

WETLAND RESTORATION, BUFFER ENHANCEMENT, & MITIGATION AND MONITORING PLAN

for

1201 & 1211 North Main Street
Fort Bragg, CA
APN 069-241-27 & -04
Mendocino County

Property Owners:
Bob Hunt, Hunt Investments
PO Box 1470
McCall, ID 83638



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Table of Contents

1. PROJECT SUMMARY	1
2. BACKGROUND	1
2.1. Responsible Parties.....	1
3. PREVIOUS AND EXISTING ECOLOGICAL CONDITIONS.....	2
4. RESTORATION POTENTIAL.....	7
5. RESTORATION PLAN	7
5.1. Basis for Design.....	7
5.2. Performance Goals and Success Criteria	7
6. IMPLEMENTATION	8
6.1. Contour Topography within the Wetland Buffer	8
6.2. Rip and Amend Compacted Substrate within the Northern Wetland Buffer	8
6.3. Invasive Plant Removal.....	8
6.4. Establish Native Plants to Increase Biodiversity.....	10
6.5. Establish Native Plants to Provide Screening	13
6.6. Project Adaptation.....	13
6.7. Monitoring.....	13
7. SCHEDULE.....	14
8. REPORTING.....	15
9. REFERENCES	16
10. INVESTIGATOR BIOGRAPHIES.....	16

1. PROJECT SUMMARY

Natural resources and wetland delineation surveys were conducted as a part of the coastal development permit (CDP #1-2013) process to identify the potential building envelope for a visitor serving facility and parking area on a previously developed ~3.7-acre property consisting of two parcels, zoned Highway Visitor Commercial (CH) and Open Space (OS), located in the City of Fort Bragg in the Coastal Zone.

Two wetlands were identified on the property. The northern wetland is approximately 19,000 square feet in size, and the southern wetland is approximately 10,000 square feet in size, for a total area of approximately 0.9 acre of wetlands on the subject properties.

The project was designed to maximize developable area of the parcel for an inn and parking lot while avoiding the southern wetland by at least 30 feet and the northern wetland by at least 50 feet. SHN designed infrastructure and created a stormwater management plan to accommodate runoff up to the 85th percentile storm. The system is designed to treat and infiltrate the majority of rainwater running off the buildings, parking lot, and other non-permeable surfaces. Rain in excess of the 85th percentile storm will enter the northern wetlands through two swales designed to minimally alter topography within the wetland buffer in order to enhance the buffer area and wetland beyond it.

Currently, the two wetland areas are moderately impacted by invasive plant species including Himalayan blackberry, cape ivy, yellow flag iris, callalily, and wild radish. The areas outside the wetland, within the wetland buffers, are dominated by non-native plants that do not have functional relationships to the wetland habitat. As a part of the development process, the owners are proposing to enhance the wetlands and wetland buffer areas to improve the wetland habitat, and the functional relationships and protective ability of the habitat surrounding the wetlands. Enhancement will include removal of invasive species, planting appropriate natives, and soil amendment and minor re-contouring within the buffer area to improve wetland hydrology and habitat values.

2. BACKGROUND

A Biological Scoping Survey and wetland delineation was performed on the combined 3.7-acres of two parcels (APN 069-241-27 & -04) by Asa Spade, and published on April 21, 2015. The purpose of the studies was to locate special status plants and communities, wetlands and riparian areas, and special status animal habitats to determine if they would be directly or indirectly impacted by the proposed development. Subsequent surveys and studies have been conducted to provide additional information and to ensure that the reports reflects current conditions.

In order to maximize the usable area of the parcels and minimize wetland buffer distance while providing sufficient protection to the natural resources present this wetland restoration, buffer enhancement, and mitigation and monitoring plan has been developed.

2.1. Responsible Parties

The party responsible for making sure Mitigation and Monitoring Plan performance goals are met is:

Bob Hunt, Hunt InnVestments
PO Box 1470
McCall, ID 83638

This wetland restoration, buffer enhancement, & mitigation and monitoring plan was written by:

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3. PREVIOUS AND EXISTING ECOLOGICAL CONDITIONS

A fire in 2007 destroyed the inn that existed on the site prior to that time. **Figure 1** is a photograph of the inn on the southern parcel and residence and gravel stockpiles on the northern parcel, as well as the surrounding ecological conditions in 2002. The majority of the inn grounds were kept as a mowed lawn. Wetland vegetation can be seen in the lower left-hand side of the inn lot in the photo and a channel to the lower right. The vegetation along the strip of land lower in the photo (west of the lawn) appears to more closely resemble the vegetation further west across the Haul Road on State Parks land. The second parcel, to the north of the inn parcel shown, was used by the then adjacent business, Baxman Gravel, to stockpile gravel and other road base materials.



Figure 1. Image 11414, California Coastal Records Project, shows the lawn on the subject property in 2002.

Currently the vegetation on the subject parcels is comprised mainly of non-native, ornamental, and invasive plant species, with wetland communities along the northwest and southwest property boundaries. The main plant community present on the property, including the majority of the wetland buffer, is non-native grassland. Dominant species within the non-native grassland include common velvet grass (*Holcus lanatus*), creeping bentgrass (*Agrostis stolonifera*), tall fescue (*Festuca arundinacea*), sweet vernal grass (*Anthoxanthum odoratum*) and wild radish (*Raphanus sativus*). Non-native ruderal areas, invasive plants and ornamentals cover a significant portion of the property not covered by non-native grassland. Dominant plant species in ruderal areas, including the wetland buffer area east of the northern wetland, on what was the Baxman gravel site, include English plantain (*Plantago lanceolata*), bur-clover (*Medicago polymorpha*), buckhorn plantain (*Plantago coronopus*), wild radish (*Raphanus sativa*), vetch (*Vicia sativa*), and cape ivy (*Delairea odorata*).

Two areas of wetland are present on site. The northern wetland is approximately 19,000 square feet in size, and the southern wetland is approximately 10,000 square feet in size, for a total area of approximately 0.9 acre of wetlands on the subject properties. Within and near wetlands, patches of native vegetation were present. California blackberry brambles (*Rubus ursinus* ~2,000sqft) were present along the west property boundaries, just outside of wetlands, adjacent to the Haul Road. California wax myrtle (*Morella californica* ~2,300sqft) was present along the eastern edge of the northern wetland. Small-fruited bulrush (*Scirpus microcarpus* ~1,600sqft), broadleaf cattails (*Typha latifolia* ~2,500sqft), slough sedge (*Carex obnupta* ~3,750sqft), and water parsley (*Oenanthe sarmentosa* ~300sqft), were present within the northern wetland. Nootka rose (*Rosa nutkana* ~2,000sqft) occurred in a narrow patch along the Haul Road on the western side of the southern wetland.

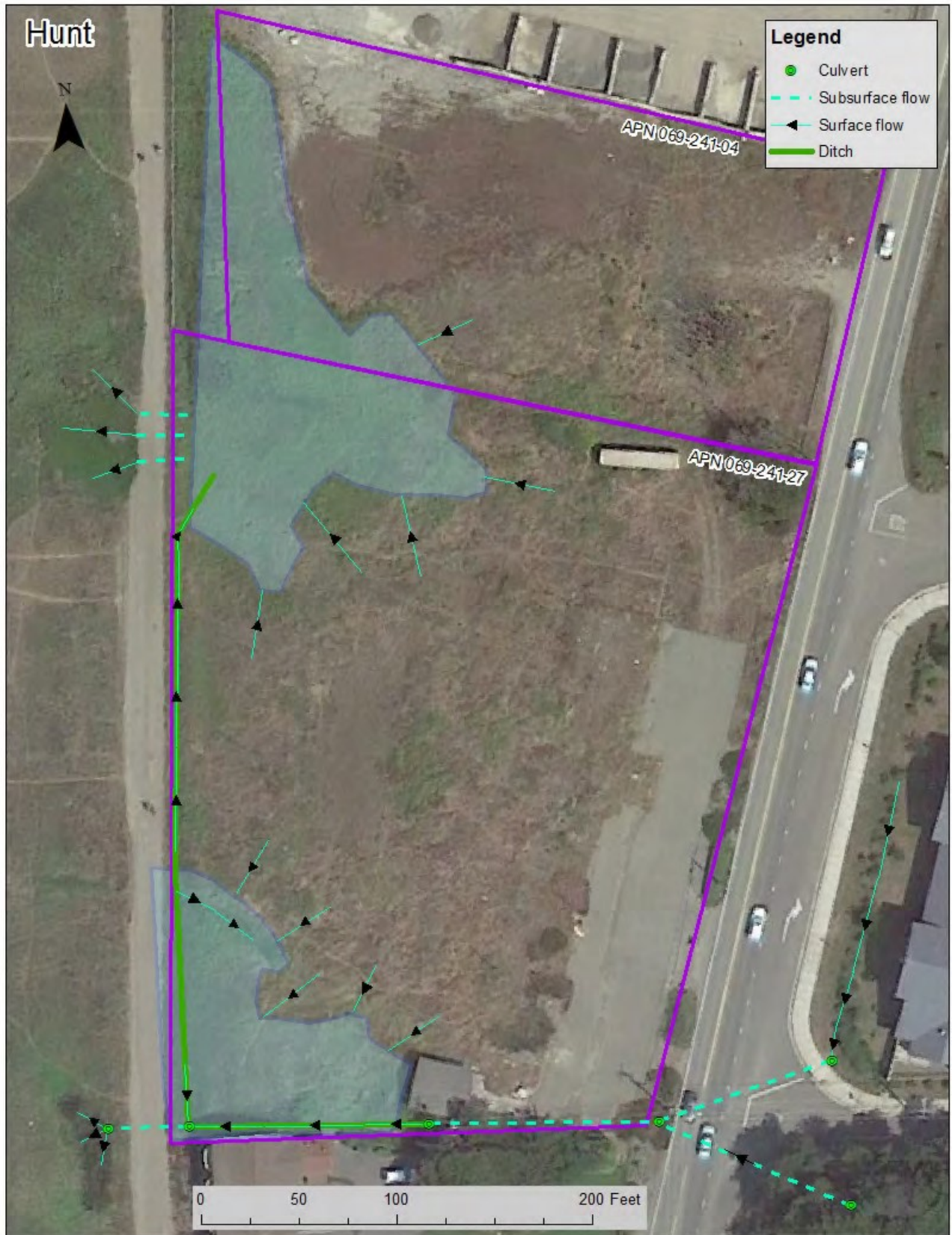


Figure 2. Wetlands documented on the site, with site hydrology indicated.

Portions of the wetlands on site are dominated by non-native invasive plants including Himalayan blackberry (*Rubus armeniacus*), cape ivy (*Delairea odorata*), pennyroyal (*Mentha pulegium*), callalily (*Zantedeschia aethiopica*), lollypop tree (*Myoporum laetum*), and yellow flag iris (*Iris pseudacorus*).



Figure 3. Himalayan blackberry along the western parcel boundary.



Figure 4. Calla lily within the northern wetland.



Figure 5. Lollypop trees within the southern wetland.



Figure 6. Yellow flag iris within the southern wetland at the southwestern corner of the project site.



Figure 7. Cape ivy within the northern wetland.



Figure 8. Iceplant within the northern wetland buffer area.



Figure 9. Wild radish directly adjacent to the northern wetland along the Haul Road.



Figure 10. Compacted soils and ruderal vegetation east of the northern wetland on the parcel that was previously Baxman gravel's stockpile area.

4. RESTORATION POTENTIAL

Targeted removal of specified non-native invasive plants will allow areas to revegetate with native species. Native plant species are more appropriate for native wildlife and will improve habitat. Minor recontouring of areas within the wetland buffer will improve site hydrology allowing for the best retention of rainwater on site. Ripping and amending the hard-compacted soils in the portion of the wetland buffer affected by the Baxman gravel operation will allow ruderal non-native vegetation to be replaced with native vegetation and allow rainwater to infiltrate the soil in this area. Removal of non-native vegetation within the wetland buffer and installation of appropriate native plants will enhance the wetland habitat, increasing the functional relationship between the wetlands and the habitat within the buffer area. Installation of appropriate native plants within the wetland and wetland buffer areas can increase biodiversity, add missing biological functions to the habitat, and perform habitat protective functions such as reducing light and noise entering the wetland habitat.

5. RESTORATION PLAN

5.1. Basis for Design

The intent of the Wetland Restoration and Buffer Enhancement Mitigation & Management Plan is to provide guidance on improving and maintaining a healthy wetland ecosystem. Following this plan will allow for development and use of the parcel at the same time are making the wetland habitat better than its conditions at the start of the project. This plan outlines performance goals and suggests methods for the property owner to meet these goals in order to increase wetland quality and improve the protective and habitat functions of the wetland buffer.

The proposed plan is performance-based which allows for management to be carried out in an adaptive manner whereby monitoring provides feedback and shows the manager areas within which efforts are successful, as well as areas that may need a different approach in order to meet the performance goals. Monitoring and restoration should occur for five years to meet the performance goals.

5.2. Performance Goals and Success Criteria

Goals for active management are as follows:

1. Maintain or increase the area meeting the definition of Coastal Act Wetland. At the end of the mitigation monitoring period wetland area shall be $\geq 29,000$ square feet.
2. Remove target non-native invasives: Himalayan blackberry (*Rubus armeniacus*), cape ivy (*Delairea odorata*), callalily (*Zantedeschia aethiopica*), iceplant (*Carpobrotus* spp.), bulbil bugle lily (*Watsonia meriana*), and yellow flag iris (*Iris pseudacorus*), from the wetland and buffer area. No plants of these target species shall be present within the wetland nor buffer area at the end of the mitigation monitoring period.
3. Increase wetland and wetland buffer native biodiversity. The wetland and wetland buffer areas shall support 20% more species of native plants at the end of the mitigation and monitoring period than the baseline count at the beginning of the project.
4. Increase relative coverage of native plants as compared to non-native plants. Relative coverage of native plants shall be $\geq 80\%$ within the wetland and $\geq 70\%$ within the buffer area at the end of the mitigation monitoring period. It should be noted that complete elimination of non-native species is an unrealistic goal. Some active management of non-natives within the wetland and buffer areas will always be necessary but the goal is to establish self-sustaining populations of native plants that will exclude as many non-natives as possible. Repeated soil disturbance caused by more intensive plant management provides more opportunities for ruderal non-native species to become established and this activity may also be more detrimental to native wildlife than the presence of some non-native plants.
5. Facilitate the wetland's natural flood control function and groundwater infiltration by contouring site topography and improving compacted soils to make them more friable.
6. Produce a quarterly record of management activities and site performance and submit this information to the planning department on a yearly basis. Photo points shall be established and photographs of the northern wetland, northern wetland buffer area, southern wetland, and southern wetland buffer area shall be taken each quarter. The annual report shall include

qualitative and quantitative data regarding each of the performance criterion outlined above.

6. IMPLEMENTATION

Suggested implementation procedures for the wetland restoration and buffer enhancement are outlined below. Completion of these procedures is a means and not an end; other ways to meet the goals and performance criteria outlined above may be utilized. Some adaptive management based on results is appropriate and expected. Conditions at the site, weather, and plant performance will all inform management decisions.

6.1. Contour Topography within the Wetland Buffer

SHN Consulting Engineers & Geologists, INC. has developed a stormwater management plan for the site. Within the wetland buffer, the plan includes two emergency spillways and a swale directing runoff from impervious surfaces on the site into a bio-retention swale outside the buffer area. Minor grading and recontouring of these areas within the buffer should be completed in order to direct overflow water resulting from large storm events into the northern wetland. The baseline condition of two of these areas is that they are vegetated with non-native grasses. The third area, an emergency spillway at the northern end of the project site, will be located in an area that is compacted and sparsely vegetated with non-native ruderal species. Grading and contouring should disturb and move the minimum volume of substrate necessary to achieve the functionality of the swale and emergency spillways as designed by SHN. Soils in these areas should be amended as necessary to support native vegetation and should be revegetated with native vegetation appropriate to the function of these features and the adjacent wetland habitat. These activities will improve the wetland buffer habitat by increasing native vegetation and will improve the wetland by maximizing the amount of stormwater runoff retained on site.

6.2. Rip and Amend Compacted Substrate within the Northern Wetland Buffer

Soils above the wetland on the western portion of the northern parcel have been compacted over time by the gravel operations on this parcel. The soil within the wetland buffer is thin and compacted, supporting only ruderal non-native species and non-native grasses. This area has very low habitat value and no functional relationships to the wetland it is buffering. Rather than taking a hands-off approach to this buffer area it should be enhanced in order to better protect the wetland and to expand the habitat value.

Soils in this area should be evaluated to determine the extent of fill and compaction. The upper layers should be ripped with appropriate heavy equipment (excluding within the Sensitive Resource Area no-dig zone), such as a backhoe or excavator, to a depth that effectively eliminates the compacted layer, or at least to 12 inches. Most plant roots are within the upper 12 inches of soil. Soils in this area should be tested for their ability to support native grasses and forbs and amended with appropriate materials according to the testing. Loosening of soil and adding amendments will result in a greater soil volume than the baseline. The removal of some of the soils may be necessary to maintain appropriate topography. Minor recontouring should occur in this area to facilitate natural drainage and to direct water discharged from the emergency spillway during a heavy rainfall event, as described in implementation section 6.1. above.

6.3. Invasive Plant Removal

Himalayan blackberry (*Rubus armeniacus*), cape ivy (*Delairea odorata*), callalily (*Zantedeschia aethiopica*), iceplant (*Carpobrotus* spp.), bulbil bugle lily (*Watsonia meriana*), and yellow flag iris (*Iris pseudacorus*) should be removed to the greatest extent practicable. These plants are to be specifically targeted for 100% removal, which should be achievable with the proper effort over the 5 year restoration period. These plant species easily resprout from roots and/or rhizomes, which must be grubbed out. Non-native plants within the wetland should be removed with hand tools. Power tools such as chainsaws and rototillers may be appropriate but heavy equipment should not be used within the wetland or in the Sensitive Resource Area no-dig zone. Within the buffer area the use of heavy equipment and vehicles used to load up and remove material should be minimized.

The majority of the invasive plants should be removed in a single effort in the first year of the

project; however, it is expected that root and rhizomes will be missed and will begin to regenerate. These plants should be removed when they become identifiable, or at least yearly until all plants of the target species listed above are eliminated (**Table 1**).

A second set of plants that should be removed includes Monterey pine (*Pinus radiata*), lollypop tree (*Myoporum laetum*), red hot poker (*Kniphofia uvaria*), garden nasturtium (*Tropaeolum majus*), cotoneaster (*Cotoneaster* spp.), Escallonia (*Escallonia* sp.). These plants are ornamental non-native plants introduced as landscaping that can spread but are generally not as pernicious. 100% removal of these species should be relatively easy to achieve.

Additional non-native plants present within the wetland and buffer area that should be removed to the extent practicable include poison hemlock (*Conium maculatum*), periwinkle (*Vinca* spp.), bull thistle (*Cirsium vulgare*), wild radish (*Raphanus sativus*), teasel (*Dipsacus* spp.), burclover (*Medicago* spp.), Aaron's beard (*Hypericum calycinum*), pennyroyal (*Mentha pulegium*), monbretia (*Crocosmia × crocosmiiflora*), bentgrass (*Agrostis* spp.), sweet vernal grass (*Anthoxanthum odoratum*), rattlesnake grass (*Briza maxima*), ripgut brome (*Bromus diandrus*), orchard grass (*Dactylis glomerata*), ryegrass (*Festuca perennis*), common velvetgrass (*Holcus lanatus*), and purple-awned wallaby grass (*Rytidosperma penicillatum*). This category of plants includes non-native invasive species that have become naturalized in coastal Northern California. The plants in this third category are unlikely to be eliminated from the project site; they should be managed as well as possible. The performance criteria allow for some presence of non-native plant coverage in acknowledgement of the diminishing returns expected in the effort to eliminate all non-native invasive species present within the wetland and buffer areas.

Category 1 species listed separately at the beginning of this section and within the performance criteria have been chosen because of their significant baseline coverage and due to the potential for eventual success eliminating them from the site. Category 2 species should be relatively easy to eliminate. Category 3 plants will be practically impossible to completely eliminate from the site but should be reduced as much as possible.

Table 1. Non-native and invasive species targeted for removal.

Category 1: Targeted invasive species - 100% Eradication	
<i>Rubus armeniacus</i>	Himalayan blackberry
<i>Delairea odorata</i>	cape ivy
<i>Zantedeschia aethiopica</i>	callalily
<i>Carpobrotus</i> spp.	iceplant
<i>Watsonia meriana</i>	bulbil bugle lily
<i>Iris pseudacorus</i>	yellow flag iris
Category 2: Non-Native but not as invasive – 100% removal	
<i>Pinus radiata</i>	Monterey pine
<i>Myoporum laetum</i>	lollypop tree
<i>Escallonia</i> sp.	Escallonia
<i>Kniphofia uvaria</i>	red hot poker
<i>Tropaeolum majus</i>	garden nasturtium
<i>Cotoneaster</i> spp.	cotoneaster
Category 3: Ongoing Management – Removal to greatest extent feasible	
<i>Conium maculatum</i>	poison hemlock
<i>Vinca</i> spp.	periwinkle
<i>Cirsium vulgare</i>	bull thistle
<i>Raphanus sativus</i>	wild radish
<i>Dipsacus</i> spp.	teasel
<i>Medicago</i> spp.	burclover
<i>Hypericum calycinum</i>	Aaron's beard
<i>Mentha pulegium</i>	pennyroyal

<i>Crocosmia xcrocosmiiflora</i>	monbretia
<i>Agrostis</i> spp.	bentgrass
<i>Anthoxanthum odoratum</i>	sweet vernal grass
<i>Briza maxima</i>	rattlesnake grass
<i>Bromus diandrus</i>	ripgut brome
<i>Dactylis glomerata</i>	orchard grass
<i>Festuca perennis</i>	ryegrass
<i>Holcus lanatus</i>	common velvetgrass
<i>Rytidosperma penicillatum</i>	purple-awned wallaby grass

6.4. Establish Native Plants to Increase Native Coverage and Biodiversity

Removal of non-native plants from the wetland and buffer areas will result in disturbed bare soil. Elimination of invasives may be more successful if disturbed soils are immediately watered and allowed to rest for two to three weeks. This will encourage seeds in the soil to sprout. Two to three weeks later non-native seedlings should be eliminated with a hoe. Once seedlings are eliminated, areas with barren soil should be immediately planted and seeded with native plants. Allowing disturbed soils to rest for two to three weeks prior to planting as described is recommended but may not always be practical depending on the time of year activities occur.

In some cases plant removal will need to occur at different times of the year than plant installations depending upon the best strategy against target non-native plants. Generally, the best time to install new plants will be in the fall when rains begin, in order to minimize the necessity for watering and to maximize plant survival.

Table 2 is a list of appropriate native plants for the habitat present within the wetland and surrounding buffer. Many of the plants are already present within the wetland; others are suggested additions to the wetland and/or buffer areas. Adding additional species to those present will increase biodiversity of plants as well as wildlife that utilize these plants as food, cover, nesting materials, etc. The table includes information on the average maximum height and preferred moisture gradient of the plants, as well as the zones denoted in the planting map (**Figure 11**) where each species is appropriate. The list also denotes with an asterisk, those plants that were not documented on the site during previous surveys. This list can be used to determine which plants are new to the site for purposes of increasing species richness, which is one of the criteria for success.

Table 2. Site appropriate plants for the wetland and buffer area. Plants marked with an asterisk* were not documented during the initial surveys but are native and appropriate to the habitat present. Addition of these species would count toward increasing site biodiversity. Average height was determined based on biologist's knowledge of and familiarity with these species in comparable habitats on the Mendocino Coast.

Scientific name	Common name	Average Height (feet)	Wetland Status	Planting Zones
<i>Erythranthe guttata</i>	seep monkeyflower	1.5	OBL	C
<i>Erythranthe inodora</i> *	musk monkeyflower	0.1	OBL	C
<i>Juncus bolanderi</i> *	Bolander's rush	1.7	OBL	C
<i>Carex obnupta</i>	slough sedge	2	OBL	C
<i>Carex harfordii</i>	Monterey sedge	1.5	OBL	C
<i>Scirpus microcarpus</i>	small paniced bulrush	2	OBL	C
<i>Potentilla anserina ssp. pacifica</i>	Pacific potentilla	0.1	OBL	C, E
<i>Rhododendron columbianum</i> *	Labrador tea	4.5	OBL	D
<i>Equisetum telmatia</i>	giant horsetail	3	FACW	C
<i>Camassia quamash</i> *	Camas lily	1.7	FACW	E
<i>Grindelia stricta</i> *	gumweed	2	FACW	E, F
<i>Stachys chamissonis</i>	coast hedge-nettle	1	FACW	C
<i>Calamagrostis nutkaensis</i> *	Pacific reedgrass	2.5	FACW	E, F
<i>Artemesia douglasiana</i> *	California mugwort	3	FACW	B, D
<i>Plantago subnuda</i>	naked plantain	0.3	FACW	C, E
<i>Juncus breweri</i>	Brewer's rush	1	FACW	C
<i>Juncus hesperius</i> *	coast rush	1	FACW	C, F
<i>Sisyrinchium californicum</i> *	golden-eyed grass	0.5	FACW	C
<i>Deschampsia cespitosa ssp. holciformis</i>	coastal tufted hairgrass	0.3	FACW	E
<i>Juncus patens</i> *	spreading rush	1.5	FACW	E
<i>Lilium maritimum</i> *	coast lily	3	FACW	E, F
<i>Morella californica</i>	wax myrtle	10	FACW	D
<i>Stachys rigida</i>	hedge nettle	1.2	FACW	E
<i>Grindelia stricta</i>	coastal gumweed	2	FACW	E
<i>Sisyrinchium bellum</i>	blue-eyed grass	0.5	FACW	E
<i>Hosackia gracilis</i>	coastal lotus	0.1	FACW	E
<i>Rosa nutkana var. nutkana</i>	Nootka rose	3.5	FAC	B
<i>Heracleum lanatum</i>	cow parsnip	3.5	FAC	D, F
<i>Scrophularia californica</i>	California bee plant	2	FAC	F
<i>Athyrium filix-femina</i> *	lady fern	2	FAC	E, F
<i>Danthonia californica</i> *	California oatgrass	1.3	FAC	B
<i>Elymus glaucus</i>	blue wildrye	2	FACU	B
<i>Carex tumulicola</i> *	split awn sedge	0.5	FACU	F
<i>Ribes sanguineum</i> *	pink flowering current	6	FACU	B, D
<i>Vaccinium ovatum</i> *	evergreen huckleberry	5	FACU	B, D
<i>Prunella vulgaris</i>	self-heal	0.3	FACU	F
<i>Fragaria chiloensis</i>	beach strawberry	0.1	FACU	F
<i>Erigeron glaucus</i>	seaside daisy	0.2	FACU	F
<i>Achillea millefolium</i>	yarrow	1	FACU	F
<i>Artemesia suksdorfii</i> *	coastal mugwort	3	FACU	B, D
<i>Polystichum munitum</i>	western sword fern	2.5	FACU	B, D
<i>Solidago canadensis</i>	Canadian goldenrod	2	FACU	B, F
<i>Solidago spathulata</i>	coast goldenrod	0.5	FACU	B, F
<i>Chamerion angustifolium</i>	fireweed	1	FACU	F
<i>Anaphalis margaritacea</i>	pearly everlasting	1	FACU	B, F
<i>Iris douglasiana</i>	Douglas iris	1.5	UPL	B, F
<i>Marah oreganus</i>	wild cucumber	3	UPL	B
<i>Baccharis pilularis</i>	coyote brush	5	UPL	B
<i>Frangula californica</i> *	California coffeeberry	5	UPL	D
<i>Bromus carinatus</i>	California brome	2	UPL	B, D

Treatment: A=preservation, B=soil amendment, C=wetland restoration, D=buffer enhancement (shrubs), E=spillway (low plants), F=buffer enhancement (low plants)

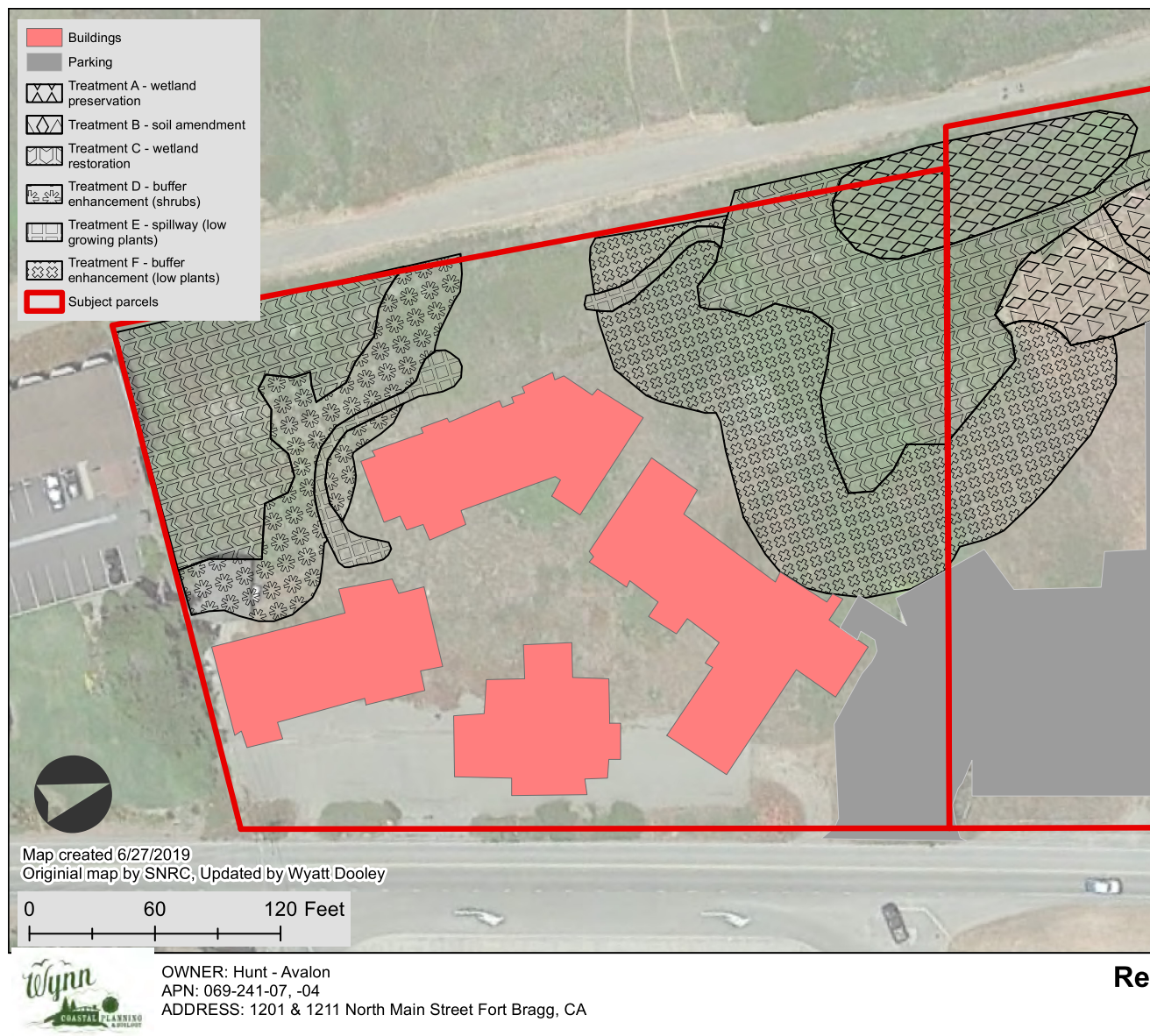


Figure 11. Restoration Planting Map, illustrating various Treatment Areas keyed to Table 2 Species List

6.5. Establish Native Plants to Provide Screening

In some locations it may be desirable to plant shrubs within the wetland buffer between the development and the wetland. Shrubs will help reduce entry into the wetland by guests and will screen the wetland from noise, nighttime light, and visual disturbance. These functions will provide better conditions for wildlife using the wetland areas. A line of wax myrtle shrubs (**Figure 12**), presumably shaped by wind and salt spray, occurs along a portion of the eastern edge to the northern wetland. This hedge provides a good model of what can be created in the other target areas within the wetland buffer. Concerns over public view of the ocean from the highway may preclude the installation of a hedge along the remainder of the northern wetland. The view of the ocean from the highway over portions of the northern wetland, and the southern wetland, however, will already be blocked by proposed development. In these areas native shrubs should be planted along the outside (eastern) edge of the buffer area. Care will be taken to ensure that first-floor guests are afforded a view of the ocean. Probably the most likely shrub species to successfully become established will be wax myrtle (*Morella californica*). For variety and biodiversity some additional evergreen shrub species can be substituted including coyote brush (*Baccharis pilularis*), evergreen huckleberry (*Vaccinium ovatum*), California coffeeberry (*Frangula californica*), or Labrador tea (*Rhododendron columbianum*). Sword fern (*Polystichum munitum*) may also be used in some locations.



Figure 12. Hedge of wax myrtle along the edge of the northern wetland that performs a screening function protecting the wetland habitat beyond.

6.6. Project Adaptation

Using the annual monitoring procedure, active management components will be assessed based upon the performance goals. If the performance goals are not being achieved or if there is evidence that they are vulnerable to failure, a consultation with CA Department of Fish and Wildlife should occur where criteria may be reassessed based upon current and projected conditions.

6.7. Monitoring

An active management monitoring report will be written on an annual basis, for a minimum of five years, and until most or all performance goals have been met for three consecutive years. The report will describe the methods used during that monitoring period to eradicate weeds, improve wetland quality and conditions develop and maintain wetland buffer vegetation and functionality. Any new invasive plant species observed will be described. Barriers to achieving the performance goals should be identified, described, and strategies to overcome these barriers shall be developed and implemented. Pictures will be included, and a description of whether and how performance goals were met will be noted.

7. SCHEDULE

The table below gives an approximate outline of when in the life of the project each component of the restoration plan should be undertaken.

Table 3. Restoration plan implementation schedule

Phase	Implementation Date	Description
Phase 1 - Site Grading and Restoration		
Establish photo points	Before other activities	Establish photo points for northern wetland, northern wetland buffer area, southern wetland, and southern wetland buffer area. Record baseline conditions.
Contour topography	Fall, Year 1	Contour topography for 2 emergency spillways and swale (Area E)
Loosen and amend compacted soils	Fall, Year 1	Upper layer of soil in Area B should be ripped and amended
Begin invasive plant removal	Year 1	Begin removing invasive plants in Areas B - F. Category 1 plants should be targeted for removal. Category 2 plants should be removed to a feasible extent (Table 1)
Recommended - germinate seed bank	Year 1	After soils are disturbed and barren of vegetation, soil should be watered sufficiently to allow present seed bank to germinate. Two to three weeks later seedlings should be eliminated with a hoe.
Plant and seed natives in barren soil	Year 1	After the above recommended step or immediately after soil is barren, barren areas should be planted and seeded with natives. If this occurs during the dry portion of the year watering should occur until rains are sufficient.
Establish screening plants	Winter, Year 1	Shrubs should be planted in Area D. If this occurs during the dry portion of the year watering should occur until rains are sufficient.
Establish low growing plants	Winter, Year 1	Low growing plants should be planted and established in Area E. If this occurs during the dry portion of the year watering should occur until rains are sufficient
Document efforts	Winter, Year 1	Document restoration efforts through photographs, number and location of plants installed, record qualitative and quantitative data for each success criteria.
Phase 2 – Maintenance and Documentation		
Site monitoring	Quarterly, Year 2-5+	Document restoration efforts through photographs, number and location of plants installed, record qualitative and quantitative data for each success criteria.
Yearly reporting	Winter, Year 2-5+	Provide all documentation recorded in quarterly monitoring to the appropriate authority as discussed in the reporting section below.
Supplemental invasive removal	Quarterly, Year 2-5+	Remove resprouting invasive plants in Areas B-F.
Supplemental native planting	Winter, Year 2-5+	Seed and install native plants as necessary to achieve success criteria
Final Report	Winter, Year 5+	Write and submit a final report when success criteria have been achieved and maintained. If success criteria have not been achieved at the end of the 5 th year then the restoration efforts shall continue until these criteria are met. If it becomes apparent that some criteria will not be met then coordination with City Planning shall occur to determine how criteria can be met and/or to re-assess what goals must be achieved for the restoration to be considered successful.

8. REPORTING

Reporting will occur on an annual basis, and reports will be received by the City of Fort Bragg Planning Department by December 31 of each year until all (or most with agency consultation) performance goals have been met for at least three consecutive years.

Reports will be sent by US Mail to:

Attn: Sarah McCormick, Assistant Planner
Community Development Department
City of Fort Bragg
416 North Franklin Street
Fort Bragg, CA 95437

Reports will include the following information:

- Name and contact information of person in charge of monitoring activities, and name and contact information of reporting party.
- Evaluation of each of the performance criterion; along with recommendations for meeting each of the criterion not already met.
- Color photos of the active management areas, from each photo point, each quarter of the reporting period.
- A summary of any issues encountered and management steps taken during the reporting period.
- Methods used during that monitoring period to eradicate weeds, improve wetland and buffer quality.
- Any new invasive plant species observed or evidence of other potential problems will be described.

9. REFERENCES

- Biebighauser, Tom. Wetland Restoration and Construction - A Technical Guide. China: Upper Susquehanna Coalition, 2011. Print.
- Bossard, C. C., Randall, J. M., & Hoshovsky, M. C. (2000). Invasive plants of California's wildlands. Berkeley: University of California Press.
- California Coastal Commission. Procedural Guidance for Evaluating Wetland Mitigation Projects in California's Coastal Zone. California Coastal Commission, 1995. Web. 30 JAN 2013
<http://www.coastal.ca.gov/weteval/wetitle.html>
- California Department of Fish and Wildlife (CDFW). California Salmonid Stream Habitat Restoration Manual Volume II, Part XI: Riparian Habitat Restoration. CDFW 2004.
- Lichvar, R.W. The National Wetland Plant List. ERDC/CRREL TR-12-11. Hanover, NH: U.S. Army, 2012. Web. 30 JAN 2013.
http://rsgisias.crrel.usace.army.mil/NWPL/doc/plant_lists/Regions/pdf/WMVC_2012v1.pdf
- Munsell Color Company. Munsell Soil Color Charts. New Windsor, New York: GretagMacbeth, 2000. Print.
- Natural Resource Conservation Service. Web Soil Survey. Natural Resource Conservation Service, 2012. Web. 30 JAN 2013 < <http://www.soils.usda.gov/survey>>
- Environmental Laboratory. Corps of Engineers Wetlands Delineation Manual. Waterways Experiment Station Technical Report Y-87-1. United States Army Corps of Engineers, 1987. Print.
- Sawyer, J. O., Keeler-Wolf, T., & Evens, J. (2009). *A Manual of California Vegetation*. Sacramento, CA: California Native Plant Society Press.
- United States Army Corps of Engineers. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast 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, 2010.

10. INVESTIGATOR BIOGRAPHIES

Contributing Biologists

Asa B Spade graduated from Humboldt State University with a Bachelor's Degree in Environmental Science, with a concentration in Landscape Ecosystems as well as a minor in Botany. Since that time, he has been working in the natural resources field, first with Mendocino County Environmental Health and later with California State Parks and the Department of Fish and Game. He has been trained in Army Corps wetland delineation by the Coastal Training Program at Elkhorn Slough and in Advanced Wetland Delineation by the Wetland Science and Coastal Training Program. He has been trained in the environmental compliance process for wetland projects in San Francisco bay and outer coastal areas. Asa has trained with the Carex Working Group in identifying grasses and sedges of Northern California. He is on the Fish and Wildlife Service approved list for Point Arena mountain beaver surveys and has done surveys for Behren's silverspot butterfly, Northern spotted owl, Sonoma tree vole, and the California red-legged frog. He has contributed to more than 150 coastal development projects in Mendocino County.