GEORGIA PACIFIC MILL SITE OU-E MITIGATION MONITORING

Year 5 Report

Prepared for
Kennedy/Jenks

January 2023

Final

GEORGIA PACIFIC MILL SITE OU-E MITIGATION MONITORING

Year 5 Report

Prepared for
Kennedy/Jenks

January 2023

2600 Capitol Avenue
Suite 200
Sacramento, CA 95816
916.564.4500
www.esassoc.com

ESA

Atlanta	Orlando	San Diego
Bend	Palm Beach County	San Francisco
Camarillo	Pasadena	San Jose
Irvine	Pensacola	Sarasota
Los Angeles	Petaluma	Seattle
Mobile	Portland	Tampa
Oakland	Sacramento	

201700229.06

OUR COMMITMENT TO SUSTAINABILITY | ESA helps a variety of public and private sector clients plan and prepare for climate change and emerging regulations that limit GHG emissions. ESA is a registered assessor with the California Climate Action Registry, a Climate Leader, and founding reporter for the Climate Registry. ESA is also a corporate member of the U.S. Green Building Council and the Business Council on Climate Change (BC3). Internally, ESA has adopted a Sustainability Vision and Policy Statement and a plan to reduce waste and energy within our operations. This document was produced using recycled paper.

TABLE OF CONTENTS

Georgia Pacific Mill Site OU-E Mitigation Monitoring Year 5 Report

Page

Section 1, Introduction 1-1
- 1.1 Purpose and Goals 1-1
- 1.2 Project Overview 1-3
  - 1.2.1 Project Permits and Authorizations 1-3
  - 1.2.2 Pre-Project Conditions, Impacts, and Mitigation Sites 1-3
    - OU-E Lowlands 1-9
    - South Ponds (Ponds 2 and 3) 1-10
    - Upland Riparian Habitat (Riparian Areas 1-4) 1-11
- 1.3 Success Criteria 1-11
- 1.4 Responsible Parties 1-13
  - 1.4.1 Report Preparation 1-13

Section 2, Revegetation Monitoring 2-1
- 2.1 Site Revegetation 2-1
- 2.2 Monitoring Methods and Schedule 2-1
  - 2.2.1 Species Richness 2-2
  - 2.2.2 Vegetative Cover 2-2
  - 2.2.3 Hydrology Indicators Assessment 2-3
    - Wetland E-1 and Wetland Establishment Area 2-3
    - Pond 3 2-3
  - 2.2.4 Delineated Acreage of Wetland (Year 5 Only) 2-3
  - 2.2.5 Depth to Groundwater 2-3
  - 2.2.6 Flow Unimpeded, Channel Banks Stable (Wetland L) 2-4
  - 2.2.7 Photo Documentation 2-4

Section 3, Monitoring Results 3-1
- 3.1 OU-E Lowlands 3-1
  - 3.1.1 Wetland E-1 3-1
    - Species Richness 3-2
    - Vegetation Percent Cover 3-3
    - Wetland Hydrology Indicators 3-3
- 3.2 South Ponds 3-4
  - 3.2.1 Pond 3 3-4
    - Species Richness 3-5
    - Vegetation Percent Cover 3-5
    - Ponded Water Hydrology Indicators 3-6
- 3.3 Seasonal Wetland Ditch (Wetland L) and Riparian Areas 3-7
  - 3.3.1 RAA-2 3-7
    - Vegetation Percent Cover 3-7
    - Flow Unimpeded, Channel Banks Stable (Wetland L) 3-7

Page

3.3.2 RAA-4 3-8
Vegetation Percent Cover 3-9
Flow Unimpeded, Channel Banks Stable (Wetland L) 3-10
3.4 Wetland Establishment Area – Delineated Wetland Acreage 3-10

Section 4, Conclusions and Recommendations 4-1
4.1 Conclusions 4-1
4.2 Future Actions 4-1

Section 5, References 5-1

List of Figures

Figure 1 Project Location 2
Figure 2 Operable Unit-E Mitigation Monitoring Sites 4
Figure 3 Operable Unit-E Mitigation Monitoring Sites 5
Figure 4 Operable Unit-E Mitigation Monitoring Sites 6
Figure 5 Operable Unit-E Mitigation Monitoring Sites 7
Figure 6 Operable Unit-E Mitigation Monitoring Sites 8

List of Tables

Table 1-1 Mitigation Site Performance Standards and Annual Success Criteria 12
Table 2-1 Seed Mixes 1
Table 2-2 Vegetative Cover Monitoring Transects 5
Table 3-1 Wetland E-1 Performance in Year 5 2
Table 3-2 Native Wetland Plant Species Recorded at Wetland E-1 Transects in Year 5 2
Table 3-3 Wetland E-1 Vegetative Percent Cover by Species in Year 5 4
Table 3-4 Pond 3 Performance in Year 5 5
Table 3-5 Native Wetland Plant Species Recorded at Pond 3 Transects in Year 5 5
Table 3-6 Pond 3 Vegetative Percent Cover by Species in Year 5 6
Table 3-7 RAA-2 Performance in Year 5 7
Table 3-8 RAA-2 Vegetative Percent Cover by Species in Year 5 8
Table 3-9 RAA-4 Performance in Year 5 9
Table 3-10 RAA-4 Vegetative Percent Cover by Species in Year 5 9
Table 4-1 Mitigation Site Performance Against Annual Success Criteria in 2018, 2019,2021 and 2022 2

Appendices

Appendix A Memorandum: Proposal to revise performance standards for mitigation sites within the Georgia-Pacific Mill Site Operable Unit E in Fort Bragg, California. A-1
Appendix B Aquatic Resources Delineation B-1
Appendix C Photo Documentation C-1

SECTION 1
Introduction

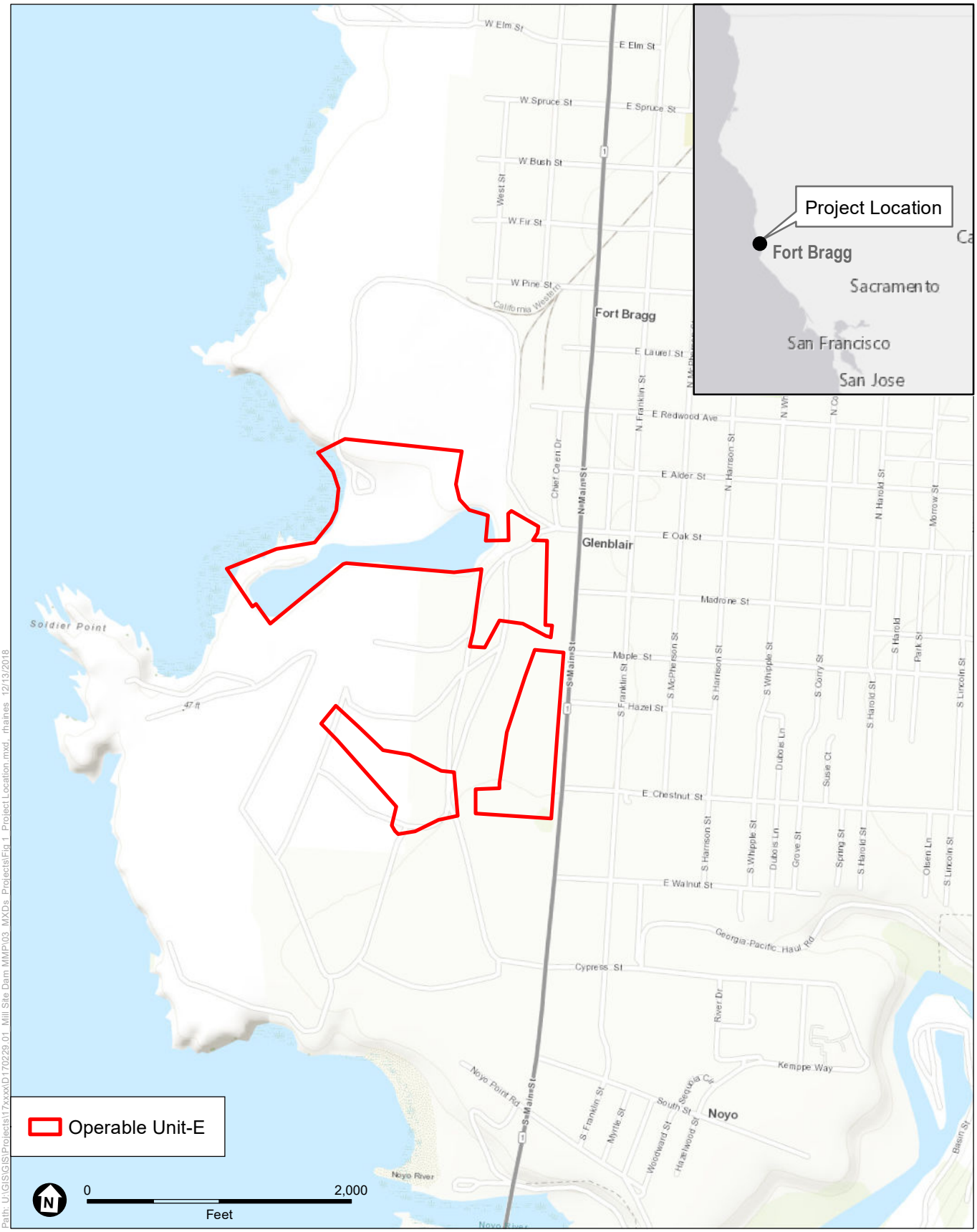
1.1 Purpose and Goals

Environmental Science Associates (ESA) conducted the fifth year of mitigation monitoring at the Operable Unit E (OU-E) mitigation sites at the former Georgia-Pacific, LLC, Fort Bragg Wood Products Facility located at 90 Redwood Avenue in Fort Bragg, California in 2022 (**Figure 1**). This work was conducted on behalf of Kennedy/Jenks Consultants, Inc. (Kennedy/Jenks), and for Mendocino Railway, who acquired the property from Georgia-Pacific, LLC in 2021.

The purposes of the mitigation are to: 1) restore in-kind and in-place 0.064-acre of temporarily impacted waters of the United States (0.056-acre of wetlands and 0.008-acre of stream); 0.476-acre of waters of the State (which includes the 0.064-acre impacts to waters of the U.S.); and 0.020-acre of upland riparian habitat disturbed by OU-E Soil and Sediment Removal Action (OU-E Removal Action or project) activities to pre-remediation conditions; and, 2) to establish an additional 0.548 acres of seasonal wetland/seep wetland habitat (wetland establishment area [WEA]) in the OU-E Lowlands around the existing wetland E-6 and with a similar function to E-6. The WEA is intended to form a larger, interconnected wetland area encompassing the existing wetland E-6 and nearby Ponds 6 and 7.

Restoration of wetlands and riparian habitat and creation of the wetland establishment area was implemented in accordance with the *Operable Unit E Mitigation and Monitoring Plan* (Arcadis 2016b; MMP) and as described in the *Wetland Establishment Area Annual Report and As-Built Conditions for Georgia-Pacific Fort Bragg Mill Site* (Kennedy/Jenks 2018). The goal of the monitoring program is to confirm that implementation of the wetland and riparian habitat restoration and WEA creation compensates for temporary project impacts.

This report documents the 2022 (Year 5) monitoring results of the four sites that did not meet their Year 5 success criteria in 2021 (Year 4). Section 1 includes a description of the project actions and success criteria; Section 2 discusses restoration and monitoring methods and schedule; Section 3 presents 2022 monitoring results; and Section 4 presents conclusions and recommendations for the OU-E Lowlands mitigation sites.



SOURCE: ESA, 2018

Georgia Pacific Mill Site OU-E Mitigation Monitoring . 170229.01

Figure 1
Project Location

ESA

1.2 Project Overview

The Department of Toxic Substance Control issued an Investigation and Remediation Order (Docket No. HAS-RAO-06-07-150) to Georgia-Pacific, LLC (effective on February 21, 2007), which required remediation of soils and sediments within the former Fort Bragg Wood Products Facility Operable Unit E. The OU-E Soil and Sediment Removal Action was widespread within the unit and included several sites located in wetlands and upland riparian habitat. Remediation consisted of ground disturbance and excavation of soil and sediment in September and October 2017. Excavated areas were backfilled with imported clean soils and those locations which required restoration planting or hydroseeding (i.e., impacted wetlands and upland riparian habitat included in this report) were completed in November and December 2017 (Arcadis 2016b; Kennedy/Jenks 2018).

1.2.1 Project Permits and Authorizations

The OU-E Soil and Sediment Removal Action (project) resulted in the temporary impact to 0.064-acre waters of the United States, 0.476-acre of waters of the State, and 0.020-acre of upland riparian habitat. These impacts were authorized by the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), and California Coastal Commission (CCC), hereinafter the Resource Agencies. No permanent impacts to wetlands or other waters under the jurisdiction of the Resource Agencies resulted from project implementation of remediation actions.

U.S. Army Corps of Engineers

The USACE issued an order for the project (No. 2009-00372N) on August 29, 2017.

Regional Water Quality Control Board

The North Coast RWQCB issued a Water Quality Certification for the project (No. 1B16655WNME) on September 14, 2016.

California Department of Fish and Wildlife

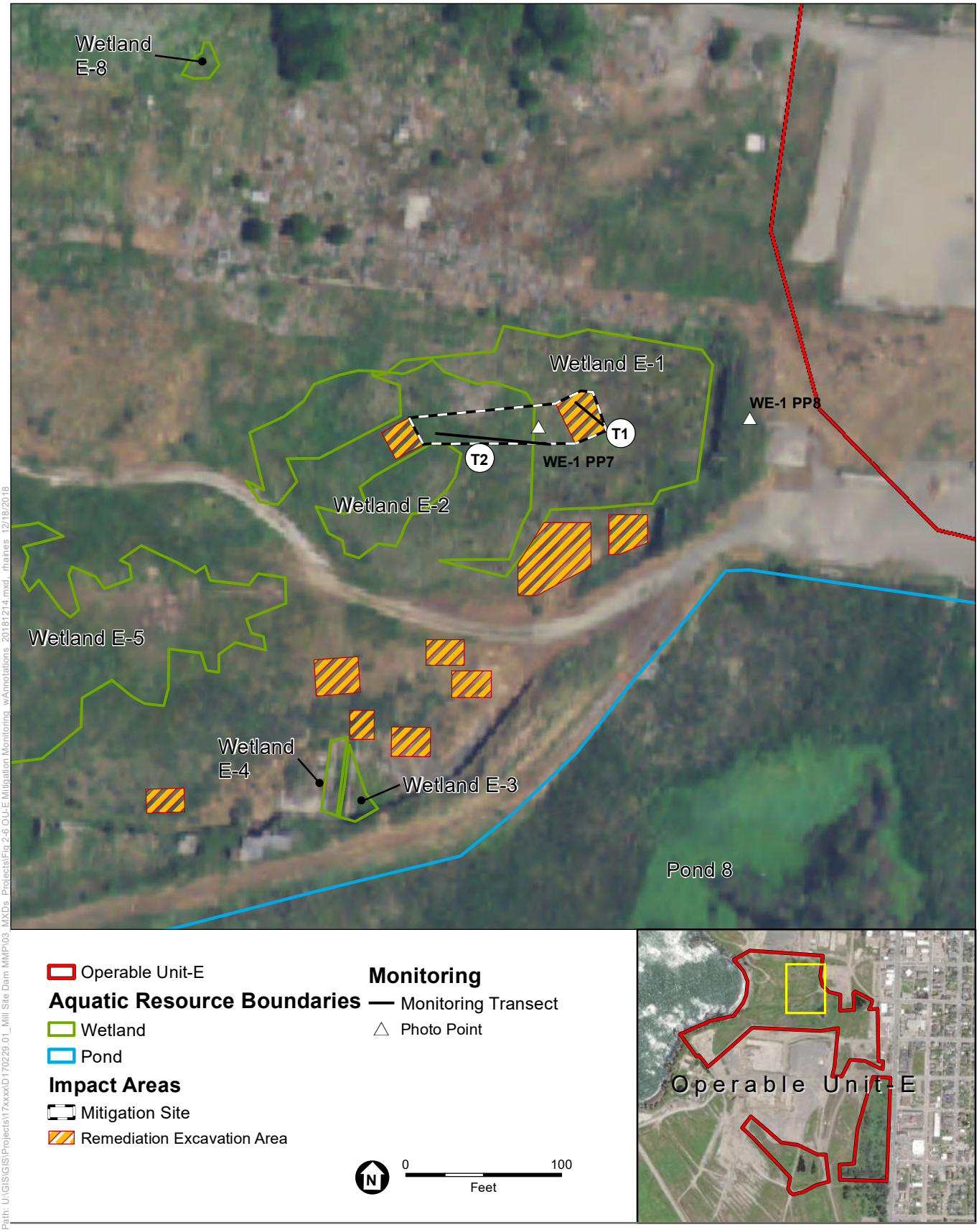
The CDFW issued a Streambed Alteration Agreement for the project (Notification No. 1600-2016-265-R1) on August 26, 2016.

California Coastal Commission

The CCC issued a Coastal Development Permit for the project (CDP 03-16) on August 10, 2016.

1.2.2 Pre-Project Conditions, Impacts, and Mitigation Sites

Remedial action excavation impact areas, mitigation sites (i.e., wetland and upland riparian restoration sites and the created wetland establishment area), transect locations, photo points, and groundwater monitoring well locations are depicted on **Figures 2 through 6**. The following section provides a summary of mitigation site conditions prior to project implementation, remedial action conducted at each mitigation site, and how the sites were revegetated.



Path: U:\GIS\GIS\Projects\17xxxx\D170229.01_Mill Site Dam MMP\03_MXDs_Projects\Fig 2-6 OU-E Mitigation Monitoring_wAnnotations_20181214.mxd rhaines 12/18/2018

SOURCE: Kennedy/Jenks 7.25.18; ESA, 2018

Georgia Pacific Mill Site OU-E Mitigation Monitoring . 170229.01

Figure 2 of 6
Operable Unit-E Mitigation Monitoring Sites

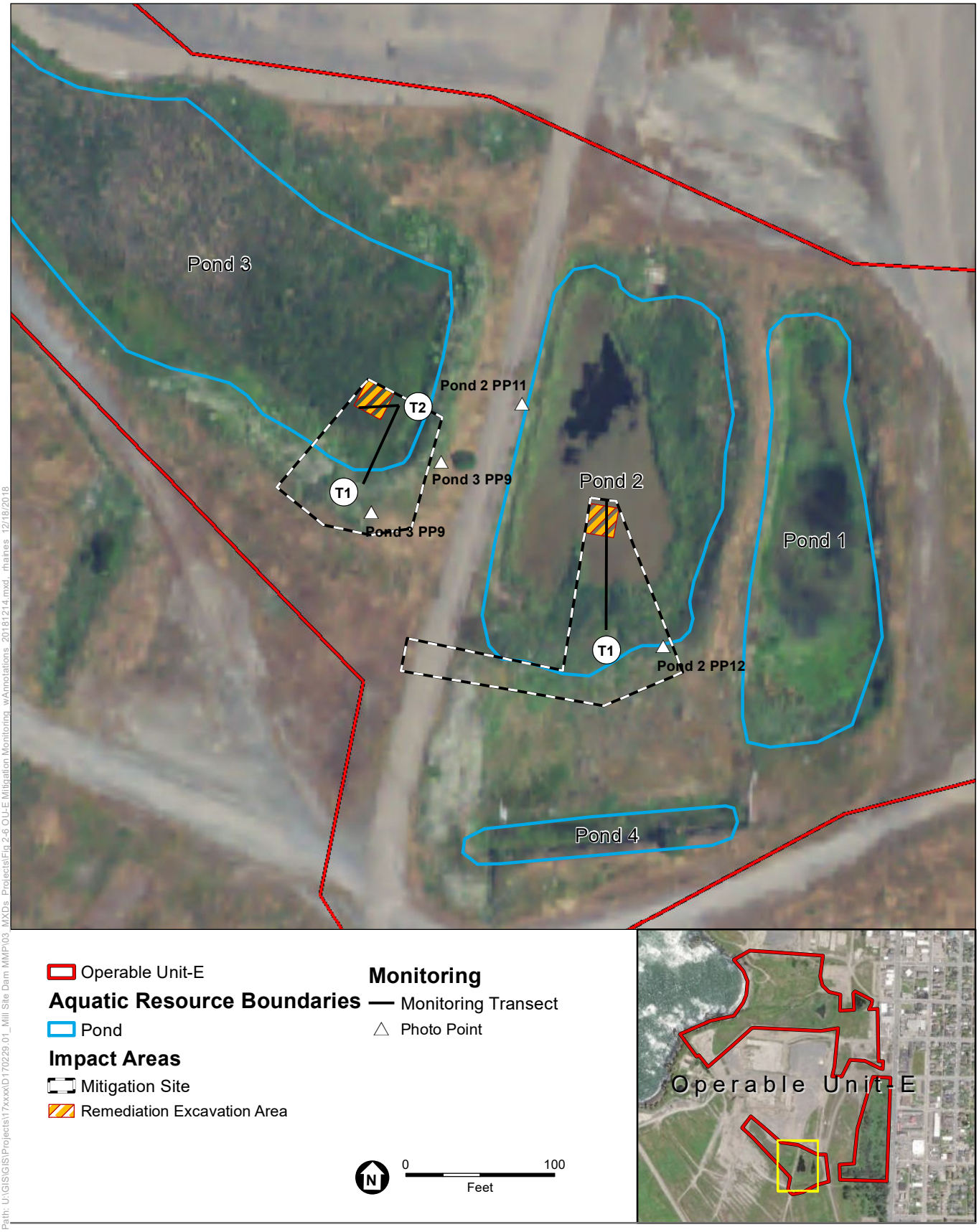
ESA

SOURCE: Kennedy/Jenks 7.25.18; ESA, 2018

Georgia Pacific Mill Site OU-E Mitigation Monitoring . 170229.01

Figure 3 of 6
Operable Unit-E Mitigation Monitoring Sites

ESA



Path: U:\GIS\GIS\Projects\17xxxx\D170229.01_Mill Site Dam MMP\03_MXDs_Projects\Fig 2-6 OU-E Mitigation Monitoring_wAnnotations_20181214.mxd rhaines 12/18/2018

SOURCE: Kennedy/Jenks 7.25.18; ESA, 2018

Georgia Pacific Mill Site OU-E Mitigation Monitoring . 170229.01

Figure 4 of 6
Operable Unit-E Mitigation Monitoring Sites

ESA

Path: U:\GIS\GIS\Projects\17xxxx\D170229.01_Mill Site Dam MMP\03_MXDs_Projects\Fig 2-6 OU-E Mitigation Monitoring_wAnnotations_20181214.mxd rhaines 12/18/2018

SOURCE: Kennedy/Jenks 7.25.18; ESA, 2018

Georgia Pacific Mill Site OU-E Mitigation Monitoring . 170229.01

Figure 5 of 6
Operable Unit-E Mitigation Monitoring Sites

ESA

SOURCE: Kennedy/Jenks 7.25.18; ESA, 2018

Georgia Pacific Mill Site OU-E Mitigation Monitoring . 170229.01

Figure 6 of 6
Operable Unit-E Mitigation Monitoring Sites

ESA

A description of mitigation sites as assessed prior to project implementation is included to provide context for annual performance against success criteria. This information is sourced from the MMP and its Appendix A: California Rapid Assessment Method Data (Arcadis 2016b). The pre-project assessments utilized the California Rapid Assessment Method (CRAM) for the OU-E Lowlands (Wetland E-1, Wetland E-6 and the WEA, and Pond 7) and the South Ponds (Pond 2 and Pond 3) to document their function prior to disturbance. Results of the CRAM assessment found these aquatic features to demonstrate limited functional capacity in their previous condition due to a combination of some or all of the following reasons:

1) low species diversity (richness) within the plant community (Wetland E-1, Wetland E-6/ WEA, Ponds 2 and 3);

2) lack of hydrologic connectivity (Ponds 2, 3, and 7); and

3) that features' buffered conditions and physical structure(s) were limited by historical and surrounding development (all features assessed).

The CRAM assessment also identified dominant species at each site within the short, medium, and tall plant layers, whether the species was native[1] or invasive, and quantified the percentage of dominant species which were invasive; this information is provided below for each mitigation site assessed.

OU-E Lowlands

The OU-E Lowlands is a subunit of Operable Unit-E which includes the mitigation sites Wetland E-1, the wetland establishment area, and Pond 7.

Wetland E-1 (RAA-T1)

Wetland E-1 is an existing seep wetland located in the northeast corner of the OU-E Lowlands (Figure 2). Prior to construction, the CRAM assessment documented nine co-dominant species which included the following five native species: Bolander's rush (*Juncus bolanderi*), tufted hair grass (*Deschampsia cespitosa*), tall flat sedge (*Cyperus eragrostis*), common bog rush (*Juncus effusus*), and broadleaf cattail (*Typha latifolia*). Invasive annual rabbit's foot grass (*Polypogon monspeliensis*) and Andean pampas grass (*Cortaderia jubata*) were estimated to comprise 22 percent of the codominant species at this site. During construction, a corridor was created through the western edge of Wetland E-1 to access the excavation area where approximately 194 CY of soil was removed. The excavated area was then backfilled within one foot of the pre-existing grade using imported, naturally-sourced pea-gravel. Excess soil generated from grading the wetland establishment area (WEA) to the north (Figure 2) was used to finish filling the Wetland E-1 excavation area to the pre-existing grade. The temporary access corridor (route) and the excavation area were seeded with the Wet Meadow seed mix (tall flat sedge [*Cyperus eragrostis*], creeping wild rye [*Elymus triticoides*], and meadow barley [*Hordeum brachyantherum*]; Table 2-1 in Section 2, Revegetation Monitoring) on December 19, 2017.

[1] Non-native species not considered to be invasive were included in the "native" category for the CRAM assessment.

Wetland E-6 and Wetland Establishment Area (WEA)

Wetland E-6 is an existing seasonal wetland within the OU-E Lowlands, around which the 1.25 acres of emergent seep/seasonal wetland (WEA) was created as compensation for temporary project impacts to waters of the U.S. and State (Figure 3). Prior to construction, the area that would become the WEA was identified as Wetland E-6 and Wetland E-5. The CRAM assessment documented eight co-dominant species, four of which were native[2] or non-native, non-invasive species: tall flat sedge, tufted hair grass, bird's foot trefoil (*Lotus corniculatus*), and cut leaf plantain (*Plantago coronopus*). Invasive brass buttons (*Cotula coronopifolia*), common velvet grass (*Holcus lanatus*), and pampas grass (*Cortaderia selloana*) were estimated to comprise 38 percent of the co-dominant species at this site. To create the WEA, the existing ground surfaces in the areas north, west, and east of wetland E-6 and north of Pond 7 were graded to lower the ground surface elevation by approximately 12-18 inches and bring the new ground surface elevation within approximately 12 inches of groundwater. A berm was constructed near the southern edge of the WEA north of Pond 7, at the east end of the pond and approximately 20 feet north at the west end. Once grading was complete, locally collected seeds were hand scattered in the disturbed area, live plants were planted, and the Wet Meadow hydroseed mix (tall flat sedge, creeping wild rye, and meadow barley; see Table 2-1) was applied.

Ponded Wetland (Pond 7)

Pond 7 is located in the southwest corner of the OU-E Lowlands (Figure 2) and formerly served as an ash dewatering pond during mill operations. Prior to construction, Pond 7 consisted of open, ponded water bordered by emergent wetlands. The CRAM assessment identified three co-dominant species within the emergent wetlands, all of which were native: floating marsh penny wart (*Hydrocotyle ranunculoides*), water parsley (*Oenanthe sarmentosa*), and broadleaf cattail. During construction, existing vegetation was removed to allow access for excavation of approximately 375 CY of sediment from the pond floor. The excavated sediment was replaced with excess soil generated from the grading of the adjacent WEA. The northern bank was reshaped, causing Pond 7 to extend beyond the wooden retaining wall that previously formed its northern bank. Pond 7 was hydroseeded with the Ponded Wetland seed mix (common bog rush and broadleaf cattail; see Table 2-1).

South Ponds (Ponds 2 and 3)

Ponds 2 and 3 are located at the south end of the OU-E project site (Figure 4). Prior to construction, the CRAM assessment documented three co-dominant species in Pond 2 including native broadleaf cattail, non-native, non-invasive sea rocket (*Cakile edentula*), and invasive parrot feather watermilfoil (*Myriophyllum aquaticum*; 33 percent of the co-dominant species). Co-dominant species identified during the CRAM assessment in Pond 3 consisted of the following five native species: slough sedge (*Carex obnupta*), common bog rush, smaller duck weed (*Lemna minor*), mountain bog bulrush (*Scirpus microcarpus*), and broadleaf cattail. Approximately 15 CY of sediment was removed from Pond 2 and 30 CY of sediment was removed from Pond 3. As Pond 3 was vegetated, the vegetative mat was removed and set aside prior to excavation.

[2] As the CRAM assessment only differentiated native and invasive species, non-native but non-invasive species bird's foot trefoil and cut leaf plantain were included in the native species category.

Temporary earthen ramps were constructed into each pond by re-sloping the existing banks to allow equipment access. Bank slopes were reshaped following excavation to pre-existing conditions and the vegetated mat replaced in Pond 3 to allow for plant reestablishment. Disturbed areas access and excavation areas at Ponds 2 and 3 were hydroseeded with the Ponded Wetland seed mix (common bog rush and broadleaf cattail; see Table 2-1) on December 19, 2017.

Upland Riparian Habitat (Riparian Areas 1-4)

The seasonal wetland ditch identified as Wetland L in the MMP is surrounded by an upland riparian corridor; both the ditch and riparian corridor are located along the east boundary of the OU-E project site (Figure 5 and 6). A CRAM assessment was not performed for these four sites and the presence of invasive species prior to project implementation is not quantified in the MMP. Wetland L is described as containing little to no vegetation within the channel but with hydrophytic vegetation growing on adjacent banks prior to project implementation. Native species including California blackberry (*Rubus ursinus*), California wax myrtle (*Myrica californica*), red alder (*Alnus rubra*), red elderberry (*Sambucus racemosa*), and various willows (*Salix* ssp.) were documented on the channel banks. Each of the four riparian sites are described as containing different vegetation prior to project implementation: RAA-1 and RAA-3 contained a variety of tree and shrub species such as native red alder, willow, lodge pole pine (*Pinus contorta*), and cypress (*Hesperocyparis* sp.), among others; RAA-2 consisted of lodge pole pine trees with little herbaceous understory; and RAA-4 contained red elderberry with native California blackberry and invasive English ivy (*Hedera helix*) as dominating the understory. A total of 7 CY of sediment was removed from this feature during remediation; 1.5 to 2 CY from each of the four locations. Each riparian excavation area was backfilled to pre-existing grade with imported, naturally sourced pea gravel to control erosion. The excavation areas and equipment access routes were seeded with the Riparian Forest seed mix (see Table 2-1) on December 19, 2017.

1.3 Success Criteria

The OU-E restoration site mitigation success criteria reflect the expected rate of restoration progress to achieve a 5-year target of functional, self-sustaining ecosystems (Arcadis 2016b). Each of the mitigation sites are different in their form, function, establishment characteristics, and habitat qualities; thus, unique success criteria were set for each site. **Table 1-1** depicts the performance standards and success criteria by year for each of the OU-E mitigation sites included in the MMP and discussed in this report.

In response to observations and quantitative monitoring data collected of the nine OU-E mitigation sites over two years (2018 and 2019), modifications to the MMP performance standards and success criteria were made to better reflect the unavoidable influence from the lands surrounding the mitigation sites. These modifications were agreed to by the RWQCB following a March 22, 2021 regulatory agency meeting and are documented in the memorandum, *Proposal to revise performance standards for mitigation sites within the Georgia-Pacific Mill Site Operable Unit E in Fort Bragg, California* (ESA 2021; **Appendix A**). The memorandum was revised to incorporate clarifications requested by the RWQCB and to document the agencies' concurrence on approach described therein. Modifications to the performance standards are depicted in Table 1-1 in **bold underline** (for additions) and ~~strikethrough~~ (for deletions).

TABLE 1-1
MITIGATION SITE PERFORMANCE STANDARDS AND ANNUAL SUCCESS CRITERIA

Mitigation Sites	Performance Standard	Success Criteria by Monitoring Year				
		Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	Year 4 (2021)	Year 5 (2022)
OU-E Lowlands						
Seep Wetland (Wetland E-1, RAA-T1)	Native wet meadow plant species richness	1	2	3	5	6
	Native**/non-native/naturalized** vegetation percent cover	5	20	40	60	70
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
	Wetland hydrology indictors present[2]	Y	Y	Y	Y	Y
Seasonal/Seep Wetland (Wetland E-6 and Establishment Area)	Native wet meadow plant species richness	1	2	3	4	4
	Native**/non-native/naturalized** vegetation percent cover	15	30	40	50	60
	Invasive vegetation percent cover[3]	<5	<5	<5	<5	<5
	Depth to groundwater (inches)	<12	<12	<12	<12	<12
	Wetland hydrology indictors present	Y	Y	Y	Y	Y
	Delineated acreage of wetland[4]	--	--	--	--	0.54
Ponded Wetlands (Pond 7)	Native wetland plant species richness	0	1	1	3	3
	Native vegetation percent cover	5	25	50	75	80
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
	Ponded water indicators present	Y	Y	Y	Y	Y
South Ponds						
Ponded Wetlands (Ponds 2 and 3)	Native wetland plant species richness	1	2	3	4	4
	~~Emergent[5]~~ **N**ative**/non-native/naturalized[5]** vegetation percent cover[6]	5	25	50	75	80
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
	Ponded water indicators present	Y	Y	Y	Y	Y
Riparian Areas						
Seasonal Wetland Ditch (Wetland L)	Flow unimpeded, channel and bank stable	Y	Y	Y	Y	Y
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
Upland Riparian Habitat (RAA-1, RAA-2, RAA-3, RAA-4)	Native**/non-native/naturalized** vegetation percent cover	5	20	40	60	70
	~~Planted native tree/shrub percent survival[7]~~	~~100~~	~~90~~	~~85~~	~~85~~	~~85~~
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5

NOTES:

1 Target invasive species are pampas grass (*Cortaderia* sp.), English ivy (*Hedera helix*), iceplant (*Carpobrotus edulis*), and Himalayan blackberry (*Rubus armeniacus*).
2 Document the presence of primary and secondary wetland hydrology indicators as provided in the USACE Regional Supplement to the Corps of Engineers Wetland Delineation manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010)
3 Target invasive species for Wetland E-6 and WEA also include sea fig (*Carpobrotus chilensis*), fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), bull thistle (*Cirsium vulgare*), Jersey cudweed (*Pseudognaphalium luteoalbum*), prickly sow thistle (*Sonchus asper* subsp. *asper*), common sow thistle (*Sonchus oleraceus*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativus*), parrot's feather (*Myriophyllum aquaticum*), and silver-leaf cotoneaster (*Cotoneaster pannosus*).
4 Wetland acreage will only be delineated during spring of the expected final year of mitigation monitoring (i.e. year 5), and the target acreage will be the total added acres of wetland adjacent to Wetland E-6, Pond 6, and Pond 7 compared to 2016 documented conditions.
~~5 Vegetation rooted in the pond bottom but leaves and stems extend out of the standing water or are emerged above the waterline.~~
5 Wetland vegetation includes plant species considered to be Obligate (OBL), Facultative (FAC), and Facultative-Wet (FACW) within the USACE National Wetland Plant List for the Western Mountains, Valleys & Coast, 2016 Regional Wetland Plant List.

TABLE 1-1 (CONTINUED)
MITIGATION SITE PERFORMANCE STANDARDS AND ANNUAL SUCCESS CRITERIA

NOTES: (continued)

6 Percent cover performance standard for Pond 2 is only applicable to vegetated emergent wetland edges that lie approximately 15 to 20 feet from the pond berm edge.

7 No live plantings were installed at upland riparian sites; thus, this criterion included in the monitoring plan is irrelevant.

Modifications to the performance metrics were incorporated in 2021 (Year 4) after communication with regulatory agencies overseeing the mitigation monitoring and reporting effort. RWQCB concurrence on modifications to performance criteria as shown in this table was received on 4.14.21 and 4.27.21 via email.

SOURCE: ARCADIS, 2016b, ESA, 2021

1.4 Responsible Parties

The Mendocino Railway is responsible for implementing the project MMP and confirming mitigation sites meet the performance standards and success criteria outlined in this document.

Robert Pinoli
Mendocino Railway
100 West Laurel Street
Fort Bragg, California 95437

1.4.1 Report Preparation

Report Preparation:	Jiemin Guo ESA 787 The Alameda, Suite 250 San Jose, CA 95126	Nicole Ibañez ESA 1425 North McDowell Blvd Petaluma, CA 94954	Rachel Haines ESA 2600 Capitol Ave, Suite 200 Sacramento, CA 94816
Restoration Monitors:	Nicole Ibañez and Jiemin Guo (ESA)		

This page intentionally left blank

SECTION 2
Revegetation Monitoring

2.1 Site Revegetation

The following seed mixes (**Table 2-1**) were applied to the OU-E mitigation sites at 25 pounds per acre.

TABLE 2-1
SEED MIXES

Scientific Name	Common Name	Percent of Mix	Mitigation Site Applied
Wet Meadow			
Cyperus eragrostis	tall flat sedge	25	Wetland E-1 (RAA-T1), WEA,
Elymus triticoides	creeping wild rye	25	
Hordeum brachyantherum	meadow barley	50	
Ponded Wetland			
Juncus effusus	common bog rush	30	Pond 7, Pond 2, Pond 3
Typha latifolia	broadleaf cattail	70	
Riparian Forest			
Bromus carinatus	California brome	35	RAA-1, RAA-2, RAA-3, RAA-4
Elymus glaucus	blue wild rye	30	
Elymus triticoides	creeping wild rye	20	
Festuca microstachys	small fescue	15	

2.2 Monitoring Methods and Schedule

Mitigation monitoring in 2022 was performed on July 14 by ESA botanists Nicole Ibañez and Jiemin Guo. Mitigation monitoring is planned once a year for five years, in the late summer to early fall. The 2022 monitoring completes Year 5 monitoring, since restoration activities were completed in November and December 2017. In Year 4 (2021), several of the monitoring sites met their final (Year 5) success criteria. In a meeting between Mendocino Railway, Kennedy/Jenks, ESA, and the Resource Agencies, it was agreed that those monitoring sites already meeting final success criteria in Year 4 would not be monitored in 2022. The four sites monitored in 2022 included: WE-1, Pond 3, RAA-2 (upland riparian area only) and RAA-4 (upland riparian area only).

2.2.1 Species Richness

At each restoration monitoring site, an inclusive inventory of vascular plant species was documented along monitoring transects or through a visual assessment of the restored area. The complete list of plant taxa observed along the transects provided a measure of species richness for each of the restoration monitoring sites.

2.2.2 Vegetative Cover

Fixed, permanent transects were established at 16 locations within the OU-E mitigation sites. Wooden stakes labeled with the transect number and "start" or "end" were installed at the start and end points of each transect so that restoration monitors can easily relocate transect locations during subsequent monitoring events; GPS coordinates were also documented for the transect start and end points. At least two transects were monitored at each mitigation site except at Pond 2 due to the small disturbance area, and at Pond 7 where vegetative cover was assessed visually. **Table 2-2** (located at the end of this section) depicts the transect identification number, length, and the plot locations along each transect where vegetative cover is monitored. Figures 2 through 8 depict the locations of the wetland, pond, and riparian monitoring transects.

Based on the total length of the transect, between two and five plot locations were identified for each transect. Each plot is three feet by three feet in size ($9ft^2$), and the location of plots along the transect were randomly generated. Plot orientation to the transect generally alternate as planting area space will allow though on several occassions the plot was flipped to the other side to cover restored or created areas. The same plots will be monitored by the Restoration Monitor annually using visual estimations of plant cover (see pages 10-13 of the California Native Plant Society's [CNPS] Relevé Protocol for estimating vegetation cover, [CNPS 2007]). All plant species observed are recorded, along with their total cover value. Cover was estimated for each species and for total cover using the following relevé-type cover classes: 0-1%, 1-5%, 5-15%, 15-25%, 25-50%, 50-75%, and >75%. With cover information for each species, the data can later be summarized to provide the total vegetation cover, total cover of native species, total cover of non-native/naturalized species and target invasive species (all of which are non-natives), or other classifications that may be important for assessing the performance of the restored wetland, pond, and riparian areas as specified in the MMP. At Ponds 2 and 3, vegetative cover of native submerged, emergent, floating leaf, and free-floating leaf plants was also assessed (if standing water was present during the monitoring event or otherwise through knowledge of species ecology).

Data were summarized by sampling area. To generate mean values for a cover parameter in a transect, each cover class value in each quadrat was converted to the midpoint percentage of the range (i.e., for the 5-10 percent interval, the midpoint would be 7.5 percent), and these were averaged for each transect. Transect values were then averaged for each restoration site when more than one transect was monitored within a restoration site.

2.2.3 Hydrology Indicators Assessment

Wetland E-1 and Wetland Establishment Area

The presence or absence of primary and secondary wetland hydrology indicators was documented at the restored OU-E Lowland Wetlands during the annual monitoring event, as provided in the *USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (USACE 2010).

Primary indicators include observations of surface water, high water table, saturated soils, water marks, sediment deposits, drift deposits, algal mat or crust, iron deposits, surface soil cracks, inundation visible on aerial imagery, sparsely vegetated concave surface, salt crust, aquatic invertebrates, water stained leaves,[3] hydrogen sulfide odor, oxidized rhizospheres along living roots, presence of reduced iron, recent iron reduction in tilled soils, and stunted or stressed plants.

Secondary indicators include observations of inundation drainage patterns, evidence of current or recent soil saturation by presence of a dry season water table, saturation visible on aerial imagery, the geomorphic position of the feature, shallow aquitard, FAC-neutral test, raised ant mounds, and frost-heave hummocks. If no primary indicators are observed, a minimum of two secondary indicators is needed to confirm that wetland hydrology is present.

Pond 3

Presence of ponded water or moistness of soil (saturated, moist, or dry) was documented at each of the restored ponds during the annual monitoring event.

2.2.4 Delineated Acreage of Wetland (Year 5 Only)

During spring of the final anticipated year of monitoring (i.e., Year 5), the total added acres of wetland in the WEA adjacent to Wetland E-6, Pond 6, and Pond 7 was delineated and compared to conditions documented in the *2016 Wetland Delineation Verification* (Arcadis 2016a).

2.2.5 Depth to Groundwater

In previous years, depth to groundwater was measured at monitoring wells within the wetland establishment area. In Year 5, in lieu of measuring depth to groundwater at the wells, soil pits were dug during the process of delineating the final area of wetland establishment per the *USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010). Depth to groundwater was recorded on delineation sampling datasheets in **Appendix B**.

[3] Can also be a secondary indicator.

2.2.6 Flow Unimpeded, Channel Banks Stable (Wetland L)

At each of the mitigation sites within the upland riparian habitat surrounding Wetland L, the presence and depth of water in the stream was recorded during the annual monitoring event. Depth was measured using a rod marked with 10ths of feet from a fixed point at each excavation area and measured at the channel midpoint. Transect start and end points placed diagonally across the length of the wetland impact areas served as fixed points for taking water depth measurements. If no water is present, then soil moisture (e.g., saturated, moist, or dry) was documented. Evidence of substantive stream bed or bank erosion was photo documented and measured (i.e., width, length, and depth), as necessary.

2.2.7 Photo Documentation

Photographs documenting site conditions were established at a total of 17 permanent photo-monitoring points; 11 were established prior to the remediation action and an additional 6 were established during the first annual monitoring event in 2018. The photo-monitoring points were recorded with a GPS to allow easy relocation during annual monitoring by restoration monitors. Figures 1 through 8 depict the location of the 17 photo-monitoring points; photographs were taking facing the mitigation sites. In Year 5 (2022), photographs were only taken at a subset of the photo-monitoring points that correspond to the restoration sites being monitored in Year 5. **Appendix C** includes photos documenting conditions during the 2022 (Year 5) summer monitoring event, and the corresponding photos from previous monitoring years. Photos were taken at these same points annually to document landscape-level changes over time in the revegetation areas. Photos from each monitoring event can be qualitatively compared with the baseline conditions and previous years by comparing annual reports. Pre- and post-construction photos are also included in the Year 1 annual report Appendix C for reference.

Photos were also taken of each monitoring transect from the start and end point locations, as they were installed during the first monitoring event in 2018 (Year 1). The function of these photos is to assist in locating the transects under future monitoring efforts. Photos at the start and end points of each transect were taken during each monitoring event for use in qualitatively tracking evolution of the revegetated areas overtime. The 2022 (Year 5) transect photos are included in Appendix C.

TABLE 2-2
VEGETATIVE COVER MONITORING TRANSECTS

Transect ID Length (feet)	Monitoring Plot Location (feet)	Plot Orientation
W E-1 T1		
36.0	2.0	R
	8.0	L
	19.0	R
	27.0	R
	30.0	L
W E-1 T2 (Access)		
78.0	8.0	L
	24.0	R
	33.0	R
	45.0	L
WEA T1*		
114.5	1.0	R
	8.0	R
	41.0	L
	65.0	R
	105.0	L
WEA T2*		
138.0	3.0	R
	14.0	R
	56.0	R
	110.0	L
	123.0	R
WEA T3*		
105.0	2.0	R
	20.0	L
	31.0	L
	67.0	L
	91.0	L
Pond 2 T1*		
85.0	5.0	L
	16.0	L
	49.0	R
	72.0	L
	79.0	R
Pond 3 T1 (Access)		
32.5	3.0	R
	11.0	R
	17.0	L
	22.0	R
	29.0	L

TABLE 2-2
VEGETATIVE COVER MONITORING TRANSECTS

Transect ID Length (feet)	Monitoring Plot Location (feet)	Plot Orientation
Pond 3 T2		
66.0	4.0	L
	13.0	R
	21.0	R
	32.0	R
	55.0	R
RAA-1 T1 (Wetland)*		
21.5	3.0	R
	9.0	L
	13.0	R
RAA-1 T2 (Riparian)*		
23.0	2.0	L
	16.0	L
RAA-2 T1 (Wetland)*		
20.5	2.0	L
	10.0	R
RAA-2 T2 (Riparian)		
29.0	3.0	L
	11.0	R
	21.0	L
RAA-3 T1 (Wetland)*		
21.5	5.0	R
	14.0	R
RAA-3 T2 (Riparian)*		
53.0	4.0	L
	24.0	R
	42.0	L
RAA-4 T1 (Wetland)*		
19.0	4.0	R
	14.0	L
RAA-4 T2 (Riparian)		
26.5	2.0	R
	14.0	L
	20.0	L

NOTES:
* indicates the transect was not monitored in 2022 as the site achieved the final success criteria in 2021 (Year 4).

SECTION 3
Monitoring Results

Year 5 mitigation monitoring was conducted by ESA botanists Nicole Ibañez and Jiemin Guo on July 14, 2022, five years after seeding of the mitigation sites. As noted in Section 1, mitigation sites included in the 2022 monitoring event consisted only of those four mitigation sites that did not meet the Year 5 final success criteria in Year 4 (2021).

Overall native species richness and native/non-native/naturalized species percent cover is high, with all mitigation sites monitored in Year 5 exceeding these success criteria in 2022. Invasive species cover at Pond 3 and RAA-4 was below the 5 percent cover threshold and thus achieved the Year 5 success criteria. Due to the high percent coverage of Himalayan blackberry (*Rubus armeniacus)* at Wetland E-1 and RAA-2, these two sites did not meet the performance threshold of less than 5 percent invasive species cover in Year 5. This species was described as ubiquitous within the OU-E site prior to remediation activities and has been a priority species for adaptive management actions (weed removal) implemented onsite during the performance monitoring period (Arcadis 2016b). Although Wetland E-1 and RAA-2 upland riparian area exceeded the performance threshold for coverage of invasive species, annual management of target invasive species as required in the MMP will continue as part of general property management. Ongoing management will include mechanical and chemical treatments (as-needed) to curtail the spread of undesirable species (and specifically pampas grass and Himalayan blackberry), particularly as-needed within these two mitigation sites.

Therefore, the results of the Year 5 (2022) monitoring demonstrate the success of this restoration effort and support a request for release from the permit conditions requiring annual performance monitoring and reporting tasks described in this report with no continued annual performance monitoring or reporting efforts for the OU-E mitigation sites in 2023 or beyond.

The following subsections describe the quantitative monitoring results for 2022 per mitigation site and discuss the results in regard to the Year 5 success criteria.

3.1 OU-E Lowlands

3.1.1 Wetland E-1

Table 3-1 summarizes Wetland E-1 performance in 2022 against Year 5 criteria for vegetative cover and wetland hydrology. These monitoring elements are discussed in detail in the following subsections.

TABLE 3-1
WETLAND E-1 PERFORMANCE IN YEAR 5

Performance Standard	Results			Year 5 Success Criterion Met?	
	Revegetation Transects				
Revegetation Cover Type	**1**	**2**	**Average**		
Native Wetland Meadow Plant Species Richness	7	7	7	6	**Yes**
Native/Non-native/Naturalized Vegetation Percent Cover	67.1	112.5	89.8	70%	**Yes**
Invasive Vegetation Percent Cover	2.0	18.88	10.44	<5%	**No**
Wetland Hydrology					
Wetland Hydrology Indicators Present?	Yes			Yes	**Yes**

Species Richness

The wet meadow seed mix was applied to the Wetland E-1 disturbance area which included both the excavation area and access route and consisted of tall flat sedge (*Cyperus eragrostis*; 25%), creeping wild rye (*Elymus triticoides*; 25%), and meadow barley (*Hordeum brachyantherum*; 50%). Meadow barley was the only seeded species observed along at least one of the two monitoring transects (transect 1) within the Wetland E-1 disturbance area in Year 5. **Table 3-2** lists the native wetland plant species recorded along the two monitoring transects during the 2022 monitoring event.

TABLE 3-2
NATIVE WETLAND PLANT SPECIES RECORDED AT WETLAND E-1 TRANSECTS IN YEAR 5

Scientific Name	Common Name	Wetland Status[1]	T1 (Excavation Area)	T2 (Access Route)
Native Species			**7**	**7**
Epilobium ciliatum	fringed willowherb	FACW		•
Equisetum arvense	field horsetail	FAC	•	•
Hordeum brachyantherum[2]	**meadow barley**	**FACW**	•	
Juncus effusus	common bog rush	FACW	•	•
Juncus ensifolius	swordleaf rush	FACW		•
Juncus hesperius	coast rush	FACW	•	
Mimulus floribundus	many flowered monkeyflower	OBL	•	•
Oenanthe sarmentosa	water parsley	OBL	•	•
Scirpus microcarpus	panicled bulrush	OBL	•	•

NOTES:
1 Species considered to be Obligate (OBL), Facultative (FAC), and Facultative-Wet (FACW) within the U.S. Army Corps of Engineers National Wetland Plant List for the Western Mountains, Valleys & Coast, 2016 Regional Wetland Plant List (USACE, 2016).
2 **BOLD** species were included in the Wet Meadow hydroseed mix.

Vegetation Percent Cover

Table 3-3 depicts the percent cover results for Wetland E-1 in 2022 per species and summarized by native, non-native/naturalized, and target invasive species categories. At Wetland E-1, native/non-native/naturalized species cover along the monitoring transects through the revegetated area (which includes both the excavation area and the access route) was above the Year 5 performance threshold of 70 percent cover, with an average of 89.80 percent cover. Transect 2 (access) had a higher percent cover of native species with 75.50 percent than Transect 1 (excavation area) with 60.90 percent. Panicled bulrush (*Scirpus microcarpus*; 30.00%) was the native species in the most abundance and with the highest percent cover on Wetland E-1 (averaged) transects in Year 5, followed by many flowered monkeyflower (*Erythranthe floribunda*; 18.99%) and field horsetail (*Equisetum arvense*; 12.19%). The most abundant non-native/naturalized species was common velvet grass (17.28%) which was more present along the access transect (30.75%) than the excavation area transect (3.80%). Common velvet grass was not listed as a co-dominant at Wetland E-1 in the pre-construction CRAM assessment but likely encroached from the neighboring WEA where it was identified as a co-dominant invasive species at Wetland E-5 and E-6 prior to project implementation (Arcadis 2016b). Common velvet grass grew rapidly between the 2018 and 2019 monitoring events, but its cover appears to have stabilized by 2022. Invasive species at Wetland E-1 consisted of pampas grass and Himalayan blackberry. The most abundant target invasive species was Himalayan blackberry, located entirely along the access transect with 16.38 percent cover. Total average cover of target invasive species at Wetland E-1 was 10.44 percent which exceeded the Year 5 performance threshold of less than 5 percent absolute cover.

Wetland E-1 well surpassed the Year 5 performance threshold for native/non-native/naturalized species cover, with an average coverage of 89.80%. Compared to nearby undisturbed wetlands, invasive species at this site were concentrated within the access disturbance area, not the restored wetland (excavation) area. If the invasive species cover of the restored excavation area were reported separately from the restored access route, it would have achieved the invasive species performance threshold of less than 5 percent for Year 5 with 2 percent cover of invasive species in 2022.

Wetland Hydrology Indicators

During the 2022 monitoring event, primary wetland hydrology indicators observed at the Wetland E-1 site included saturation and salt (crust) deposits which all indicate the area is seasonally inundated or ponded.

TABLE 3-3
WETLAND E-1 VEGETATIVE PERCENT COVER BY SPECIES IN YEAR 5

Scientific Name	Common Name	Percent Cover		
		T1 (Excavation Area)	T2 (Access)	Average
Native Species total		**60.90**	**75.50**	**68.20**
Epilobium ciliatum	fringed willowherb	0.00	0.75	0.38
Equisetum arvense	field horsetail	13.50	10.88	12.19
Hordeum brachyantherum[2]	**meadow barley**	0.60	0.00	0.30
Juncus effusus	common bog rush	2.00	4.0	3.00
Juncus ensifolius	swordleaf rush	0.00	0.75	0.38
Juncus hesperius	coast rush	0.60	0.00	0.30
Mimulus floribundus	many flowered monkeyflower	21.10	16.88	18.99
Oenanthe sarmentosa	water parsley	0.60	4.75	2.68
Scirpus microcarpus	panicled bulrush	22.5	37.50	30.00
Non-native / Naturalized Species total		**6.20**	**37.00**	**21.60**
Festuca arundinacea	tall fescue	1.20	1.50	1.35
Holcus lanatus	common velvet grass	3.80	30.75	17.28
Lotus corniculatus	bird's foot trefoil	0.60	2.50	1.55
Polypogon monspeliensis	annual rabbit's foot grass	0.00	0.75	0.38
Trifolium campestre	field clover	0.00	0.13	0.06
Vicia sativa	garden vetch	0.60	0.00	0.30
Vicia tetrasperma	four seeded vetch	0.00	0.75	0.38
Target Invasive[2] Species total		2.00	18.88	10.44
Cortaderia jubata	pampas grass	2.00	2.50	2.25
Rubus armeniacus	Himalayan blackberry	0.00	16.38	8.19

NOTES:
1 **BOLD** species were included in the Wet Meadow hydroseed mix.
2 Target invasive species are pampas grass (*Cortaderia* sp.), English ivy (*Hedera helix*), iceplant (*Carpobrotus edulis*), and Himalayan blackberry (*Rubus armeniacus*).

3.2 South Ponds

3.2.1 Pond 3

Table 3-4 summarizes Pond 3 performance in 2022 against Year 5 criteria for vegetative cover and wetland hydrology. Pond 3 exceeded the Year 5 performance metrics. These monitoring elements are discussed in the following subsections.

TABLE 3-4
POND 3 PERFORMANCE IN YEAR 5

Performance Standard	Results			Year 5 Performance Criterion Met?	
	Revegetation Transects				
Revegetation Cover Type	1	2	Average		
Native Wetland Plant Species Richness	7	7	7	4	**Yes**
Native/Non-native/Naturalized Vegetation Percent Cover	96.4	113.3	104.85	80%	**Yes**
Invasive Vegetation Percent Cover	6.6	0.6	3.6	<5%	**Yes**
Wetland Hydrology					
Ponded Water Indicators Present?	Yes			Yes	**Yes**

Species Richness

The ponded wetland seed mix was applied in 2017 to the Pond 3 disturbance area which included both the excavation area and access route within the pond banks. Two seeded species, broadleaf cattail and common bog rush, were recorded along the monitoring transects in Year 5. **Table 3-5** lists the native wetland plant species observed within Pond 3 during the 2022 monitoring event.

TABLE 3-5
NATIVE WETLAND PLANT SPECIES RECORDED AT POND 3 TRANSECTS IN YEAR 5

Scientific Name	Common Name	Wetland Status[1]	T1 (Access)	T2 (Excavation Area)
Native Species			**7**	**7**
Equisetum arvense	field horsetail	FAC	•	•
Juncus effusus[2]	**common bog rush**	**FACW**	•	•
Mimulus floribundus	manyflowered monkeyflower	OBL	•	
Oenanthe sarmentosa	water parsley	OBL	•	•
Persicaria hydropiperoides	water pepper	OBL	•	•
Scirpus microcarpus	panicled bulrush	OBL	•	•
Stachys ajugoides	bugle hedgenettle	OBL		•
Typha latifolia[2]	**broadleaf cattail**	**OBL**	•	•

NOTES:
1 Species considered to be Obligate (OBL), Facultative (FAC), and Facultative-Wet (FACW) within the U.S. Army Corps of Engineers National Wetland Plant List for the Western Mountains, Valleys & Coast, 2016 Regional Wetland Plant List (USACE, 2016).
2 **BOLD** species were included in the Ponded Wetland hydroseed mix.

Vegetation Percent Cover

Table 3-6 presents the percent cover results for Pond 3 in 2022 by species and summarized by native, non-native/naturalized, and target invasive species categories as well as native submerged, emergent, floating leaf, and free-floating leaf plants. Native species cover along the revegetated monitoring transects at Pond 3 in Year 5 was 87.9 percent, all of which were emergent species. The total cover of native/non-native/naturalized species was 104.9 percent which far exceeded the

Year 5 success criterion of 80 percent cover of native/non-native naturalized emergent vegetation. The most abundant species in the sampled plots were native field horsetail (47.8%), native common bog rush (22.6%), native panicled bulrush (10.1%), and non-native/naturalized common velvet grass (14.1%). Cover of target invasive species in Pond 3 averaged 3.6 percent which achieves the Year 5 success criteria of less than 5 percent absolute cover.

TABLE 3-6
POND 3 VEGETATIVE PERCENT COVER BY SPECIES IN YEAR 5

Scientific Name	Common Name	Percent Cover		
		T1	T2	Average
Native Species total		**87.7**	**88.0**	**87.9**
Submerged Aquatic Plant total		**-**	**-**	**-**
Emergent[1] Aquatic Plant total		**87.7**	**88.0**	**87.9**
Equisetum arvense	field horsetail	54.0	41.5	47.8
Juncus effusus[2]	**common bog rush**	9.2	36	22.6
Mimulus floribundus	manyflowered monkeyflower	2.0	0	1.0
Oenanthe sarmentosa	water parsley	3.2	0.6	1.9
Persicaria hydropiperoides	water pepper	2.0	0.6	1.3
Scirpus microcarpus	panicled bulrush	12.7	7.5	10.1
Stachys ajugoides	bugle hedgenettle	0	0.6	0.3
Typha latifolia[2]	**broadleaf cattail**	4.6	1.2	2.9
Free Floating Leaf Aquatic Plant total		**-**	**-**	**-**
Non-native / Naturalized Species total		**8.7**	**25.3**	**17.0**
Holcus lanatus	common velvet grass	8.7	19.5	14.1
Melilotus indicus	annual yellow sweetclover	0	0.6	0.3
Trifolium campestre	field clover	0	4.0	2.0
Trifolium repens	white clover	0	0.6	0.3
Vicia villosa	winter vetch	0	0.6	0.3
Target Invasive Species[3] total		**6.6**	**0.6**	**3.6**
Cirsium vulgare	bull thistle	0	0.6	0.3
Cortaderia jubata	Pampas grass	2.6	0	1.3
Rubus armeniacus	Himalayan blackberry	4.0	0	2

NOTES:
1 Vegetation rooted in the pond bottom but leaves and stems extend out of the standing water or are emerged above the waterline.
2 **Bold** species were included in the Ponded Wetland hydroseed mix.
3 Target invasive species area pampas grass (*Cortaderia* sp.), English ivy (*Hedera helix*), iceplant (*Carpobrotus edulis*), and Himalayan blackberry (*Rubus armeniacus*). The monitoring plan identifies bull thistle (*Cirsium vulgare*) as invasive species within the Wetland E-1 and wetland establishment area mitigation sites. Due to the innate ability of these species to quickly spread and overcome less robust native species seeded within the OU-E mitigation sites, they were included in the target invasive species percent cover calculation for this feature to better represent the presence of undesirable species within the revegetated area and inform management recommendations for control of such species.

Ponded Water Hydrology Indicators

During the 2021 monitoring event, saturated soils and inundated areas were observed which indicate the area is seasonally ponded.

3.3 Seasonal Wetland Ditch (Wetland L) and Riparian Areas

3.3.1 RAA-2

Table 3-7 summarizes the RAA-2 upland riparian area performance in 2022 against Year 5 criteria for vegetative cover and wetland hydrology. RAA-2 achieved the success criteria for cover of native/non-native/naturalized species but exceeded the cover threshold for invasive species. These monitoring elements are discussed in detail in the following subsections. Note that only the upland riparian area was monitored in 2022 as the wetland L transect within the RAA-2 mitigation site achieved the final Year 5 performance metrics in Year 4 (2021).

TABLE 3-7
RAA-2 PERFORMANCE IN YEAR 5

Performance Standard	Results	Year 5 Success Criterion Met?
Revegetation Cover Type	**Revegetation Transect (Upland Riparian)**	**Upland Riparian**
Native/Non-native/Naturalized Vegetation Percent Cover	82.6	70% **Yes**
Invasive Vegetation Percent Cover	31.2	<5% **No**
Hydrology		
Flow unimpeded, channel and bank stable?	-	N/A

Vegetation Percent Cover

Table 3-8 presents the percent cover results for RAA-2 upland riparian transect in 2022 per species and summarized by native, non-native/naturalized, and target invasive species categories.

Native/non-native/naturalized species cover along the RAA-2 riparian monitoring transect was 82.7 percent which exceeded the Year 5 success criterion of 70 percent cover. The species in greatest abundance along the RAA-2 riparian transect were field horsetail (25.8%) and common velvet grass (*Holcus lanatus,* 24.2%). The target invasive species with the highest coverage at this location was Himalayan blackberry (16.8 %). The total coverage of invasive species along the RAA-2 riparian transect (31.2%) exceeds the Year 5 performance threshold (<5%).

Flow Unimpeded, Channel Banks Stable (Wetland L)

As in 2019 and 2021, no surface water was present in Wetland L at site RAA-2 in 2022; flow obstructions within the channel were not observed. Sediment within the wetland area was moist to saturated.

Observations of Erosion

No erosion of backfill material was observed in 2022. Meander observed in 2018 is still present to the east of the constructed channel where elevation is lower than backfill material in the wetland restoration area. This secondary channel is likely only used during high flow events.

TABLE 3-8
RAA-2 VEGETATIVE PERCENT COVER BY SPECIES IN YEAR 5

Scientific Name	Common Name	Percent Cover
		Upland Riparian
Native Species[1] total		**39.8**
Carex tumulicola	Splitawn sedge	1.0
Cyperus eragrostis	tall flatsedge	1.0
Elymus triticoides	creeping wild rye	3.3
Equisetum arvense	field horsetail	25.8
Morella californica	California wax myrtle	3.33
Oenanthe sarmentosa	water parsley	3.33
Rubus ursinus	California blackberry	0.0
Stachys ajugoides	bugle hedgenettle	2.0
Non-native/Naturalized Species total		**42.83**
Anthoxanthum odoratum	sweet vernal grass	3.3
Holcus lanatus	common velvet grass	24.2
Hypochaeris radicata	Hairy cats ear	1.0
Lotus corniculatus	burclover	0.0
Trifolium campestre	field clover	3.3
Vicia tetrasperma	four seeded vetch	6.7
Vicia sativa	garden vetch	1.0
Target Invasive[2], Species total		**31.2**
Cirsium vulgare	bull thistle	3.3
Raphanus sativus	cultivated radish	6.7
Rubus armeniacus	Himalayan blackberry	16.8
Sonchus asper	spiny sowthistle	3.3
Sonchus oleraceus	common sowthistle	1.0

NOTES:
1 **Bold** species were included in the Riparian Forest hydroseed mix.
2 Target invasive species are pampas grass (*Cortaderia* sp.), English ivy (*Hedera helix*), iceplant (*Carpobrotus edulis*), and Himalayan blackberry (*Rubus armeniacus*). The monitoring plan identifies bull thistle (*Cirsium vulgare*) as an invasive species within the Wetland E-1 and wetland establishment area mitigation sites. Due to the innate ability of this species to quickly spread and overcome less robust native species seeded within the OU-E mitigation sites, it was included in the target invasive species percent cover calculation for this feature to better represent the presence of undesirable species within the revegetated area and inform management recommendations for control of such species.

3.3.2 RAA-4

Table 3-9 summarizes the RAA-4 upland riparian area performance in 2022 against Year 5 criteria for vegetative cover and wetland hydrology. RAA-4 achieved all Year 5 performance metrics in 2022. These monitoring elements are discussed in detail in the following subsections. Note that only the riparian area was monitored in 2022 as the wetland L transect within the RAA-4 mitigation site achieved the final Year 5 performance metrics in Year 4 (2021).

TABLE 3-9
RAA-4 PERFORMANCE IN YEAR 5

Performance Standard	Results	Year 5 Success Criterion Met?
Revegetation Cover Type	**Revegetation Transect (Upland Riparian)**	**Upland Riparian**
Native/Non-native/Naturalized Vegetation Percent Cover	109.7	70% **Yes**
Invasive Vegetation Percent Cover	1.0	<5% **Yes**
Hydrology		
Flow unimpeded, channel and bank stable?	Yes	N/A

Vegetation Percent Cover

Table 3-10 presents the percent cover results for the RAA-4 upland riparian transect in 2022 by species and summarized by native, non-native/naturalized, and target invasive species categories. At RAA-4, native/non-native/naturalized species cover along the upland riparian monitoring transect exceeded the Year 5 success criterion of 70 percent cover, with 109.7 percent cover.[4] The most abundant species along the riparian transect was native California blackberry (25.8%), followed by native silver bush lupine (*Lupinus albifrons*; 19.2%). The invasive species coverage was 1.0 percent, which achieves the Year 5 success criteria.

TABLE 3-10
RAA-4 VEGETATIVE PERCENT COVER BY SPECIES IN YEAR 5

Scientific Name	Common Name	Upland Riparian
Native Species[1] total		**46.0**
Equisetum arvense	field horsetail	1.0
Lupinus albifrons	silver lupine	19.2
Rubus ursinus	California blackberry	25.8
Non-native / Naturalized Species total		**63.7**
Anthoxanthum odoratum	sweet vernal grass	1.0
Avena barbata	slender oat	5.3
Bromus diandrus	ripgut brome	7.7
Festuca bromoides	brome fescue	33.3
Holcus lanatus	common velvet grass	3.3
Hypochaeris radicata	hairy cat's ear	3.3
Linum bienne	small-flowered flax	4.3
Plantago lanceolata	narrowleaf plantain	1.0
Trifolium campestre	field clover	1.0
Vicia sativa	garden vetch	3.3
Target Invasive[2] Species total		**1.0**
Carduus pycnocephalus	Italian thistle	1.0

NOTE:
1 **Bold** species were included in the Riparian Forest hydroseed mix.
2 Target invasive species are pampas grass (*Cortaderia* sp.), English ivy (*Hedera helix*), iceplant (*Carpobrotus edulis*), and Himalayan blackberry (*Rubus armeniacus*).

[4] Percent cover exceeds 100% in this case due to vegetation overlap when assessing layers of vegetation within the monitoring plot (absolute cover).

Flow Unimpeded, Channel Banks Stable (Wetland L)

As in 2019 and 2021, no surface water was present in Wetland L at site RAA-4 in 2022; flow obstructions within the channel were not observed. Sediment within the wetland restoration area was saturated.

Observations of Erosion

No evidence of erosion of backfill material was observed within the wetland channel in 2022.

3.4 Wetland Establishment Area – Delineated Wetland Acreage

In the final year of monitoring, the MMP and project permits require delineation of wetlands potentially jurisdictional to the U.S. Army Corps of Engineers (USACE) in the wetland establishment area to document the extent of successfully created wetland beyond pre-project conditions at this location (within the footprint of former Wetland E-6 and adjacent to Pond 7 and Pond 6) as verified by the USACE in 2016 (Arcadis 2016a). The MMP and project permits specify that to be considered successful, at least 0.548 acre of additional USACE-jurisdictional wetland must be present within the wetland establishment area when compared with 2016 conditions. ESA performed an aquatic resources delineation within the wetland establishment area on April 26, 2022. In summary, the project resulted in an additional 0.737 acre of USACE-jurisdictional wetland compared to 2016 conditions which more than achieves the performance metric. Appendix B contains the more detailed results of the 2022 delineation.

Mendocino Railway seeks to establish a mitigation credit with the excess 0.189 acre created within the WEA beyond the 0.548 acre compensatory mitigation required for the OU-E Soil and Sediment Removal Action impacts on waters of the U.S. and State. The 0.189-acre created wetlands will be included in mitigation accounting for anticipated impacts on aquatic resources associated with potential future development in the vicinity of the OU-E Lowlands.

SECTION 4
Conclusions and Recommendations

4.1 Conclusions

Table 4-1 provides a summary of annual monitoring results by site and monitoring year against associated annual success criteria. In 2022, the OU-E mitigation sites are demonstrating success in achieving high-functioning wetland and riparian features through restoration or creation with minimal adaptive management interference. Each wetland mitigation site is exceeding their native wetland plant species richness threshold and their native/non-native/naturalized species cover criterion for Year 5. Although Wetland E-1 and RAA-2 upland riparian area exceeded the performance threshold for coverage of invasive species, continued annual management of target invasive species, which predates the remediation project, and as required in the MMP, will include mechanical and chemical control measures to curtail the spread of invasive species as part of general property management, and particularly as-needed within these two mitigation sites. Because all wetland mitigation sites have been successful in achieving native species richness and native/non-native/naturalized species cover performance criteria, that most of the sites contain an acceptable threshold of invasive species cover, and invasive species management within the OU-E site will continue after the close of the monitoring period, the mitigation sites are considered successful and no further monitoring, reporting, or adaptive management actions, aside from annual invasive species control, are recommended to fulfill mitigation commitments required by the project permits.

4.2 Future Actions

No adaptive management is proposed in response to the Year 5 monitoring results. Mendocino Railway will implement long-term invasive species control within the OU-E site as described in the MMP and as has been the practice of the landowner prior to and throughout the mitigation establishment period (Arcadis 2016b). Annual maintenance will control undesirable, invasive species within the site boundaries. At a minimum, Mendocino Railway will implement control of invasive species within the OU-E site once per year generally in early spring (approximately April). Invasive species control crews will be trained to identify target invasive weeds from the seedling stage so young plants can be controlled before maturation and seed set. Mechanical treatments are recommended to take place just before or during flowering, but prior to seed production, generally in early spring (approximately April). Himalayan blackberry control is recommended to include hand pulling using a tool such as a Pulaski or pick mattock. It is recommended to remove the canes, roots, and root crowns to avoid root sprouting, as cutting and removing only the aboveground biomass will result in stimulated growth of root sprouts. In combination with mechanical control methods, young weeds can be controlled via spot spraying of herbicide approved for use in aquatic habitats (e.g., glyphosate) to avoid overspray pesticide

onto native species. With concurrence from regulatory agencies who have issued permits requiring the mitigation and monitoring and reporting tasks described in this annual report, no future annual performance monitoring or reporting of the OU-E mitigation sites will be conducted.

TABLE 4-1
MITIGATION SITE PERFORMANCE AGAINST ANNUAL SUCCESS CRITERIA IN 2018, 2019, 2021 AND 2022

Mitigation Sites	Performance Standard	Success Criteria and Performance by Monitoring Year				
OU-E Lowlands		**Year 1 (2018)**	**Year 2 (2019)**	**Year 3 (2020)**	**Year 4 (2021)**	**Year 5 (2022)**
Seep Wetland (Wetland E-1)	Native wet meadow plant species richness	1	2	3	5	6
Achieved Year 5 native species richness performance thresholds.	*Wetland E-1 Annual Results*	*10*	*9*	-	*6*	*7*
	Native/non-native/naturalized vegetation percent cover	5	20	40	60	70
	Wetland E-1 Annual Results	*30.49*	*32.74*	-	*56.48*	*89.8*
Achieved Year 5 performance thresholds for native/non-native/ naturalized species cover	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
	Wetland E-1 Annual Results	*0*	*0*	-	*8.81*	*10.5*
	Wetland hydrology indictors present[2]	Y	Y	Y	Y	Y
Did not achieve Year 5 invasive species cover.	*Wetland E-1 Annual Results*	*Y*	*Y*	-	*Y*	-
South Ponds		**Year 1 (2018)**	**Year 2 (2019)**	**Year 3 (2020)**	**Year 4 (2021)**	**Year 5 (2022)**
Ponded Wetlands (Ponds 3)	Native wetland plant species richness	1	2	3	4	4
Achieved Year 5 native species richness performance thresholds.	*Pond 3 Annual Results*	*10.5*	*9*	--	*6.5*	*7*
	Native/non-native/naturalized wetland[5] vegetation percent cover[6]	5	25	50	75	80
	Pond 3 Annual Results	*51.25*	*30.6*	--	*69.1*	*104.9*
Achieved Year 5 performance thresholds for native/non-native/ naturalized species cover	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
	Pond 3 Annual Results	*0.25*	*0.75*	--	*0.6*	*3.6*
Achieved invasive species cover.	Ponded water indicators present	Y	Y	Y	Y	Y
	Pond 3 Annual Results	*Y*	*Y*	--	*Y*	--
Riparian Areas		**Year 1 (2018)**	**Year 2 (2019)**	**Year 3 (2020)**	**Year 4 (2021)**	**Year 5 (2022)**
Upland Riparian Habitat (RAA-2, RAA-4)	Native/non-native/naturalized vegetation percent cover	5	20	40	60	70
RAA-2 and RAA-4 achieved Year 5 performance thresholds	*RAA-2 Riparian Area Annual Results*	*39.83*	*60.67*	--	*27.3*	*82.6*
	RAA-4 Riparian Area Annual Results	37.33	46.0	--	66.3	*109.7*
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
RAA-2 did not achieve the Year 5 invasive species cover.	*RAA-2 Riparian Area Annual Results*	*30.83*	*0.00*	--	*5.0*	*31.2*
	RAA-4 Riparian Area Annual Results	*6.67*	*0.00*	--	*0.0*	*1.0*

TABLE 4-1 (CONTINUED)
MITIGATION SITE PERFORMANCE AGAINST ANNUAL SUCCESS CRITERIA IN 2018, 2019, 2021 AND 2022

NOTES:

1 Target invasive species are pampas grass (*Cortaderia* sp.), English ivy (*Hedera helix*), iceplant (*Carpobrotus edulis*), and Himalayan blackberry (*Rubus armeniacus*).
2 Document the presence of primary and secondary wetland hydrology indicators as provided in the USACE Regional Supplement to the Corps of Engineers Wetland Delineation manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010)
3 Target invasive species for Wetland E-6 and WEA also include sea fig (*Carpobrotus chilensis*), fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), bull thistle (*Cirsium vulgare*), Jersey cudweed (*Pseudognaphalium luteoalbum*), prickly sow thistle (*Sonchus asper* subsp. *asper*), common sow thistle (*Sonchus oleraceus*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativus*), parrot's feather (*Myriophyllum aquaticum*), and silver-leaf cotoneaster (*Cotoneaster pannosus*).
4 Wetland acreage will only be delineated during spring of the expected final year of mitigation monitoring (i.e. year 5), and the target acreage will be the total added acres of wetland adjacent to Wetland E-6, Pond 6, and Pond 7 compared to 2016 documented conditions.
5 Wetland vegetation includes plant species considered to be Obligate (OBL), Facultative (FAC), and Facultative-Wet (FACW) within the USACE National Wetland Plant List for the Western Mountains, Valleys & Coast, 2016 Regional Wetland Plant List.
6 Percent cover performance standard for Pond 2 is only applicable to vegetated emergent wetland edges that lie approximately 15 to 20 feet from the pond berm edge.

SOURCE: ARCADIS, 2016b; ESA, 2021. RWQCB concurrence on modifications to performance criteria received 4.14.21 and 4.27.21

This page intentionally left blank

SECTION 5
References

Arcadis, 2016a. Georgia-Pacific Former Wood Products Facility Wetland Delineation Verification, Fort Bragg, California. July 7, 2016.

Arcadis, 2016b. *Operable Unit E Mitigation and Monitoring Plan*, Fort Bragg Former Wood Products Facility, prepared for Georgia-Pacific LLC, July 2016 (revised August 2016).

California Native Plant Society, 2007. *California Native Plant Society Relevé Protocol.* CNPS Vegetation Committee. October 20, 2000 (revised August 23, 2007).

ESA, 2021. *Memorandum: Proposal to revise performance standards for mitigation sites within the Georgia-Pacific Mill Site Operable Unit E in Fort Bragg, California. Revised to incorporate clarifications requested by the RWQCB and to document the agencies' concurrence on approach described herein*, prepared for Kennedy/Jenks Consultants, June 7, 2021.

Kennedy/Jenks Consultants, 2018. Wetland Establishment Area Annual Report and As-Built Conditions for Georgia-Pacific Fort Bragg Mill Site, prepared for Georgia-Pacific LLC, January 31, 2018.

U.S. Army Corps of Engineers (USACE), 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) May 2010, Final Report, [ERDC/EL TR-10-3], U.S. Army Engineer Research and Development Center, Vicksburg, MS.

U.S. Army Corps of Engineers (USACE), 2016. National Wetland Plant List for the Western Mountains, Valleys & Coast, 2016 Regional Wetland Plant List.

This page intentionally left blank

Appendix A

Memorandum: Proposal to revise performance standards for mitigation sites within the Georgia-Pacific Mill Site Operable Unit E in Fort Bragg, California

This page intentionally left blank

ESA

2600 Capitol Avenue
Suite 200
Sacramento, CA 95816
916.564.4500 phone
916.564.4501 fax

esassoc.com

memorandum

date	June 7, 2021
to	Jeremie Maehr, Rachel Morgan, and Deonne Knill (Kennedy/Jenks)
cc	Dave Massengill (Georgia-Pacific), Gil Falcone and Catherine Iantosca (RWQCB), and Tabatha Miller (City of Fort Bragg)
from	Rachel Haines
subject	Proposal to revise performance standards for mitigation sites within the Georgia-Pacific Mill Site Operable Unit E in Fort Bragg, California. Revised to incorporate clarifications requested by the RWQCB and to document the agencies' concurrence on approach described herein.

Introduction and Background

Environmental Science Associates (ESA) has conducted two years of mitigation monitoring at the Operable Unit E (OU-E) mitigation sites at the Georgia-Pacific, LLC former Fort Bragg Wood Products Facility located at 90 Redwood Avenue in Fort Bragg, California in 2019. This work was conducted on behalf of Kennedy/Jenks Consultants (Kennedy/Jenks), and for Georgia-Pacific LLC (Georgia-Pacific) following implementation of the OU-E Soil and Sediment Removal Action (project). The purposes of the mitigation are to:

1) restore in-kind and in-place the following areas disturbed by project activities to pre-remediation conditions:

    - 0.064 acre of temporarily impacted waters of the United States (0.056-acre of wetlands and 0.008 acre of stream);
    - 0.476 acre of waters of the State (which includes the 0.064-acre impacts to waters of the U.S.); and
    - 0.020 acre of upland riparian habitat

    and,

2) to establish an additional 0.548 acre of seasonal wetland/seep wetland habitat (wetland establishment area [WEA]) in the OU-E Lowlands around the existing wetland E-6 and with a similar function to E-6. The WEA is intended to form a larger, interconnected wetland area encompassing the existing wetland E-6 and nearby Ponds 6 and 7. The actual area of seasonal wetland/seep wetland habitat established with creation of the WEA is approximately 1.25 acres.

Restoration of wetlands and riparian habitat and creation of the wetland establishment area was implemented in accordance with the *Operable Unit E Mitigation and Monitoring Plan*[1] (MMP) and as described in the *Wetland Establishment Area Annual Report* and *As-Built Conditions for Georgia-Pacific Fort Bragg Mill Site*.[2] The goal of the monitoring program is to verify that wetland and riparian habitat restoration and WEA creation compensates for temporary project impacts.

The subject mitigation sites are associated with the following permits:

- USACE Section 404 Permit – File Number 2009-00372
- RWQCB Section 401 Permit – WDID Number 1B16655WNME
- CDFW Streambed Alteration Agreement – Notification Number 1600-2016-0265-R1
- City of Fort Bragg Coastal Development Permit – CDP 03-16

Thus far, two annual monitoring reports have been submitted documenting performance of the mitigation sites in Year 1 (2018)[3] and Year 2 (2019)[4] according to monitoring and reporting methods identified in the MMP.

Performance in Years 1 and 2

As documented in the Year 2 (2019) report, all mitigation sites are performing well with high vegetative cover and low presence of target invasive species. All wetland and pond sites are exceeding the native species richness criteria (this is not criterion for the riparian sites). Of the nine mitigation sites, five are meeting all performance criteria (WE-1, P7, P3, RAA-2, RAA-4). For three sites (WEA, RAA-1, and RAA-3) the native species cover criteria, which increases with each year, will be more challenging to achieve based on current conditions related to the expanding presence of non-native/naturalized species. Only one site (P2) is not meeting the invasive species cover criteria.

Purpose and Goals

Modification of Performance Metrics

Non-native/Naturalized Species

In response to observations and data collected during two years of quantitative monitoring of the nine mitigation sites in 2018 and 2019, it is our opinion that the current performance metrics do not account for influence from the surrounding environment on the mitigation sites. Specifically, the extensive presence of non-native/naturalized species within the entirety of OU-E which have colonized mitigation sites and positively contribute to vegetative cover and species diversity. Current performance standards do not consider the ecological benefits of vegetative cover from these non-native/naturalized species in combination with native species that

[1] Arcadis, 2016. *Operable Unit E Mitigation and Monitoring Plan*, Fort Bragg Former Wood Products Facility, prepared for Georgia-Pacific LLC, July 2016 (revised August 2016).

[2] Kennedy/Jenks Consultants, 2018. Wetland Establishment Area Annual Report and As-Built Conditions for Georgia-Pacific Fort Bragg Mill Site, prepared for Georgia-Pacific LLC, January 31, 2018.

[3] ESA, 2018. Georgia Pacific Mill Site OU-E Mitigation Monitoring Year 1 Report. Prepared for Kennedy/Jenks, December.

[4] ESA, 2020. Georgia Pacific Mill Site OU-E Mitigation Monitoring Year 2 Report. Prepared for Kennedy/Jenks, January.

were seeded or have otherwise colonized the site since restoration. It is also unrealistic to effectively and efficiently control the presence of non-native/naturalized species at mitigation sites given their distribution throughout the surrounding area. The most prolific non-native/naturalized species observed gaining cover over the two monitoring years is common velvet grass (*Holcus lanatus*) – a facultative species whose presence is increasingly familiar in the local coastal landscape due to its dispersal potential and competitiveness. Common velvet grass was documented in the baseline CRAM assessment of project impact areas where it was identified as a co-dominant at the WEA location.[5] Because of its presence within OU-E prior to the project, and understanding the species' competitiveness, it is expected common velvet grass will continue to spread within the mitigation sites over the long term and influence overall species composition and cover dynamics. We propose the performance standards be modified to consider cover of non-native/naturalized species with cover of native species against the annual success criterion, as shown in **Table 1**, below. RWQCB concurrence on approach received 4.14.21.

Wetland Plant Types

Performance standards for the South Ponds mitigation sites (P2 and P3) include cover of emergent native wetland[6] plant species where qualifying vegetation is rooted in the pond bottom but leaves and stems extend out of the standing water or are emerged above the waterline. Both P2 and P3 sites have already exceeded native species richness goals for Year 5 and the majority of native species within the mitigation sites are wetland plants. Because the performance standard specifies cover goals for emergent native wetland plants, these other wetland plant types are not being adequately considered in evaluating the success of the restored wetland. We propose expanding the wetland plant types in this performance standard beyond emergent plants to include submerged, floating leaf, and free-floating leaf plants. RWQCB concurrence on approach received 4.14.21.

Invasive Species

The MMP identified target invasive species for all mitigation sites which include pampas grass (*Cortaderia* sp.), English ivy (*Hedera helix*), iceplant (*Carpobrotus edulis*), and Himalayan blackberry (*Rubus armeniacus*). Georgia-Pacific has and continues to perform routine maintenance of OU-E for these species. In addition to these four species, the MMP further specifies target invasive species for Wetland E-6 and WEA include sea fig (*Carpobrotus chilensis*), fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), bull thistle (*Cirsium vulgare*), Jersey cudweed (*Pseudognaphalium luteoalbum*), prickly sow thistle (*Sonchus asper* subsp. *asper*), common sow thistle (*Sonchus oleraceus*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativus*), parrot feather watermilfoil (*Myriophyllum aquaticum*), and silver-leaf cotoneaster (*Cotoneaster pannosus*). None of these species are currently or expected to exceed the less than five percent cover annual success criteria at these two mitigation sites.

Parrot feather watermilfoil has not been documented at the WE-6 or WEA where it is considered a target invasive. This species is present in P2 where it was identified in the baseline CRAM assessment with a 33 percent species co-dominance and the only species dominating the short plant layer. Because this is the only mitigation site where parrot feather watermilfoil has been identified to date, it has been included in the invasive species cover calculations for P2 in the Year 1 (2018; 25.1 percent) and Year 2 (2019; 28.75 percent) annual monitoring reports. Without control of this species in the entirety of P2 (which requires use of chemical herbicides),

[5] See MMP Appendix A for detailed results of the CRAM assessment.

[6] Species considered to be Obligate (OBL), Facultative (FAC), and Facultative-Wet (FACW) within the U.S. Army Corps of Engineers National Wetland Plant List for the Western Mountains, Valleys & Coast, 2016 Regional Wetland Plant List (USACE, 2016).

achieving goal of less than five percent cover in any monitoring year is not possible. Since this species occurs throughout the entire pond (which predates the project impact and restoration activities) we propose that target invasive species be limited to those identified for P6 in the MMP and parrot feather watermilfoil no longer be considered in evaluation of the P2 mitigation site performance related to cover of invasive species. However, if we were to omit parrot feather watermilfoil from the wetland plant cover calculations entirely, it is unlikely the vegetative cover of the other native and naturalized wetland plants in P2 would achieve the performance criteria goals for wetland plant cover (75% cover in year 4 and 80% cover in year 5). This specie's co-dominance within P2 during the baseline assessment likely influenced the mitigation site wetland plant cover performance criteria annual goals. Therefore, it is appropriate that parrot feather water milfoil contribute toward the native/naturalized wetland plant species cover calculations for Pond 2, consistent with the *Non-native/Naturalized Species* modification, described above. RWQCB concurrence on approach received 4.27.21.

We propose the following modifications to performance standards established in the MMP and shown in Table 1 in **bold underline** (for additions) and ~~strikethrough~~ (for deletions). Further modifications to the criterion from those shown below are not anticipated.

TABLE 1
PROPOSED MODIFICATIONS TO MITIGATION SITE PERFORMANCE STANDARDS AND ANNUAL SUCCESS CRITERIA

Mitigation Sites	Performance Standard	Success Criteria by Monitoring Year				
		Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	Year 4 (2021)	Year 5 (2022)
OU-E Lowlands						
Seep Wetland (Wetland E-1, RAA-T1)	Native wet meadow plant species richness	1	2	3	5	6
	Native**/non-native/naturalized** vegetation percent cover	5	20	40	60	70
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
	Wetland hydrology indictors present[2]	Y	Y	Y	Y	Y
Seasonal/Seep Wetland (Wetland E-6 and Establishment Area)	Native wet meadow plant species richness	1	2	3	4	4
	Native**/non-native/naturalized** vegetation percent cover	15	30	40	50	60
	Invasive vegetation percent cover[3]	<5	<5	<5	<5	<5
	Depth to groundwater (inches)	<12	<12	<12	<12	<12
	Wetland hydrology indictors present	Y	Y	Y	Y	Y
	Delineated acreage of wetland[4]	--	--	--	--	0.54
Ponded Wetlands (Pond 7)	Native wetland plant species richness	0	1	1	3	3
	Native vegetation percent cover	5	25	50	75	80
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
	Ponded water indicators present	Y	Y	Y	Y	Y
South Ponds						
Ponded Wetlands (Ponds 2 and 3)	Native wetland plant species richness	1	2	3	4	4
	~~Emergent[5]~~ **Native/non-native/naturalized wetland[5]** vegetation percent cover[6]	5	25	50	75	80
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
	Ponded water indicators present	Y	Y	Y	Y	Y

Mitigation Sites	Performance Standard	Success Criteria by Monitoring Year				
		Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	Year 4 (2021)	Year 5 (2022)
Riparian Areas						
Seasonal Wetland Ditch (Wetland L)	Flow unimpeded, channel and bank stable	Y	Y	Y	Y	Y
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5
Upland Riparian Habitat (RAA-1, RAA-2, RAA-3, RAA-4)	Native**/non-native/naturalized** vegetation percent cover	5	20	40	60	70
	~~Planted native tree/shrub percent survival[7]~~	~~100~~	~~90~~	~~85~~	~~85~~	~~85~~
	Invasive vegetation percent cover[1]	<5	<5	<5	<5	<5

NOTES:
1 Target invasive species are pampas grass (*Cortaderia* sp.), English ivy (*Hedera helix*), iceplant (*Carpobrotus edulis*), and Himalayan blackberry (*Rubus armeniacus*).
2 Document the presence of primary and secondary wetland hydrology indicators as provided in the U.S. Army Corps of Engineers (USACE), 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) May 2010, Final Report, [ERDC/EL TR-10-3], U.S. Army Engineer Research and Development Center, Vicksburg, MS.)
3 Target invasive species for Wetland E-6 and WEA also include sea fig (*Carpobrotus chilensis*), fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), bull thistle (*Cirsium vulgare*), Jersey cudweed (*Pseudognaphalium luteoalbum*), prickly sow thistle (*Sonchus asper* subsp. *asper*), common sow thistle (*Sonchus oleraceus*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativus*), parrot's feather (*Myriophyllum aquaticum*), and silver-leaf cotoneaster (*Cotoneaster pannosus*).
4 Wetland acreage will only be delineated during spring of the expected final year of mitigation monitoring (i.e. year 5), and the target acreage will be the total added acres of wetland adjacent to Wetland E-6, Pond 6, and Pond 7 compared to 2016 documented conditions.
5 ~~Vegetation rooted in the pond bottom but leaves and stems extend out of the standing water or are emerged above the waterline.~~
5 Wetland vegetation includes plant species considered to be Obligate (OBL), Facultative (FAC), and Facultative-Wet (FACW) within the USACE National Wetland Plant List for the Western Mountains, Valleys & Coast, 2016 Regional Wetland Plant List.
6 Percent cover performance standard for Pond 2 is only applicable to vegetated emergent wetland edges that lie approximately 15 to 20 feet from the pond berm edge.
7 **No live plantings were installed at upland riparian restoration sites; thus, this criterion included in the monitoring plan is irrelevant.**
RWQCB concurrence on modifications to performance criterion received 4.14.21
SOURCE: Arcadis, 2016; ESA, 2021.

Additional Reference Transects

In addition to modifying the performance standards shown in Table 1, we propose vegetation cover and species composition data be collected along reference transects for comparison with mitigation site data and evaluation of restoration success to wetland and riparian areas of the local coastal region. Comparison of species composition, diversity, and overall health and vigor of the OU-E restored and created sites with existing features in the surrounding area will be an important consideration in evaluating the overall success of the restoration in the future. During the next monitoring event, planned for July 2021, monitors will establish up to four reference transects through wetland and riparian features within the OU-E site and/or at a yet to be determined site in the local vicinity and representative of local coastal wetlands and/or riparian habitat. The expected outcome is that monitoring data from these reference transects would be similar to vegetative cover and species composition observed within the mitigation areas and demonstrate their successful establishment and function in the context of the local coastal environment. When comparing cover and species composition, the mitigation sites could be performing better than reference sites but falling short of final success criteria. In this case, we may request release from the permit because the site has achieved as good or better conditions than comparable sites. Data collected from reference transects are not intended to be used to further modify performance metrics from those proposed herein. RWQCB concurrence on approach received on 4.27.21

Quantitative monitoring will resume in July 2021 and results will be measured against the year 4 success criteria. It is expected that with these modified performance standards, each mitigation site will achieve or exceed the year 4 metrics. Data collected from reference transects will be incorporated into the Year 4 (2021) annual report and considered in evaluating success of the sites. Should the 2021 monitoring results achieve or exceed the year 5 metrics, the mitigation sites will have succeeded in establishing functional, self-sustaining ecosystems and no

further performance monitoring or reporting will be required in 2022, upon regulatory agency confirmation. RWQCB concurrence on approach received on 4.27.21

This approach considers the input from collective regulators as discussed on the March 22, 2021 conference call and incorporates clarifications requested by the Regional Water Quality Control Board via email on April 21, 2021. On April 27, the Regional Water Quality Control Board emailed a statement of concurrence with the revised approach documented herein. Therefore, these revised performance standards will be used in the forthcoming 2021 monitoring event.

Sincerely,

Rachel Haines, Senior Biologist
Mitigation Monitoring and Reporting Task Lead

Appendix B
Aquatic Resources Delineation Report

This page intentionally left blank

GEORGIA PACIFIC MILL SITE OU-E SOIL AND SEDIMENT REMOVAL ACTION – COMPENSATORY MITIGATION FULFILLMENT

Aquatic Resources Delineation Report

Introduction

This report documents the methods and results of a boundary delineation of aquatic resources at the site of a wetland establishment area within the Mendocino Railway (formerly Georgia-Pacific, LLC.) Mill Site's Operable Unit E (OU-E), created in December 2017 to fulfill compensatory mitigation requirements for impacts to waters of the United States (U.S.) and waters of the State associated with the OU-E Soil and Sediment Removal Action (project). This delineation documents conditions five years after creation as required by the project permits. The wetland establishment area (WEA) was created to establish an additional 0.548 acres of seasonal wetland/seep wetland habitat in the OU-E Lowlands around the existing Wetland E-6 and with a similar function. The WEA is intended to form a larger, interconnected wetland area encompassing the existing Wetland E-6 and nearby Ponds 6 and 7. **Figure 1** in **Attachment A** depicts the boundaries of the pre-existing and created features within the WEA in 2017. The study area for this delineation includes the approximately 1.25-acre WEA around the existing Wetland E-6, and bordered by Ponds 6 and 7 and Wetland E-5.

Restoration of wetlands and riparian habitat and creation of the wetland establishment area was implemented in accordance with the *Operable Unit E Mitigation and Monitoring Plan* (Arcadis, 2016b; MMP) and as described in the *Wetland Establishment Area Annual Report and As-Built Conditions for Georgia-Pacific Fort Bragg Mill Site* (Kennedy/Jenks, 2018). The goal of the aquatic resources delineation report is to convey results of the field survey which confirm the WEA adequately fulfills the project's compensatory mitigation requirements.

History

Pre-project conditions in the OU-E Lowlands were delineated by WRA Inc. (WRA) in 2009 and by Arcadis in 2010 (Arcadis, 2011). On March 15, 2010, the U.S. Army Corps of Engineers (USACE) issued an Approved Jurisdictional Determination (AJD) for wetlands delineated within the OU-E Lowlands by WRA in 2009 (File # 2009-00372N). In June 2016, the USACE conducted a verification of wetlands delineated within the OU-E Lowlands, the shoreline area of Fort Bragg Landing adjacent to the OU-E Lowlands, and the Riparian Area. Due to changes in site conditions since the Arcadis 2010 delineation, some wetland boundaries were revised to reflect observed conditions during the USACE verification site visit. These changes were

documented in a July 7, 2016 memorandum (Arcadis, 2016a). On August 9, 2017, the U.S. Army Corps of Engineers (USACE) issued an Approved Jurisdictional Determination (AJD) for wetlands delineated within the OU-E Lowlands by Arcadis as revised in 2016 following the verification site visit (File # 2009-00372N). Wetland boundaries of previously delineated features presented in this memo reflect USACE input from 2016.

To create the WEA, the existing ground surfaces in the areas north, west, and east of Wetland E-6 and north of Pond 7 were graded to lower the ground surface elevation by between approximately 12 to 18 inches and bring the new ground surface elevation within approximately 12 inches of groundwater. A berm was constructed near the southern edge of the WEA north of Pond 7, at the east end of the pond and approximately 20 feet north of the west end boundary. Once grading was complete, locally collected seeds were hand scattered in the prepared area, live plants collected nearby were also planted, and the Wet Meadow hydroseed mix was applied. **Table 1** depicts the species included in the WEA hydroseed mix.

TABLE 1
WEA HYDROSEED MIX

Scientific Name	Common Name	Percent of Mix
Wet Meadow		
Cyperus eragrostis	tall flat sedge	25
Elymus triticoides	creeping wild rye	25
Hordeum brachyantherum	meadow barley	50

Methodology

An aquatic resources delineation site visit was conducted on April 26, 2022 by ESA biologist Nicole Ibañez. The delineation used the "Routine Determination Method" as described in the *1987 Corps of Engineers Wetland Delineation Manual*, hereafter called the "1987 Manual" (Environmental Laboratory, 1987). The 1987 Manual was used in conjunction with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coasts Region (Version 2.0)* (USACE, 2010). **Attachment B** includes the soils report from the Natural Resources Conservation Service (NRCS) web soil survey (NRCS, 2022).

In accordance with the USACE guidance, sample points were taken at sites representative of the vegetation, hydrology, and physical characteristics across the aquatic feature types. Western Mountains, Valleys and Coasts data sheets were used to record information at each data point, which are provided in **Attachment C**. In addition, representative datapoint locations and wetland boundaries were recorded using a global positioning system (GPS) with sub-meter accuracy (Trimble EOS Positioning System – Arrow Series receiver with Esri's ArcGIS Field Maps application).

This survey focused on areas outside of the wetland features already delineated and verified in previous years. Newly established wetlands that occur in previously upland areas count towards

the mitigation goals for this project. Therefore, new wetland areas were mapped separately from previously delineated wetlands, regardless of continuity.

Results

One new 0.74-acre wetland is present in the WEA (**Attachment D**). The new wetland is surrounding, and continuous with Wetland E-6, and also connects to the west side of Wetland E-5. The wetland is located east of Pond 6 and north of Pond 7, and is separated from both ponds by upland berms. The new wetland was dominated by rushes (*Juncus* spp.), velvet grass (*Holcus lanatus*), hyssop loosestrife (*Lythrum hysoppifolia*), cattail (*Typha latifolia*), and horsetail (*Equisetum arvense*), along with associate species salt grass (*Distichlis spicata*), curly dock (*Rumex crispus*), and meadow barley (*Hordeum brachyantherum*). Soils across the wetland exhibited a depleted matrix with distinct or prominent redoximorphic features (F3), sandy redox (S5), and hydrogen sulfide (A4) soil indicators. Surface water and saturation were present in most areas during the survey. Sample datapoints 1, 3, and 5 are representative of conditions found in the wetland. Sample datapoints 2 and 4 are characteristic of conditions in adjacent upland. This feature is classified as *Palustrine, Emergent, Persistent* according to the Cowardin classification system (FGDC, 2013). **Photos 1 through 3** are representative of conditions within the WEA study area.

Conclusions

The restoration activities in the WEA resulted in additional creation of 0.737 acre of potentially jurisdictional wetland. This satisfies the success criteria developed in the MMP to add at least 0.548 acre of wetland in the spring of Year 5 monitoring.

Mendocino Railway seeks to establish a mitigation credit with the excess 0.189 acre created within the WEA beyond the 0.548 acre compensatory mitigation required for the OU-E Soil and Sediment Removal Action impacts on waters of the U.S. and State. The 0.189-acre created wetlands will be included in mitigation accounting for anticipated impacts on aquatic resources associated with potential future development in the vicinity of the OU-E Lowlands.

References

Arcadis, 2016a. Georgia-Pacific Former Wood Products Facility Wetland Delineation Verification, Fort Bragg, California. July 7, 2016.

Arcadis, 2016b. *Operable Unit E Mitigation and Monitoring Plan*, Fort Bragg Former Wood Products Facility, prepared for Georgia-Pacific LLC, July 2016 (revised August 2016).

Environmental Laboratory, 1987. *Corps of Engineers Wetland Delineation Manual*, January 1987, Final Report, Department of the Army Waterways Experiment Station, Vicksburg, Mississippi.

Federal Geographic Data Committee (FGDC), 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands

Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington DC.

Natural Resources Conservation Service (NRCS), 2022. Soils Online Mapper. Available at: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed September 9, 2022.

U.S. Army Corps of Engineers (USACE), 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains Valleys and Coasts Region (Version 2.0) ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Attachment A: Figure 1. Wetland Establishment Area and Aquatic Resources in 2017
Attachment B: Soils Report
Attachment C: Wetland Datasheets
Attachment D. Aquatic Resource Delineation of WEA
Attachment E: ORM Spreadsheet

Representative Photographs

SOURCE: ESA, April 2022

Photo 1
Wetland Establishment Area, facing north

SOURCE: ESA, April 2022

Photo 2
Data point 1, in a representative wetland area

SOURCE: ESA, April 2022

Photo 3
Data point 2, in a representative upland area adjacent to the wetland.

This page intentionally left blank

Attachment A

Figure 1. WEA and Aquatic Resources in 2017

Operable Unit-E

Operable Unit-E

Aquatic Resource Boundaries

Wetland

Pond

Mitigation Site

Wetland Establishment

Wetland Establishment Area

0 200

Feet

Path: U:\GIS\GIS\Projects\17xxxx\D170229.01_Mill Site Dam MMP\03_MXDs_Projects\ARD_Fig 1.mxd RHaines 10/26/2022

SOURCE: Kennedy/Jenks 7.25.18

201700229.06

Figure 1

Wetland Establishment Area and Other Aquatic Resources in 2017

ESA

Attachment B
Soils Report

This page intentionally left blank

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Mendocino County, Western Part, California

Fort Bragg Mill Site OU-E

September 9, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....8
Soil Map.....9
Legend.....10
Map Unit Legend.....11
Map Unit Descriptions.....11
Mendocino County, Western Part, California.....13
219—Urban land.....13
References.....15

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:856 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mendocino County, Western Part, California
Survey Area Data: Version 16, Sep 6, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 7, 2022—May 31, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
219	Urban land	3.0	99.4%
Totals for Area of Interest		**3.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Mendocino County, Western Part, California

219—Urban land

Map Unit Composition

Urban land: 75 percent
Minor components: 24 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fluviomarine deposits derived from sedimentary rock

Minor Components

Biaggi

Percent of map unit: 3 percent
Hydric soil rating: No

Shinglemill

Percent of map unit: 3 percent
Landform: Marine terraces
Hydric soil rating: Yes

Gibney

Percent of map unit: 3 percent
Hydric soil rating: No

Tregoning

Percent of map unit: 3 percent
Landform: Marine terraces
Hydric soil rating: Yes

Tropaquepts

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Heeser

Percent of map unit: 3 percent
Hydric soil rating: No

Cabrillo

Percent of map unit: 3 percent
Hydric soil rating: No

Harecreek

Percent of map unit: 3 percent
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Attachment C
Wetland Datasheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Fort Bragg Mill Site/WEA City/County: Mendicino Sampling Date: 4/26/2022

Applicant/Owner: Mendocino Railway State: CA Sampling Point: 1

Investigator(s): Nicole Ibanez Section, Township, Range: T18N R18W

Landform (hillslope, terrace, etc.): field Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C Lat: 39.44214 Long: -123.8114 Datum: NAD83

Soil Map Unit Name: Urban land NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Typha latifolia	5		
2. Equisetum arvense	10		
3. Lythrum hyssopifolia	30	Yes	OBL
4. Holcus lanatus	20	Yes	FAC
5. Festuca perennis	3		
6. Cotula coronopifolia	2		
7. Juncus patens	2		
8.			
9.			
10.			
11.			
	72 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 28

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10 YR 3/1	100					loamy sand	
3-14	10 YR 3/1	98	5 YR 5/8	2	C	M	loamy sand	large gravel/rocks in this layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✔ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ✔ No ___ Depth (inches): 0.5

Water Table Present? Yes ✔ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Fort Bragg Mill Site/WEA City/County: Mendocino Sampling Date: 04/26/2022

Applicant/Owner: Mendocino Railway State: CA Sampling Point: 2

Investigator(s): Nicole Ibanez Section, Township, Range: T18N R18W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): C Lat: 39.4421 Long: -123.8112 Datum: NAD83

Soil Map Unit Name: Urban land NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes _____ No ✔	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Holcus lanatus	35	Yes	FAC
2. Distichlis spicata	5		
3. Helminthotheca echioides	4		
4. Vicia sativa	5		
5. Cirsium vulgare	2		
6. Juncus effusus	8		
7.			
8.			
9.			
10.			
11.			
	59 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 41

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 35	x 3 = 105
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 35 (A)	105 (B)

Prevalence Index = B/A = 3

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR 3/1	100					loam	
3-10	10 YR 4/2	93	7.5 YR 4/6	7	C	M/PL	clay loam	lots of rocks
10-12	10 YR 2.5/1	100					sandy loam	lots of rocks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Fort Bragg Mill Site City/County: Mendocino Sampling Date: 04/26/2022

Applicant/Owner: Mendocino Railway State: CA Sampling Point: 3

Investigator(s): Nicole Ibanez Section, Township, Range: T18N R18W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): C Lat: 39.44199 Long: 123.8112 Datum: NAD83

Soil Map Unit Name: Urban land NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Holcus lanatus	40	Yes	FAC
2. Distichlis spicata	10		
3. Juncus effusus	5		
4. Rumex crispus	6		
5. Hordeum brachyantherum	3		
6. Geranium dissectum	2		
7. Helminthotheca echioides	2		
8. Deschampsia cespitosa	15	Yes	FACW
9.			
10.			
11.			
	83 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 17

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 55	x 3 = 165
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 2/1	100					loam	
2-14	7.5 YR 4/1	85	5 YR 4/6	15	C	M/PL	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): _____

Water Table Present? Yes ___ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 4

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Fort Bragg Mill Site City/County: Mendocino Sampling Date: 04/26/2022

Applicant/Owner: Mendocino Railway State: CA Sampling Point: 4

Investigator(s): Nicole Ibanez Section, Township, Range: T18N R18W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR): C Lat: 39.44176 Long: -123.8113 Datum: NAD83

Soil Map Unit Name: Urban land NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Melilotus indicus	15		
2. Vicia sativa	18	Yes	UPL
3. Bromus diandrus	25	Yes	UPL
4. Holcus lanatus	8		
5. Helminthotheca echioides	8		
6. Geranium dissectum	5		
7. Hordeum brachyantherum	3		
8.			
9.			
10.			
11.			
	82 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 18

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species 25	x 5 =	125
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = 5

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 3/2	100					loam	
2-7	10 YR 4/3	98	7.5 YR 4/6	2	C	M	clay loam	
7-12	2.5 Y 4/1	85	10 YR 4/8	15	C	M	clay loam	
12-16	2.5 Y 2/1	100					organic matter	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): _____

Water Table Present? Yes ___ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes ___ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Fort Bragg Mill Site City/County: Mendocino Sampling Date: 04/26/2022

Applicant/Owner: Mendocino Railway State: CA Sampling Point: 5

Investigator(s): Nicole Ibanez Section, Township, Range: T18N R18W

Landform (hillslope, terrace, etc.): field Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C Lat: 39.44176 Long: -123.8116 Datum: NAD83

Soil Map Unit Name: Urban land NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Juncus effusus	20	Yes	FACW
2. Vicia sativa	3		
3. Holcus lanatus	60	Yes	FAC
4. Lythrum hyssopifolia	5		
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	88 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 12

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	black							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✔ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): _____

Water Table Present? Yes ✔ No ___ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No ___

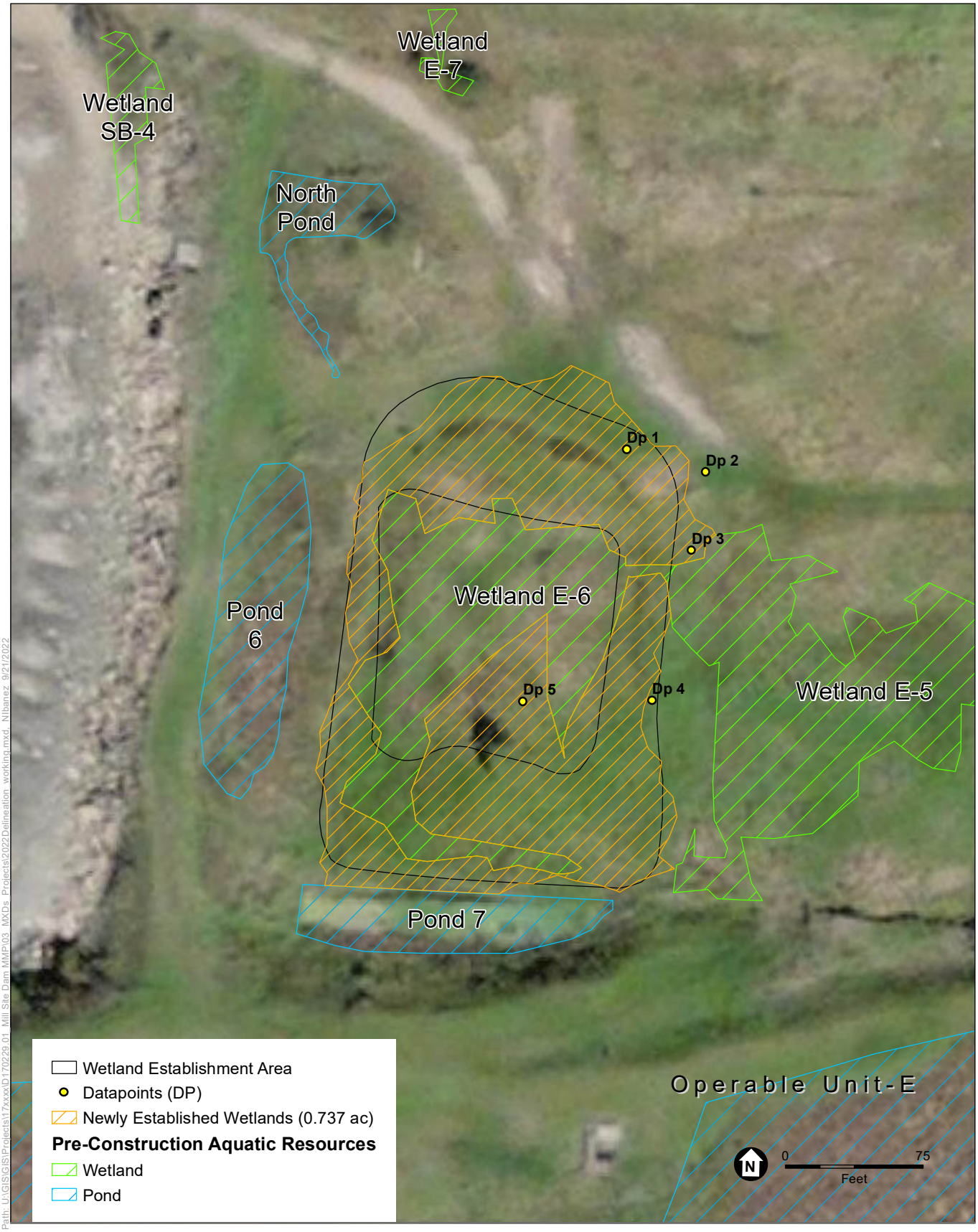
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
standing water ~1 inch, 4ft away

This page intentionally left blank

Attachment D

Aquatic Resource Delineation of WEA



SOURCE: Kennedy/Jenks 7.25.18; ESA, 2022

Georgia Pacific Mill Site OU-E Mitigation Monitoring . 170229.06

Attachment A
Aquatic Resources Delineated in Wetland Establishment Area

Attachment E
ORM Spreadsheet

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
Wetland	CALIFORNIA	PEM		Area	0.737	ACRE	TNWW	39.44176	-123.8116	

Appendix C
Photo Documentation

This page intentionally left blank

Photo Points

- Wetland E-1 (WE-1): 7A – 8
- Pond 3 (P3): 9 – 10B
- Pond 2 (P2): 11 – 12
- Riparian Area 2 (RAA2): 14A - C
- Riparian Area 4 (RAA4): 16A - D

Vegetative Cover Photos

- Wetland E-1: Transects 1 – 2
- Pond 3: Transects 1 – 2
- Riparian Area 2: Riparian Transects
- Riparian Area 4: Riparian Transects

Photo Point: 7A_WE-1 (Restored Excavation Area; July 31, 2018)

Photo Point: 7B_WE-1 (Restored Access; July 31, 2018)

Photo Point: 7A_WE-1 (Restored Excavation Area; July 25, 2019)

Photo Point: 7B_WE-1 (Restored Access; July 25, 2019)

Photo Point: 7A_WE-1 (Restored Excavation Area; July 14, 2021)

Photo Point: 7B_WE-1 (Restored Access; July 14, 2021)

Photo Point: 7A_WE-1 (Restored Excavation Area; July 14, 2022)

Photo Point: 7B_WE-1 (Restored Access; July 14, 2022)

Photo Point: 8_WE-1 (July 31, 2018)

Photo Point: 8_WE-1 (July 25, 2019)

Photo Point: 8_WE-1 (July 14, 2021)

Photo Point: 8_WE-1 (July 14, 2022)

Post-construction: Pond 3 excavation area, looking west (January 5, 2018)

Photo Point: 9_Pond 3 (July 25, 2019)

Photo Point: 9_Pond 3 (July 13, 2021)

Photo Point: 9_Pond 3 (July 14, 2022)

Photo Point: 10A_Pond 3 ramp (July 31, 2018)

Photo Point: 10B_Pond 3 excavation area (July 31, 2018)

Photo not taken in 2019	
Photo Point: 10A_Pond 3	Photo Point: 10B_Pond 3 (July 25, 2019)
Photo not taken in 2021	
Photo Point: 10A_Pond 3	Photo Point: 10B_Pond 3 (July 13, 2021)
	
Photo Point: 10A_Pond 3 (July 14, 2022)	Photo Point: 10B_Pond 3 (July 14, 2022)

Photo Point: 14A_RAA-2_Riparian Area (August 1, 2018)

Photo Point: 14B_RAA-2_Wetland Area (August 1, 2018)

Photo Point: 14A_RAA2_Riparian Area (July 24, 2019)

Photo not taken in 2019

Photo Point: 14B_RAA2_Wetland Area

Photo Point: 14A_RAA2_Riparian_facing East (July 13, 2021)

Photo Point: 14B_RAA-2_Wetland Area (July 13, 2021)

Photo Point: 14A_RAA2_Riparian_facing East (July 14, 2022)

Photo Point: 14B_RAA-2_Wetland Area (July 14, 2022)

Photo Point 16A: RAA-4_Riparian Area (August 1, 2018)

Photo Point 16B: RAA-4_Wetland Area (August 1, 2018)

Photo Point 16A: RAA 4_Riparian Area (July 24, 2019)

Photo not taken in 2019

Photo Point 16B: RAA 4_Wetland Area

Photo Point 16A: RAA 4_Riparian_facing East (July 13, 2021)

Photo Point 16B: RAA-4_Wetland Area (July 13, 2021)

Photo Point 16A: RAA 4_Riparian_facing East (July 14, 2022)

Photo Point 16B: RAA-4_Wetland Area (July 14, 2022)

WE-1: Transect 1_start 2018

WE-1: Transect 1_end 2018

WE-1: Transect 1_start 2019

WE-1: Transect 1_end 2019

WE-1: Transect 1_start 2021

WE-1: Transect 1_end 2021

WE-1: Transect 1_start 2022

WE-1: Transect 1_end 2022

WE-1: Transect 2_start 2018

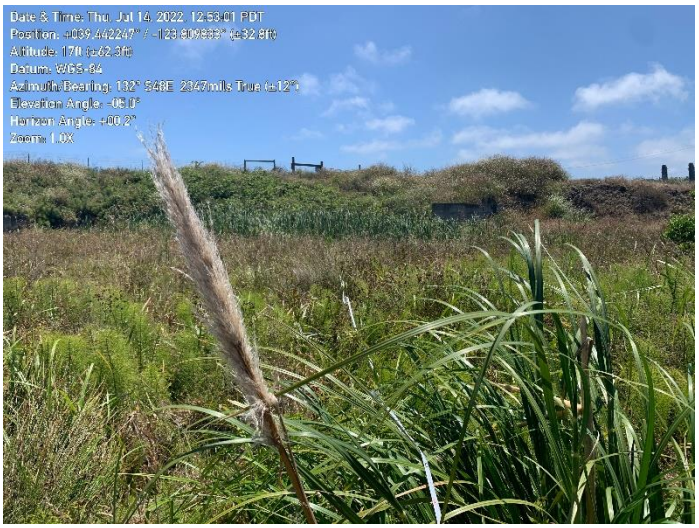
WE-1: Transect 2_end 2018

WE-1: Transect 2_start 2019

WE-1: Transect 2_end 2019

WE-1: Transect 2_start 2021

WE-1: Transect 2_end 2021



WE-1: Transect 2_start 2022

WE-1: Transect 2_end 2022

Pond 3: Transect 1_start 2018

Pond 3: Transect 1_end 2018

Pond 3: Transect 1_start 2019

Pond 3: Transect 1_end 2019

Pond 3: Transect 1_start 2021

Pond 3: Transect 1_end 2021

Pond 3: Transect 1_start 2022

Pond 3: Transect 1_end 2022

Pond 3: Transect 2_start 2018

Pond 3: Transect 2_end 2018

Pond 3: Transect 2_start 2019

Pond 3: Transect 2_end 2019

Pond 3: Transect 2_start 2021

Pond 3: Transect 2_end 2021

Pond 3: Transect 2_start 2022

Photo not taken in 2022

Pond 3: Transect 2_end

RAA-1: Riparian Transect_start 2018

RAA-1: Riparian Transect_end 2018

RAA-1: Riparian Transect_start 2019

RAA-1: Riparian Transect_end 2019

RAA-1: Riparian Transect_start 2021

RAA-1: Riparian Transect_end 2021

RAA-1: Riparian Transect_start 2022

RAA-1: Riparian Transect_end 2022

RAA-4: Riparian Transect_start 2018

RAA-4: Riparian Transect_end 2018

RAA-4: Riparian Transect_start 2019

RAA-4: Riparian Transect_end 2019

RAA-4: Riparian Transect_start 2021

RAA-4: Riparian Transect_end 2021

RAA-4: Riparian Transect_start 2022

RAA-4: Riparian Transect_end 2022