilities onto someone else; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

THERE MAY BE OTHER STEPS YOU CAN TAKE TO REDUCE RISK.

Your consultant will be pleased to discuss other techniques or designs that can be employed to mitigate the risk of delays and to provide a variety of alternatives that may be beneficial to your project.

The preceding paragraphs are based on information provided by the Geoprofessional Business Association (https://www.geoprofessional.org)