County of Santa Cruz

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131
KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR
www.sccoplanning.com

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

NOTICE OF PUBLIC REVIEW AND COMMENT PERIOD

Pursuant to the California Environmental Quality Act, the following project has been reviewed by the County Environmental Coordinator to determine if it has a potential to create significant impacts to the environment and, if so, how such impacts could be solved. A Negative Declaration is prepared in cases where the project is determined not to have any significant environmental impacts. Either a Mitigated Negative Declaration or Environmental Impact Report (EIR) is prepared for projects that may result in a significant impact to the environment.

Public review periods are provided for these Environmental Determinations according to the requirements of the County Environmental Review Guidelines. The environmental document is available for review at the County Planning Department located at 701 Ocean Street, in Santa Cruz. You may also view the environmental document on the web at www.sccoplanning.com under the Planning Department menu. If you have questions or comments about this Notice of Intent, please contact Matt Johnston of the Environmental Review staff at (831) 454-3201

The County of Santa Cruz does not discriminate on the basis of disability, and no person shall, by reason of a disability, be denied the benefits of its services, programs or activities. If you require special assistance in order to review this information, please contact Bernice Shawver at (831) 454-3137 to make arrangements.

PROJECT: Bryant-Habert/Wait Ecological Restoration Project
APP #: 141216
APN(S): 052-221-25

PROJECT DESCRIPTION: The proposed project proposes to protect, expand, and enhance plant and wildlife habitat conditions favorable to wetland and riparian dependent species and adjacent upland habitat at the Struve/Watsonville Slough. The project includes 11,350 cubic yards of cut with a corresponding fill. The project requires a Coastal Development Permit (141216), Riparian Exception, Biotic Report Review (REV141099), Hydrological Report Review (REV141100), Preliminary Grading Approval, and Environmental Review. Figure 2 provides the Vegetation Management Plan showing the proposed restoration design.

PROJECT LOCATION: The proposed project is located on the west side of Highway 1 north of West Beach Street within the San Andreas Planning Area in the unincorporated County of Santa Cruz (see Figure 1, Location Map). The project is bounded on the south by the Santa Cruz Branch Rail Line and on the north by the Struve/Watsonville Slough.

EXISTING ZONE DISTRICT: CA
APPLICANT: Land Trust of Santa Cruz County
OWNER: Land Trust of Santa Cruz County
PROJECT PLANNER: Todd Sexauer
EMAIL: Todd.Sexauer@santacruzcounty.us
ACTION: Negative Declaration with Mitigations
REVIEW PERIOD: January 21, 2016 through February 19, 2016

This project will be considered at a public hearing by the Planning Commission. The time, date and location have not been set. When scheduling does occur, these items will be included in all public hearing notices for the project.

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MITIGATED NEGATIVE DECLARATION

Project: Bryant-Habert/Wait Ecological Restoration Project **APPLICATION #: 141216**

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Owner: Land Trust of Santa Cruz County

Applicant: Land Trust of Santa Cruz County

Staff Planner: Bob Loveland

Email: Bob.Loveland@santacruzcounty.us

This project will be considered at a public hearing by the Planning Commission. The date, time and location have not yet been determined. When scheduling does occur, these items will be included in all public hearing notices for the project.

California Environmental Quality Act Mitigated Negative Declaration Findings:

Find, that this Mitigated Negative Declaration reflects the decision-making body's independent judgment and analysis, and; that the decision-making body has reviewed and considered the information contained in this Mitigated Negative Declaration and the comments received during the public review period; and, that revisions in the project plans or proposals made by or agreed to by the project applicant would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur; and, on the basis of the whole record before the decision-making body (including this Mitigated Negative Declaration) that there is no substantial evidence that the project as revised will have a significant effect on the environment. The expected environmental impacts of the project are documented in the attached Initial Study on file with the County of Santa Cruz Clerk of the Board located at 701 Ocean Street, 5th Floor, Santa Cruz, California.

Review Period Ends: February 19, 2016

Date: _____

_____
TODD SEXAUER, Environmental Coordinator
(831) 454-3511

County of Santa Cruz

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR
www.sccoplanning.com

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)
INITIAL STUDY/ENVIRONMENTAL CHECKLIST

Date: January 19, 2016 **Application Number:** 141216

Project Name: Bryant-Habert/Wait Ecological Restoration Project **Staff Planner:** Todd Sexauer

I. OVERVIEW AND ENVIRONMENTAL DETERMINATION

APPLICANT: Land Trust of Santa Cruz County **APN(s):** 052-221-25

OWNER: Land Trust of Santa Cruz County **SUPERVISORAL DISTRICT:** 2

PROJECT LOCATION: The proposed project is located on the west side of Highway 1 north of West Beach Street within the San Andreas Planning Area in the unincorporated County of Santa Cruz (see Figure 1, Location Map). The project is bounded on the south by the Santa Cruz Branch Rail Line and on the north by the Struve/Watsonville Slough. The County of Santa Cruz is bounded on the north by San Mateo County, on the south by Monterey and San Benito counties, on the east by Santa Clara County, and on the south and west by the Monterey Bay and the Pacific Ocean.

SUMMARY PROJECT DESCRIPTION: The project proposes to protect, expand, and enhance plant and wildlife habitat conditions favorable to wetland and riparian dependent species and adjacent upland habitat at the Struve/Watsonville Slough. The project includes 11,350 cubic yards of cut with a corresponding fill. The project requires a Coastal Development Permit (141216), Riparian Exception, Biotic Report Review (REV141099), Hydrological Report Review (REV141100), Preliminary Grading Approval, and Environmental Review. Figure 2 provides the Vegetation Management Plan showing the proposed restoration design.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: *All of the following potential environmental impacts are evaluated in this Initial Study. Categories that are marked have been analyzed in greater detail based on project specific information.*

- ☐ Aesthetics and Visual Resources
- ☒ Agriculture and Forestry Resources
- ☒ Air Quality
- ☒ Biological Resources
- ☒ Cultural Resources
- ☒ Geology and Soils
- ☐ Land Use and Planning
- ☐ Mineral Resources
- ☐ Noise
- ☐ Population and Housing
- ☐ Public Services
- ☐ Recreation

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: *All of the following potential environmental impacts are evaluated in this Initial Study. Categories that are marked have been analyzed in greater detail based on project specific information.*

- ☐ Greenhouse Gas Emissions
- ☐ Hazards and Hazardous Materials
- ☒ Hydrology/Water Supply/Water Quality
- ☐ Transportation/Traffic
- ☐ Utilities and Service Systems
- ☐ Mandatory Findings of Significance

DISCRETIONARY APPROVAL(S) BEING CONSIDERED:

- ☐ General Plan Amendment
- ☐ Land Division
- ☐ Rezoning
- ☐ Development Permit
- ☐ Sewer Connection Permit
- ☒ Coastal Development Permit
- ☒ Grading Permit
- ☒ Riparian Exception
- ☐ LAFCO Annexation
- ☐ Other:

OTHER PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED (e.g., permits, financing approval, or participation agreement):

Permit Type/Action	Agency
• 1602 Lake and Streambed Alteration Agreement	California Department of Fish and Wildlife
• Section 404 Permit	U.S. Army Corps of Engineers
• Section 401Water Quality Certification	Regional Water Quality Control Board
• Coastal Development Permit (LCP)	California Coastal Commission (via LCP)
• Section 7 Consultation and B.O.	U.S. Fish and Wildlife Service

DETERMINATION:

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

TODD SEXAUER, Environmental Coordinator

Date 1/20/16

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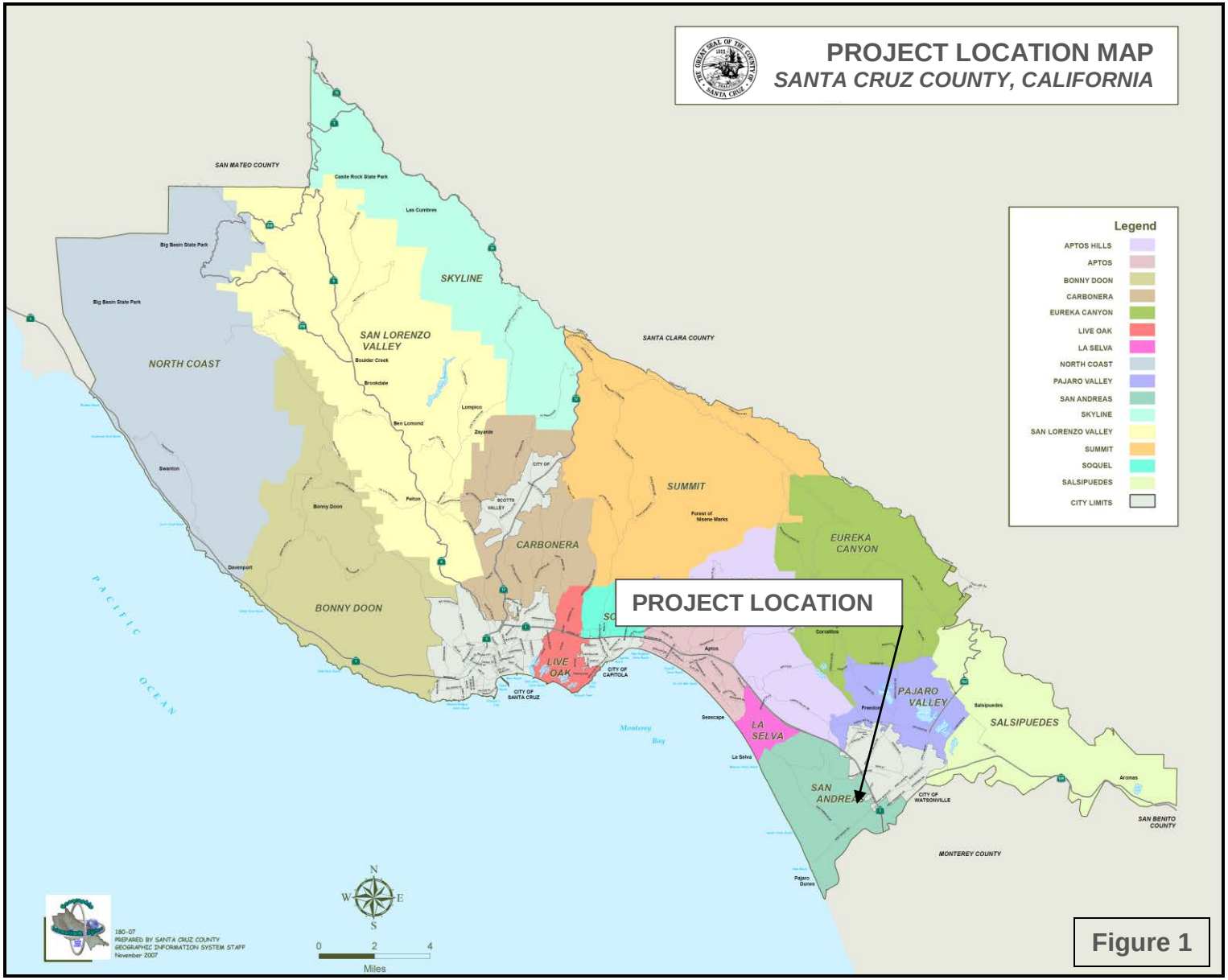
PROJECT LOCATION MAP
SANTA CRUZ COUNTY, CALIFORNIA
Legend
APTOS HILLS
APTOS
BONNY DOON
CARBONERA
EUREKA CANYON
LIVE OAK
LA SELVA
NORTH COAST
PAJARO VALLEY
SAN ANDREAS
SKYLINE
SAN LORENZO VALLEY
SUMMIT
SOQUEL
SALSIPUEDES
CITY LIMITS
PROJECT LOCATION
SAN MATEO COUNTY
SANTA CLARA COUNTY
MONTEREY COUNTY
SAN BENITO COUNTY
NORTH COAST
SKYLINE
SAN LORENZO VALLEY
SUMMIT
CARBONERA
EUREKA CANYON
BONNY DOON
LIVE OAK
PAJARO VALLEY
LA SELVA
SALSIPUEDES
SAN ANDREAS
PACIFIC OCEAN
Monterey Bay
Big Basin State Park
Castle Rock State Park
Las Cumbres
Boulder Creek
Brookdale
Lompico
Ben Lomond
Zayante
Swanton
Bonny Doon
Felton
Davenport
Forest of Nisene Marks
Corralitos
Aptos
Seascape
Freedom
Salsipuedes
Aromas
La Selva
CITY OF SCOTTS VALLEY
CITY OF CAPITOLA
CITY OF SANTA CRUZ
CITY OF WATSONVILLE
Pajaro Dunes
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Miles
180-07
PREPARED BY SANTA CRUZ COUNTY
GEOGRAPHIC INFORMATION SYSTEM STAFF
November 2007
Figure 1

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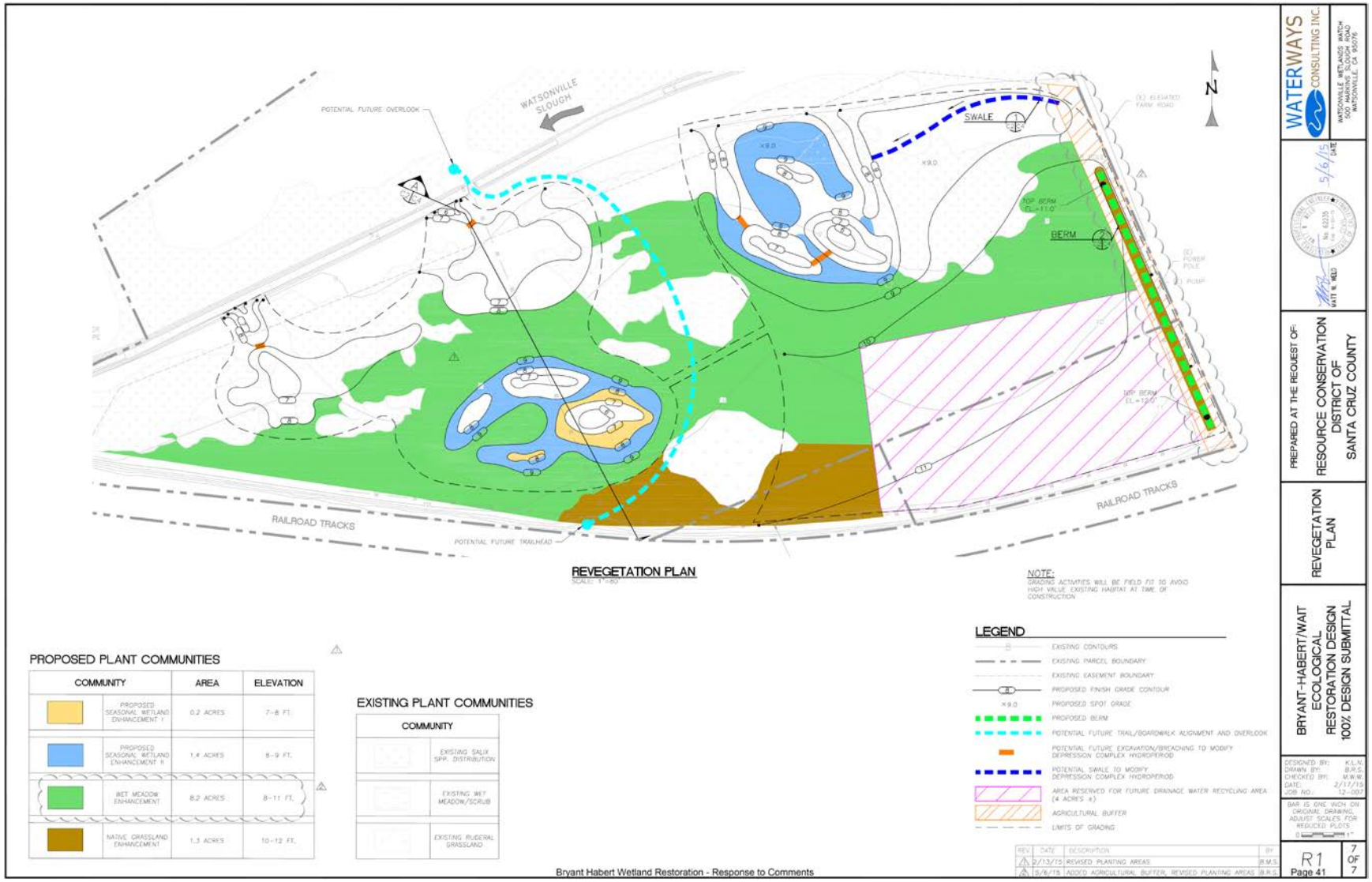

Figure 2 - Revegetation Plan

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II. BACKGROUND INFORMATION

EXISTING SITE CONDITIONS:

Parcel Size (acres):	46.28
Existing Land Use:	Fallow Agricultural Land
Vegetation:	Ruderal and Riparian Vegetation
Slope in area affected by project:	☒ 0 - 30% ☐ 31 – 100% ☐ N/A
Nearby Watercourse:	Struve/Watsonville Slough
Distance To:	Crosses the northern portion of the site.

ENVIRONMENTAL RESOURCES AND CONSTRAINTS:

Water Supply Watershed:	No	Fault Zone:	No
Groundwater Recharge:	No	Scenic Corridor:	Yes
Timber or Mineral:	No	Historic:	No
Agricultural Resource:	Yes	Archaeology:	Yes/Partial
Biologically Sensitive Habitat:	Yes	Noise Constraint:	No
Fire Hazard:	No	Electric Power Lines:	Yes
Floodplain:	Yes	Solar Access:	Yes
Erosion:	No	Solar Orientation:	N/A
Landslide:	No	Hazardous Materials:	No
Liquefaction:	Yes	Other:	

SERVICES:

Fire Protection:	CRZ-FSA48	Drainage District:	Zone 7
School District:	PVUSD	Project Access:	Yes
Sewage Disposal:	CSA-12	Water Supply:	N/A

PLANNING POLICIES:

Zone District:	CA	Special Designation:	
General Plan:	AG		
Urban Services Line:	☐ Inside	☒ Outside	
Coastal Zone:	☒ Inside	☐ Outside	

ENVIRONMENTAL SETTING AND SURROUNDING LAND USES:

Natural Environment

Santa Cruz County is uniquely situated along the northern end of Monterey Bay approximately 55 miles south of the City of San Francisco along the Central Coast. The Pacific Ocean and Monterey Bay to the west and south, the mountains inland, and the prime agricultural lands along both the northern and southern coast of the county create limitations on the style and amount of building that can take place. Simultaneously, these natural features create an environment that attracts both visitors and new residents every

year. The natural landscape provides the basic features that set Santa Cruz apart from the surrounding counties and require specific accommodations to ensure building is done in a safe, responsible and environmentally respectful manner.

The California Coastal Zone affects nearly one third of the land in the urbanized area of the unincorporated County with special restrictions, regulations, and processing procedures required for development within that area. Steep hillsides require extensive review and engineering to ensure that slopes remain stable, buildings are safe, and water quality is not impacted by increased erosion. The farmland in Santa Cruz County is among the best in the world, and the agriculture industry is a primary economic generator for the County. Preserving this industry in the face of population growth requires that soils best suited to commercial agriculture remain active in crop production rather than converting to other land uses.

PROJECT BACKGROUND:

The Watsonville Slough Farms Plan Technical Advisory Committee (TAC) provided review and input on design of the proposed project. This committee includes members from the following organizations: Resource Conservation District of Santa Cruz County (RCDSCC); Land Trust; USFWS; U.S.D.A Natural Resources Conservation Service (NRCS); Waterways Consulting, Inc.; State Coastal Conservancy; Watsonville Wetlands Watch; California Department of Fish and Wildlife; County of Santa Cruz Public Works Department; City of Watsonville; California Coastal Commission; Central Coastal Wetlands Group; Alnus Ecological; Kittleson Environmental Consulting; and local farmers. The design team for the proposed project includes the Land Trust, RCDSCC, Alnus Ecological, Watsonville Wetlands Watch and Waterways Consulting, Inc. The project proponents include RCDSCC, Land Trust, USFWS and NRCS and the CEQA lead agency for the proposed project is the County of Santa Cruz (County).

During the project design meetings, members of the TAC agreed to preserve and protect areas with desirable vegetation and avoid creation of perennial open water, which support the non-native and predatory American bullfrog (*Rana catesbeiana*). Desirable vegetation is defined by concentrations of native plants or non-native, non-invasive plants located within the project site. These areas have been mapped and would be re-mapped prior to proposed restoration activities. Restoration activities are located outside of the extent of desirable vegetation as to retain stands of native plant species or preferred non-native plants. In addition, seasonal wetland, low seasonal marsh, high seasonal marsh, and willow scrub habitat areas would be largely preserved during implementation of the restoration elements.

In March of 2014, Waterways Consulting, Inc. (Waterways) prepared the Bryant-Habert/ Wait Ecological Design Report (60%; see Attachment 2). In this report, Waterways provides design drawings for the "Preferred Design Alternative" or the "proposed project." Watsonville Wetlands Watch prepared the Draft Bryant-Habert Property Vegetation

Management Plan, 100%, dated March 2015 (Attachment 3). The contents of these two plans are summarized below.

DETAILED PROJECT DESCRIPTION:

The proposed project would preserve and expand existing wet meadow habitat through balanced grading - to create depressions, swales and berms - and implementation of a Vegetation Management Plan (Figure 2). Of note, four acres of upland ruderal habitat have been set aside in the southeast corner of the site to be retained for future drainage water recycling, which is not a component of the proposed project.

Balanced Grading

The first element of the proposed project includes grading four "depression complexes" of variable size, shape and depth. Depressions would have a minimum elevation of six feet and maximum depths of approximately four feet below natural grade. These elevations would allow each depression to completely drain or dry down during average rainfall years. The depressions would also have variable topography and gentle gradients (10:1 maximum slope). The use of a high-resolution digital elevation model (DEM) and high frequency stage data has allowed for a constructed wetlands feasibility analysis under the current conditions and with future expectations of sea level rise and climate change. Both the size and depth of disturbance have been evaluated with the model as well as local data on seasonal shallow groundwater levels and these data have guided design of the proposed project.

The grading plan shows a total cut volume of approximately 11,350 cubic yards, with a corresponding fill. These numbers reflect neat line quantities and have not been factored to reflect compaction or shrinkage. Where peat soils are encountered, compaction may be significant. The grading plan design incorporates flexibility to accommodate such variation by placing a significant percentage of this excess material within areas that are not critical to the function of the project (e.g., the southeast corner of the parcel). The design drawings are representative of the maximum potential volume of grading that may occur.

All work would be located above the anticipated slough water level at the time of construction - thereby avoiding challenges related to dewatering or erosion and sediment control. The majority of the proposed work areas are internally drained, which greatly facilitates dewatering and erosion/sediment control. The contractor would be required to comply with all environmental protection measures contained in the project specifications and permit conditions, including preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP). Construction would take place during mid-summer to early fall when the surface inundation and groundwater elevations are at a minimum. Discharge of water encountered in the excavations would be performed in a manner that prevents excessive turbidity from discharging into the slough channel. If pumping of groundwater is required, pumped water would be treated by filtration or retention, as necessary to meet water quality requirements.

As required by the Monterey Bay Unified Air Pollution Control District (MBUAPCD), construction activities (e.g., excavation, grading, on-site vehicles) which directly generate 82 pounds per day or more of PM_{10} would have a significant impact on local air quality when they are located nearby and upwind of sensitive receptors. Although the proposed project would ultimately grade up to 46 acres within the project area, it would actively grade no more than 2.2 acres per day to maintain consistency with the MBUAPCD 2008 CEQA Guidelines. Construction projects below the screening level of 2.2 acres per day are assumed to be below the 82 pounds per day or more of PM_{10} threshold of significance.

Vegetation Management Plan

The Vegetation Management Plan for the proposed project includes restoration and enhancement of seasonal wetland habitat, wet meadow habitat, native grassland habitat, and enhancement of existing stands of desirable vegetation. As mentioned above, desirable vegetation is defined by concentrations of native plants or non-native, non-invasive plants located within the project site. All vegetation on the project site was mapped in 2012 and would be re-mapped prior to implementation of the project.

Implementation of the Vegetation Management Plan would consist of three discrete construction phases:

- Site preparation, additional management measures to prepare the area prior to grading and planting;
- Establishment, includes active planting, seeding and transplanting and optional management measures such as irrigation; and
- Monitoring, maintenance and adaptive management, includes monitoring for Performance Standards and implementation of maintenance activities such as mowing and herbicide applications.

Site Preparation

The site is currently managed with annual discing, mowing, habitat preservation, and invasive plant management; however, additional site preparation activities would be required to ensure the successful establishment of plant material and to prohibit the establishment of high and moderate priority invasive plant species. For the purposes of this project, invasive plant species have been divided into high priority and moderate priority species. High priority species, such as jubata grass (*Cortaderia jubata*) or acacia (*Acacia* sp.), would continue to be removed regularly as they would have a detrimental effect on the habitat and would colonize substantial acreage on the site quickly. Moderate priority species are those which either currently exist on the site or are known to exist in relatively close proximity to the site and could have a detrimental impact on re-vegetation efforts, habitat quality, or surrounding land uses such as agriculture or conservation. Moderate priority species are those that are not known to colonize and out-compete native plants to the same degree as high priority species. Each species with a moderate ranking would be evaluated for control

over time, and new priority species would be evaluated in coordination with surrounding land managers and growers in the region, and the California Invasive plant council published lists (http://www.cal-ipc.org/paf/).

In preparation of grading and planting seeds or transplants, the site would be surveyed for native and desirable plant populations. These areas would be preserved and the remainder of the site would be disced to reduce compaction and provide a proper seed bed for seed germination and transplanting. Additional soil preparation activities could include shallow ripping, chiseling, and ring rolling to provide proper soil structure and surface consolidation. Additional cultivation activities prior to seeding or transplanting may involve other implements such as flex-tine cultivators and finger-tine cultivators in order to reduce competition by non-native weeds. In areas where transplanting of container stock would occur, site preparation of greater intensity during the final cultivation would likely be required to facilitate use of mechanical transplant equipment, depending on site conditions.

Establishment

Establishment would involve the enhancement of three vegetation communities: seasonal marsh habitat, wet meadow habitat and native grassland habitat. The Vegetation Management Plan (Attachment 3) provides details on establishment of these three communities, which are summarized below.

Seasonal Marsh: Seasonal marsh enhancement would be conducted in approximately 0.2 acres between 7 and 8 feet elevation (NAVD88) and 1.4 acres between 8 and 9 feet in elevation in areas which have been graded to lower the surface elevation as described in the grading plan. Most of the areas graded to between 7 and 8 feet in elevation are likely to receive surface floodwaters from the main slough channel, and it is expected that water borne native plant seed would establish in those areas without planting, as has been seen in other similar areas on the property in the time since the agricultural field has been out of production. Those areas that surface waters are unlikely to reach would be re-vegetated with native plant material. A plant material list is provided in Attachment 3.

Wet Meadow: Wet meadow enhancement is planned for 8 acres within the 8 to 11 foot elevation range and would provide high quality native wet meadow habitat within the existing ruderal wet meadows on site. Many of these areas would be subject to grading. Wet meadow enhancement work would include seeding and/or transplanting with site appropriate native plant material throughout the enhancement area. Seed which requires cold stratification for improved germination would be stratified prior to installation. Quickly colonizing plant species would be planted in a majority of the wet meadow enhancement area.

Native Grassland: Native grassland restoration is planned for 1.3 acres within the 10 to 12 foot elevation range and would be located primarily within areas currently mapped as

ruderal grassland habitat. These areas would also be disturbed by grading activities. Native grassland enhancement work would include seeding and/or transplanting with site appropriate native seed stock throughout the enhancement area. Seed that requires cold stratification for improved germination would be stratified prior to installation.

Factors most likely to contribute to high percent cover of invasive plants species or low percent cover of native plant species after seeding or transplanting include insufficient germination or growth due to problems associated with inadequate site preparation, insufficient germination or growth of seeded plant species due to problems associated with installation efforts, and/or inadequate maintenance during the establishment period, including timing of herbicide use, or the competitive advantage of the invasive species.

Irrigation Contingency

In areas where seeding is used, a normal rainfall year would provide sufficient soil moisture for successful establishment of plant material. However, in the event of a dry year, the project includes an irrigation component, which may be required for areas with young transplants or under drought conditions. If large scale irrigation is needed, then irrigation of container stock may be conducted with sprinklers and/or drip irrigation by pumping groundwater from the well on site, or that of a neighboring farm. A water truck may also be used for irrigation.

Plant Material for Seed and Container Installation

All plant material would be collected from parent material within the Pajaro River watershed or Monterey Bay bioregion to the maximum extent possible. Locally-sourced plant material would be most adapted to on-site conditions in the short-term and provide for long-term resiliency. Plant species were chosen by ecologists for their phenological abilities to self-propagate and spread aggressively by either seed or rhizome, in order to compete with the high presence of undesirable species on site.

Monitoring and Maintenance

Monitoring and maintenance activities would ensure the successful establishment of plant material and prohibit the establishment of high and moderate priority invasive plant species. The active monitoring and maintenance period for this project is anticipated to be two years; however, regulatory permits and authorizations for the proposed project may include active monitoring and reporting for up to 5 years. Adaptive management of the site is expected to last seven years. The long-term monitoring and maintenance costs associated with the project would be low, due to the self-sustaining design and the limited need for intervention.

Proposed maintenance practices include various weeding techniques, mowing, and herbicide application. A broadleaf-specific herbicide would be used to remove invasive forb species and establish native grass cover, if necessary. All maintenance practices would occur outside of areas with surface water inundation and outside of areas with saturated soils. A 50 foot buffer

would be provided to all areas with surface water inundation and saturated soils with most maintenance measures, as specified in Table 1 below (source: Watsonville Wetlands Watch, 2015).

Table 1: Management/Maintenance

	Management and Maintenance Activities							
Constraints (measures to minimize impacts)	**Discing Tilling and Other Cultivation**	**Mowing**	**Tractor Mounted Herbicide Application**	**Manual Herbicide Application Spot Spraying**	**Tractor Mounted Flame Torch Weeding**	**Manual Flame Torch Weeding**	**String Trimming Weed Whacking Brush Cutting**	**Hand Pulling Grubbing**
Occurrence per Year (maximum)	4/year	4/year	2/year	2/year	4/year	No Limit	4/year	No Limit
Qualified biologist monitors area beforehand for CRLF between October 15 and August 15	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Qualified biologist monitors beforehand for Bird Nests Between March 15 and Aug. 15	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avoidance Buffer Around Active Bird Nests	50 Feet	50 Feet	50 Feet	25 Feet	50 Feet	25 Feet	25 Feet	25 Feet
Establish Avoidance Buffer Around Inundated Areas and Saturated Soils	50 Feet	50 Feet	50 Feet	25 Feet	50 Feet	25 Feet	25 Feet	None
Other Measures*	1	2	3	3	-	-	-	-

*Notes:
1 No cultivation for two weeks following a rainfall event of 0.75 inches or greater
2 Minimum mower height of 4 inches
3 Applied per label and Mitigation Measure BIO-5 by a licensed applicator with a marker dye as appropriate to avoid over application

Anticipated maintenance methods are described in more detail below.

Flame-torch Weeding: Flame torch weeding can eliminate dicot species (forbs) while preserving monocot species (grasses) due to the relative position and growth of meristem tissue. Depending on the weather and access to the site, a tractor mounted flame torch weeder or hand torch may be used after early rains for control of broadleaf weeds, such as bristly ox-tongue (*Helmenothica echoides*) and bull thistle (*Circium vulgare*).

Mowing: As most of the plant species planned for planting are perennial, mowing would promote root development over vegetative growth, favoring perennial plants not reliant on annual seed set and reducing mowing needs in subsequent years. Some non-native plants are considered compatible with the goals of the re-vegetation effort, including

non-native annual grasses and non-invasive, non-native forb species. Mowing would be conducted with a tractor mounted mower set 4 to 8 inches above the ground, and would typically be limited to two mowing treatments per year. Weed whacking would be used in lieu of mowing when treatment areas are small in size or inaccessible by mowing equipment, and would also typically be limited to two treatments per year. As described in Table 1 above, work would be conducted outside of the bird nesting season, or in areas determined by a qualified biologist to be clear of nesting birds, to prevent impacts to wildlife.

Herbicide Application: Use of a broadleaf herbicide in conjunction with native grass seeding has been shown to effectively establish high percent cover of native grass species and effectively control undesirable broadleaf weeds. Herbicides may be used for up to two years following planting, with exceptions determined by the adaptive management process described below, and in compliance with all regulatory permits and authorizations.

All herbicides would be applied in strict accordance with the label. As mentioned previously, herbicides used at the site would typically include selective post-emergent herbicides that control broadleaf weeds at a variety of plant growth stages and are approved for use near or over water bodies (though herbicide applications would not occur over or within 50-feet of surface water at any time during the project). Broadleaf herbicides are used to control woody and herbaceous broadleaf plants but are ineffective on grasses. Broad spectrum post-emergent herbicides may also be used.

The proposed project includes up to two treatments per year for the first two years. The application would typically be accomplished using boom spray equipment attached to an ATV or wheeled tractor. Spot-treatments with a hand-wand attached to an ATV or backpack sprayer may be applied in lieu of broadcast treatments if broadleaf plants are not overly competitive or ubiquitous. Spot-treatments would typically utilize a marker dye to reduce the likelihood of repeat applications.

Adaptive Management

Adaptive management of the restoration is necessary to meet project goals and to remain consistent with the Ecosystem Health objective identified in the Plan, to "Protect, expand, and enhance habitat for native plant and wildlife species". To this end, the proposed project includes adaptive management tools that may be implemented over the course of seven years after restoration.

The performance goals identified in the Adaptive Management Plan (Attachment 3) provide a basis for monitoring, evaluation, and determination of subsequent actions. During this period of time, the hydroperiod would be monitored and adaptively managed to verify that constructed depressions dry down completely during low water years (see Table 2). Similarly, monitoring of invasive species and an assessment of their priority rank where

necessary would be conducted to enable management of high and moderate priority species. Finally, monitoring of areas that were not planted may be conducted to compare them to planted areas to determine whether additional plantings would be beneficial.

Similarly, monitoring of invasive species and an assessment of their priority rank where necessary would be conducted to enable management of high and moderate priority species. A detailed flow chart has been developed to allow land managers to respond to a range of possible outcomes at the site (Attachment 3). In general, areas that exceed the percent cover metric for high and moderate priority invasive plant species would be treated by one of the maintenance methods described above to reduce the invasive plant species present. Finally, monitoring of areas that were not planted may be conducted to compare them to planted areas to determine whether additional plantings would be beneficial.

Table 2: Adaptive Management of Constructed Ponds

Decrease Hydroperiod	Increase Hydroperiod
▪ Breach berm in select locations to reduce depression storage volume ▪ Backfill depressions to reduce depth ▪ Construct swale to drain depression towards existing slough channel	▪ Excavate depressions deeper to increase storage volume and the potential for groundwater influence ▪ Construct swale and berm to direct surface runoff towards depression

Source: Waterways 2014.

All adaptive management actions would be conducted in a manner consistent with regulatory permit conditions and County requirement for minimizing impacts to sensitive habitats and species.

Construction Methodology

Work Sequence

Site preparation would occur for 1 to 2 years prior to project implementation. This includes weed management, including discing, mowing, flaming, irrigating and applying herbicides to areas proposed for revegetation. The grading plan would be implemented in phases, allowing for adaptive management over time to meet the project goals and to make small changes based on an on-going understanding of site conditions and external contributing factors.

The following provide a sequential list of the general steps that would be taken to implement the proposed restoration project:

- Material and equipment mobilized to the staging area.
- Property surveyed by a qualified biologist to determine presence of special-status species in the work area. This may include installation of wildlife fencing as required by USFWS.

- Corridors for travel of vehicles and heavy machinery from the access road to the site established. Off-road corridors would be cleared of vegetation with a weed wacker or mower (no additional ground disturbance required).
- Initial erosion and sediment control BMP's installed at staging area and access roads.
- Material and equipment mobilized to project site. A biological monitor would be present to document observable wildlife and assist with clearing wildlife from the pathway of construction vehicles.
- Additional erosion control measures implemented prior to grading, per SWPPP requirements.
- Site disced to reduce soil compaction and provide a proper seed bed in re-vegetation areas. Depression sites cleared and disced to prepare for grading. Existing non-native vegetation removed as necessary.
- Site graded. Swales and berms excavated.
- Marsh/meadow/grassland native plant material reestablished via seeding and/or transplanting. Irrigation as necessary.

Active site monitoring and maintenance would occur for two years. Maintenance activities may include discing, mowing, flaming, irrigating and applying herbicides, as necessary to assure native vegetation reestablishment occurs according to the Vegetation Management Plan (Attachment 3).

Construction Equipment

Balanced Grading

During the balanced grading component of the project, an excavator and dozer would be used to move sediment to appropriate elevations. A tractor (at times two) would be available for discing, plowing, rolling, sowing, mowing, irrigating and applying herbicides as necessary for project implementation. A truck would be used to transport vegetation material on and off site. Low pressure ground equipment would be used in wetland areas to minimize compaction and disturbance of wetland soils.

Establishment

During establishment of vegetation, container stock would be planted once grading activity has ended, directly into the tilled soil and irrigated, if necessary. In the case of container stock installation, the site may be seeded with native seed concurrent with transplanting in order to support greater establishment of desired species. In areas receiving container stock, native seed would be broadcast seeded or drill seeded into well-tilled soil. After seeding, if the seed is broadcast, the site would be ring rolled and lightly compacted again as to provide good seed to soil contact. Container stock would be transplanted either by hand or with mechanized transplanting equipment. For use with agricultural transplant equipment,

maximum container size is anticipated to be 2" x 2" x 2 ½". Container stock may be established with either rain or irrigation. If established with rain, container stock would be planted directly into the tilled soil after the first rains but before significant rains make the site inaccessible. As the site is relatively flat and there is limited erosion potential, container stock installation would be conducted after rains or irrigation have established moisture to the depth of the root zone.

Construction Phasing

Due to the high water table and difficulty of accessing the site once rains begin, site preparation, grading and planting would occur outside the rainy season to the extent practical. Construction of depression complexes would be phased to allow for adaptive management to ensure performance of constructed elements. It is likely that only a portion of the depressions would be built in the first year of construction. The initial work would then be observed over the following few seasons to evaluate performance. These areas would then be adaptively managed, as described above. The remaining work would be completed applying knowledge gained through adaptive management of Phase 1 components.

Construction Personnel and Access

Access to the site by the workers would be along farm roads, primarily via West Beach Street and possibly via Harkins Slough Road. Where necessary, a temporary work corridor would be established by removing vegetation with a weed whacker or mower (no grading or ground disturbance would be required).

Construction and Equipment Staging and Stockpile Area

Construction and equipment staging and stockpiling would take place on an existing upland area located on the southeast corner of the project site adjacent to the railroad tracks that is to be reserved for a future drainage water recycling area. All materials would be stockpiled within the existing flat and previously disturbed area. The downslope perimeter of the staging or stockpile areas would be contained with silt fence to prevent soil erosion. In addition, all equipment and materials would be stored, maintained and refueled in a designated portion of the staging area.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

III. ENVIRONMENTAL REVIEW CHECKLIST

A. AESTHETICS AND VISUAL RESOURCES

Would the project:

1. *Have a substantial adverse effect on a scenic vista?* ☐ ☐ ☐ ☒

Discussion: The project site is located on approximately 46 acres of property covering two parcels formerly owned by the Bryant-Habert and Wait families. The subject parcels are located within a designated scenic corridor as designated in the County's General Plan (1994) near two scenic roadways, Highway 1 and Beach Road. The parcels were farmed up until 2007, at which point regular discing replaced farming. Currently the properties consist of a mosaic of fallow lands, wetland habitat, willows and open water. Adjacent to the project site are agricultural fields and associated structures, roads, and a railroad line. Project implementation would not alter the scenic conditions or substantially change the visual quality of the project site as post-construction conditions would be similar to existing conditions. As a result, no impact would occur from project implementation.

2. *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?* ☐ ☐ ☐ ☒

Discussion: The proposed project site is not visible from Highway 1; and therefore, project construction activities would not impact views from this scenic highway. The site is marginally visible from Beach Road. However, the railroad berm that surrounds the southern boundary of the site would block most of the views. There would be no views of the project site from a designated or eligible State Scenic Highway. Therefore, no impact to scenic resources associated with a State scenic highway would occur.

3. *Substantially degrade the existing visual character or quality of the site and its surroundings?* ☐ ☐ ☐ ☒

Discussion: Visual character of the existing site would change very little after project construction. Wetland restoration activities may improve visual quality of the project site as the site would be restored to historic coastal wetland conditions. Therefore, the proposed project would have no adverse impact on visual character or quality of the site.

4. *Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?* ☐ ☐ ☐ ☒

Discussion: Project construction would occur during the daytime and would not result in

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

a new source of nighttime lighting. No permanent lighting would be installed as a result of the proposed project. There would be no impact as a result of a new source of glare as there would be no structures associated with the wetland restoration project. The proposed project would have a no impact on visual resources from light and glare.

B. AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

1.	*Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?*	☐	☐	☒	☐

Discussion: Proposed project activities would convert 20 acres of Prime Farmland as shown on FMMP maps to a mosaic of wetland and upland habitat. Approximately 17 acres of the property were able to support crops and the number of crops per season declined from 2 to 0 due to chronic flooding, extended inundation, and seasonally high groundwater. Future farming of the land is no longer profitable with the current hydrological conditions and future hydrological conditions (sea-level rise, etc.) further complicate the potential for profitable farming on this property. Conversion of the remaining agricultural habitat to wetland and upland habitat does not constitute an irrevocable loss of this farmland since there would be no loss of soil and the impact would be temporary (albeit long-term). Because the project would not result in the long-term loss of soils that could be turned into prime soils at some point in the future (e.g., the resource is preserved for posterity and future potential use), this impact is considered less than significant.

Although the County's General Plan is very protective of Agricultural Resource lands such as the subject parcel, General Plan policies 5.13.3 and 5.13.4 show a clear intent to allow Agricultural Resource lands to be used for public parks or biotic reserves (County of Santa Cruz, 1994). The specific policy language is stated below:

5.13.3 Land Use Designations for Agricultural Resource Lands:

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

All lands designated Agricultural Resource shall be maintained in an Agricultural Land Use designation, unless the property is included in a public park or biotic reserve and assigned [sic] as Parks, Recreation and Open Space (O-R), Resource Conservation (O-C), or Public Facility (P) land use designations.

5.13.4 Zoning of Agricultural Resource Land:

Maintain all lands designated as Agricultural Resources in the "CA", Commercial Agricultural Zone District, except for land in agricultural preserves zoned to the "AP", Agricultural Preserve District or the "A-P", Agriculture Zone District and Agriculture Preserve Combining Zone District; timber resource land zoned to be "TP", Timber Production Zone District; or public parks and biotic conservation areas zoned to be "PR", Parks, Recreation and Open Space Zone District.

In addition to these policies, this project is not subject to General Plan Policy 5.13.20 (Conversion of Commercial Agricultural Lands). This conversion policy prohibits the conversion of commercial agriculture uses to non-agricultural uses without a determination that the land is nonviable for agriculture. As noted above, Policies 5.13.3 and 5.13.4 allow for Agricultural Resources—which are, by definition, viable agriculture land—to be used for public parks and biotic reserves without limitation or condition. County Code 16.50.080 requires that the Type 3 Agricultural Resource designation be removed for all rezoning except for when the rezoning is to PR, TP or CA. This is significant because it indicates that a viable Agriculture Resource may be designated and zoned for a biotic reserve use, i.e. not an agricultural use without a determination agricultural viability. This project, then, is not subject to General Plan Policy 5.13.20.

Although the proposed project area is surrounded by Type 3 commercial agricultural land, no habitable spaces, including dwellings, habitable accessory structures and additions, etc., are proposed. Therefore, no agricultural buffer setback would be required as per County Code Section 16.50.095.

Impacts from project implementation would be considered less than significant.

2. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

***Discussion*:** The project site is designated for Agriculture under the Santa Cruz County General Plan (Santa Cruz County 1994). The proposed project site is zoned for Commercial Agriculture (CA) under the Zoning Ordinance of the Santa Cruz County Code. CA zoned lands are specifically reserved for commercial agricultural pursuits such as the cultivation of plant crops, commercial raising of animals for grazing and livestock, and apiculture. Most CA zoned lands are also designated as an Agricultural Resource Type in the County General

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Plan. The Agricultural Resource designation identifies the quality of soil on the parcel and level of agricultural viability based on soil type. Permitted uses and structures on CA zoned lands are limited to those associated with commercial agriculture production. Agricultural Viability Determinations are required to prove that the parcel is not viable agricultural land and to facilitate a rezoning out of CA or a land division. "Facilities for fish and wildlife enhancement and preservation" are principally permitted within the CA zone. (SCCC 13.10.312(B)) The proposed project, therefore, is consistent with the applicable zoning regulations for the project site.

The project is not protected under a Williamson Act contract. Thus, the proposed project would have no impact on zoning for agriculture use or on a Williamson Act contract.

3. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒

***Discussion*:** The project is not located near land designated as Timber Resource. Therefore, the project would not affect the resource or access to harvest the resource in the future. The timber resource may only be harvested in accordance with California Department of Forestry timber harvest rules and regulations. No impact would occur.

4. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

***Discussion*:** No forest land occurs on the project site or in the immediate vicinity. See discussion under B-3 above. No impact is anticipated.

5. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

***Discussion*:** Although the proposed project would convert approximately 20 acres of agricultural land to a wetland and upland biotic reserve, no adjacent agricultural lands would be converted as a result of the project. The 20 acres selected for ecological restoration are subject to routine flooding, which prevents economically viable agricultural production (Dobler pers. comm.). Conversion of 20 acres of low quality farmland habitat to wetland

habitat is considered less than significant due to the inability to yield viable crops from the site.

C. AIR QUALITY

The significance criteria established by the Monterey Bay Unified Air Pollution Control District (MBUAPCD) has been relied upon to make the following determinations. Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. *Conflict with or obstruct implementation of the applicable air quality plan?*	☐	☐	☒	☐

Discussion: The project would not conflict with or obstruct any long-range air quality plans of the Monterey Bay Unified Air Pollution Control District (MBUAPCD). Because general construction activity related emissions (i.e., temporary sources) are accounted for in the emission inventories included in the plans, impacts to air quality plan objectives are less than significant. See C-2 below.

General estimated basin-wide construction-related emissions are included in the MBUAPCD emission inventory (which, in part, form the basis for the air quality plans cited below) and are not expected to prevent long-term attainment or maintenance of the ozone and particulate matter standards within the North Central Coast Air Basin (NCCAB). Therefore, temporary construction impacts related to air quality plans for these pollutants from the proposed project would be less than significant, and no mitigation would be required, since they are presently estimated and accounted for in the District's emission inventory, as described below. No stationary sources would be constructed that would be long-term permanent sources of emissions.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. *Violate any air quality standard or contribute substantially to an existing or projected air quality violation?*	☐	☒	☐	☐

Discussion: The North Central Coast Air Basin (NCCAB) does not meet state standards for ozone and particulate matter (PM_{10}) (MBUAPCD, 2013a). These pollutants are both emitted during construction activities.

Ozone is the main pollutant of concern for the NCCAB. The primary sources of ROG within the air basin are on- and off-road motor vehicles, petroleum production and marketing, solvent evaporation, and prescribed burning. The primary sources of NOx are on- and off-road motor vehicles, stationary source fuel combustion, and industrial processes. In 2010, daily emissions of ROGs were estimated at 63 tons per day. Of this, area-wide sources represented 49 percent, mobile sources represented 36 percent, and stationary sources represented 15 percent. Daily emissions of NOx were estimated at 54 tons per day with 69 percent from mobile sources, 22 percent from stationary sources, and 9 percent from area-wide sources. In addition, the region is "NOx sensitive," meaning that ozone

formation due to local emissions is more limited by the availability of NOx as opposed to the availability of ROGs (MBUAPCD, 2013b).

PM_{10} is the other major pollutant of concern for the NCCAB. In the NCCAB, highest particulate levels and most frequent violations occur in the coastal corridor. In this area, fugitive dust from various geological and man-made sources combines to exceed the standard. Nearly three quarters of all NCCAB exceedances occur at these coastal sites where sea salt is often the main factor causing exceedance (MBUAPCD, 2005). In 2005 daily emissions of PM_{10} were estimated at 102 tons per day. Of this, entrained road dust represented 35 percent of all PM_{10} emission, windblown dust 20 percent, agricultural tilling operations 15 percent, waste burning 17 percent, construction 4 percent, and mobile sources, industrial processes, and other sources made up 9 percent (MBUAPCD, 2008).

Emissions from construction activities represent temporary impacts that are typically short in duration, depending on the size, phasing, and type of project. Air quality impacts can nevertheless be acute during construction periods, resulting in significant localized impacts to air quality. Table 3 summarizes the threshold of significance for construction activities.

Table 3: Construction Activity with Potentially Significant Impacts from Pollutant PM_{10}

Activity	Potential Threshold*
Construction site with minimal earthmoving	8.1 acres per day
Construction site with earthmoving (grading, excavation)	2.2 acres per day

*Based on Midwest Research Institute, Improvement of Specific Emission Factors (1995). Assumes 21.75 working weekdays per month and daily watering of site.

Note: Construction projects below the screening level thresholds shown above are assumed to be below the **82 lb/day threshold of significance**, while projects with activity levels higher than those above may have a significant impact on air quality. Additional mitigation and analysis of the project impact may be necessary for those construction activities.

Source: Monterey Bay Unified Air Pollution Control District, 2008.

Impacts

As required by the MBUAPCD, construction activities (e.g., excavation, grading, on-site vehicles) which directly generate 82 pounds per day or more of PM_{10} would have a significant impact on local air quality when they are located nearby and upwind of sensitive receptors such as the community of Watsonville (Table 3). Construction projects below the screening level thresholds shown in Table 3 are assumed to be below the 82 lb/day threshold of significance, while projects with activity levels higher than those thresholds may have a significant impact on air quality. Although the proposed project would ultimately grade up to 46 acres, it would actively grade no more than 2.2 acres per day as outlined in Table 3. A total of 24.5 pounds per day of PM_{10} would be the maximum generated during excavation with the incorporation of the proposed mitigation measures (Table 4). Although the project would produce PM_{10}, it would be far below the 82 pounds per day threshold. This would result in less than significant impacts on air quality from the generation of PM_{10}.

Table 4: Estimated Construction Emissions from Land Clearing and Excavation

Project Phases	Pounds/Day									
	ROG	CO	NO_{x24}	Total PM_{10}	*Exhaust PM_{10}*	*Fugitive Dust PM_{10}*	Total $PM_{2.5}$	*Exhaust $PM_{2.5}$*	*Fugitive Dust $PM_{2.5}$*	CO_2
Grubbing/Land Clearing	**2.0**	**11.1**	**21.0**	**23.2**	*1.2*	*22.0*	**5.6**	*1.1*	*4.6*	**2,235.8**
Excavation	**4.9**	**25.3**	**49.1**	**24.5**	*2.5*	*22.0*	**6.8**	*2.2*	*4.6*	**5,189.0**
Maximum (pounds/day)	**4.9**	**25.3**	**49.1**	**24.5**	*2.5*	*22.0*	**6.8**	*2.2*	*4.6*	**5,189.0**
Total (project tons)	**1.0**	**5.3**	**10.2**	**6.8**	*0.5*	*6.3*	**1.8**	*0.5*	*1.3*	**1,076.6**

Assumptions:
- Project Start Year: 2016
- Project Length (months): 60
- Total project Area (acres): 46
- Maximum Area Disturbed/Day (acres): 2.2
- PM_{10} and $PM_{2.5}$ estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
- Total PM_{10} emissions shown are the sum of exhaust and fugitive dust emissions. Total $PM_{2.5}$ emissions are the sum of exhaust and fugitive dust emissions.

Source: Sacramento Metropolitan Air Quality Management District, Road Construction Emissions Model, Version 7.1.5.1

Construction projects using typical construction equipment such as dump trucks, scrapers, bulldozers, compactors and front-end loaders that temporarily emit precursors of ozone [i.e., volatile organic compounds (VOC) or oxides of nitrogen (NOx)], are accommodated in the emission inventories of state- and federally-required air plans and would not have a significant impact on the attainment and maintenance of ozone AAQS (MBUAPCD 2008).

Although not a mitigation measure per se (i.e., required by law), California ultralow sulfur diesel fuel with a maximum sulfur content of 15 ppm by weight will be used in all diesel-powered equipment, which minimizes sulfur dioxide and particulate matter.

The following Best Management Practices (BMPs) and Best Available Control Technology (BACT) will be implemented during all site excavation and grading.

Mitigation Measures

The project impacts would be reduced to a less than significant level with implementation of the required MBUAPCD emission control measures, i.e., diesel engine and fugitive dust controls.

AQ-1 Contracted Diesel Control Measures: In addition to the use of Tiered engines and California ultralow sulfur diesel fuel, the following requirements will be incorporated into contract specifications:

- To minimize potential diesel odor impacts on nearby receptors (pursuant to MBUAPCD Rule 402, Nuisances), construction equipment will be properly tuned. A schedule of tune-ups will be developed and performed for all equipment operating within the project area. A written log of required tune-ups will be maintained and a copy of the log will be submitted to the County of Santa

Cruz Department of Public Works (DPW) Planning Director for review every 2,000 service hours.

- Fixed temporary sources of air emissions (such as portable pumps, compressors, generators, etc.) will be electrically powered unless the contractor submits documentation and receives written approval from the County of Santa Cruz DPW that the use of such equipment is not practical, feasible, or available (generally contingent upon power line proximity, capacity, and accessibility). California ultralow sulfur diesel fuel with maximum sulfur content of 15 ppm by weight (ppmw S), or an approved alternative fuel, will be used for on-site fixed equipment not using line power.
- To minimize diesel emission impacts, construction contracts will require off-road compression ignition equipment operators to reduce unnecessary idling with a 2-minute time limit, subject to monitoring and written documentation.
- On-road material hauling vehicles will shut off engines while queuing for loading and unloading for time periods longer than 2 minutes, subject to monitoring and written documentation.
- Off-road diesel equipment will be fitted with verified diesel emission control systems (e.g., diesel oxidation catalysts) to the extent reasonably and economically feasible.
- Utilize alternative fuel equipment (i.e., compressed or liquefied natural gas, biodiesel, electric) to the extent reasonably and economically feasible.

Feasibility will be determined consistent with Best Available Control Technology (BACT) general criteria: 1) achieved in practice; 2) contained in adopted control measures; 3) technologically feasible; and 4) cost-effective.

AQ-2 Diesel Particulate Matter Emissions Control Measures: In addition, the project will implement the following measures to reduce particulate matter emissions from diesel exhaust:

- Grid power will be used instead of diesel generators where it is feasible to connect to grid power (generally contingent upon power line proximity, capacity, and accessibility).
- The project specifications will include 13 CCR Sections 2480 and 2485, which limit the idling of all diesel-fueled commercial vehicles (weighing over 10,000 pounds, both California- or non-California-based trucks) to 30 seconds at a school or 5 minutes at any location. In addition, the use of diesel auxiliary power systems and main engines will be limited to 5 minutes when within 100 feet of homes or schools while the driver is resting.
- The project specifications will include 17 CCR Section 93115, Airborne Toxic

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Control Measure for Stationary Compression Ignition Engines, which specifies fuel and fuel additive requirements; emission standards for operation of any stationary, diesel-fueled, compression-ignition engines; and operation restrictions within 500 feet of school grounds when school is in session.

- A schedule of low-emissions tune-ups will be developed and such tune-ups will be performed on all equipment, particularly for haul and delivery trucks.
- Low-sulfur (≤ 15 ppmw S) fuels will be used in all stationary and mobile equipment.

AQ-3 Dust Control Measures: The following controls will be implemented at the construction and staging sites as applicable:

- Water all active construction areas at least twice daily as necessary and indicated by soil and air conditions.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
- Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, will be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.
- All on-site unpaved roads and off-site unpaved access roads will be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities will be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When materials are transported off site, all material will be covered, or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container will be maintained.
- All operations will limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

expressly forbidden.)

- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles will be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- Within urban areas, trackout will be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- Any site with 150 or more vehicle trips per day will prevent carryout and trackout.
- Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
- Enclose, cover, water twice daily, or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 miles per hour.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.
- Replant vegetation in disturbed areas as quickly as possible.
- Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site.
- Install wind breaks at windward side(s) of construction areas.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 20 miles per hour.
- Limit the area subject to excavation, grading, and other construction activity at any one time.

Implementation of the above BMPs and BACT would ensure that emissions of diesel particulate matter (DPM) and fugitive dust from project excavation and grading would be consistent with the MBUAPCD emissions inventories. Impacts would be less than significant.

3. *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?*	☐	☐	☒	☐

Discussion: Project construction would have a limited and temporary potential to contribute to existing violations of California air quality standards for ozone and PM_{10} primarily through diesel engine exhaust and fugitive dust. However, the Santa Cruz

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

monitoring station has not had any recent violations of federal or state air quality standards mainly through dispersion of construction-related emission sources. BMPs and BACT described above under C-2 would ensure emissions remain below a level of significance. Therefore, the proposed project would not result in a cumulatively considerable net increase in criteria pollutants. The impact on ambient air quality would be less than significant.

4. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐

***Discussion*:** The greatest potential for adverse ambient pollutant impacts would be from the exposure of nearby sensitive receptors to the DPM emitted by the diesel-powered equipment during project construction. The total DPM emissions from project construction equipment were estimated and the SCREEN3 dispersion model was used to determine health risk to the closest receptors (USEPA 1995). The cancer risk at the closest residential receptor from project equipment DPM would be 0.03 in a million (compared with the MBUAPCD significance threshold of 10 in a million). Such a low value for cancer risk is not surprising given: 1) the relatively short time during which the emissions would occur (three years, with by-far the largest fraction of the emissions occurring in the first year); 2) the relatively large site area (about 20 acres working area) over which the DPM emissions would be spread; and 3) the relatively long distance (about 0.25 miles for the closest residence to the site boundary) over which the DPM would disperse during transport to the sensitive receptors. Thus, there would be a less than significant impact to sensitive receptors from ambient exposure to DPM from project construction equipment.

5. Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

***Discussion*:** California ultralow sulfur diesel fuel with a maximum sulfur content of 15 ppm by weight would be used in all diesel-powered equipment, which minimizes emissions of sulfurous gases (sulfur dioxide, hydrogen sulfide, carbon disulfide, and carbonyl sulfide). Therefore, minimal objectionable odors are anticipated from construction activities associated with the proposed project, and no mitigation measures would be required. Given that the nearest actual sensitive receptors (all residences) are few, sparsely distributed and come no closer than about 0.25 miles to the project site, the proposed project would not create objectionable odors affecting a substantial number of people; therefore, impacts are expected to be less than significant.

D. BIOLOGICAL RESOURCES

Would the project:

1. Have a substantial adverse effect, either directly or through habitat modifications,	☐	☒	☐	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, or U.S. Fish and Wildlife Service?

***Discussion*:**

Setting

Before being modified for agriculture in the early 1900s, the site likely contained a matrix of grasslands, seasonal wetlands, perennial open water "backwater lake" features, and tidal marsh. From the early 1900s until 2007 a portion of the site, south of Watsonville Slough, was used for farming. Flooding occurs during the rainy season, which is why the site conditions are not well suited to farming. The site is no longer used for agricultural purposes, but portions of the site are annually disked.

The current composition of plant communities on the Bryant-Habert and Wait parcels includes low seasonal marsh, high seasonal marsh, ruderal wet meadow, willow scrub, and ruderal grassland habitat (Table 5). These vegetation communities are largely a factor of surface water conditions, ground water conditions, historic seed bank and distribution of seed from surrounding seed sources. The current configuration of the wetland habitat within the 46 acres site includes 23.1 acres of jurisdictional wetlands and waters of the U.S. (Attachment 6), as defined by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA).

Coastal and Valley Freshwater Marsh

The high and low seasonal marsh habitat within the project area is characterized by Holland (1986) as coastal and valley freshwater marsh. These areas support predominately native plant species, constitute relatively rare and under-represented habitat types within the Watsonville Sloughs watershed and provide desirable habitat conditions for a wide range of wildlife species. Dominant species include perennial emergent monocots including narrow leaved-cattail (*Typha angustifolia*), broad-leaved cattail (*Typha latifolia*), bur-reed (*Sparganium eurycarpum*), bulrush (*Schoenoplectus* spp.), sedge (*Carex* spp.) watercress (*Nasturtium aquaticum*), nutsedge (*Cyperus* spp.), and rush (*Juncus* spp.).

Fresh emergent wetland vegetation is present in/around middle Watsonville Slough and the contributing sloughs, Hanson, Struve and West Branch Struve. In 2010 and 2011, the high seasonal marsh habitat areas supported the locally rare native plant species, bracted popcorn flower (*Plagiobothrys bracteatus*), as well as other uncommon native plant species such as golden dock (*Rumex maritima*) and water speedwell (*Veronica anagallis-aquatica*). Areas identified as high and low seasonal marsh habitat would not be disturbed during grading activities and require no re-vegetation activity, with the exception of those areas designed to

provide a surface water connection between the Watsonville Slough channel and the planned seasonal wetland depressions (See Attachment 2).

Table 5: Vegetation Types and Acreages

Vegetation Type	Existing Acreage	Acres Enhanced During Implementation of the Project[1]	Acres Restored During Implementation of the Project[2]	Total Acres on the Property after Project Implementation
High Seasonal Marsh (Coastal and Valley Freshwater Marsh)	4.7 acres (between 8-9 ft. elev.)	4.6 acres (between 8- 9 ft. elev.)	2 acres (between 8-9 ft. elev.)	6.6 acres
Low Seasonal Marsh (Coastal and Valley Freshwater Marsh)	5.9 acres (between 7-8 ft. elev.)	0.0 acres (between 7- 8 ft. elev.)	2.8 acres (between 7-8ft. elev.)	8.8 acres
Ruderal Wet Meadow (Seasonal Wetland)	12.7 acres (between 8 and 10 ft. elev.)	Wet meadow enhancement is planned for 1.8 acres within 8 – 10 foot elev. and is intended to provide high quality native wet meadow habitat within the existing ruderal wet meadows on site.	8.0 acres within the 8-10 foot elev. and is intended to provide high quality native wet meadow habitat within the existing ruderal wet meadows on site.	9.8 acres
Ruderal Grassland	4.9 acres (between 10 and 12 ft. elev.)	0.6 acres (between 10 – 12 foot elev.)	1.8 acres (within 10 – 12' elev.)	2.4 acres
Willow scrub (Central Coast Riparian Scrub)	12.6	5	0	11.8
Total	20 project site/ 46 parcel	12 acres	14.7 acres	39.6

Notes:
1. Enhanced habitat acreages include acres of existing vegetation in which the habitat quality is improved through the recommendations of this Plan.
2. Restored habitat acreage includes areas of the property in which agricultural production is removed and native habitat is restored through the recommendations of this Plan.

Ruderal Wet Meadow

The ruderal wet meadow habitat areas on the property contain extensive growth of non-native, invasive plant species, including bristly ox-tongue (*Helmenothica echoides*) and various other invasive thistle species. However, throughout this habitat, there are concentrations of native plants and non-native, non-invasive plants. These areas have been mapped and identified as containing desirable habitat. Native plants in these areas include marsh goldenrod (*Euthamia occidentalis*) and horsetail fern (*Equisetum arvensis*).

Areas where wet meadow habitat is dominated by non-native invasive species would be managed to support more desirable vegetation. Areas where these habitats are dominated by non-native, but non-invasive species will generally be preserved, as they are not considered a management priority. Some areas would be converted into other habitats through grading

and re-vegetation. Maps to differentiate between desirable and undesirable plant communities in these habitat areas would be updated prior to implementation of project activities.

Central Coast Riparian (Willow) Scrub

As described by Holland (1986), Central Coast riparian scrub is a scrubby streamside thicket, varying from open to impenetrable, dominated by any of several willow species. This early seral community may succeed to any of several riparian woodland or forest types in the absence of severe flooding disturbance. This community occurs on relatively fine-grained sand and gravel bars that are close to river channels and therefore close to ground water. Within the study area, central coast riparian scrub is characterized by dense arroyo willow (*Salix lasiolepis*) stands with smaller amounts of red-osier dogwood (*Cornus sericea*) and shining willow (*Salix lasiandra* var. *lasiandra*). Common understory species include California blackberry (*Rubus ursinus*) and slough sedge (*Carex obnupta*). In some areas, there is no understory vegetation.

Willow scrub habitat within the project area is found throughout the property below the 10' elevation contour and is considered a desirable vegetation community due to its habitat value for a diversity of bird and mammal species. While relatively common in the sloughs, willow scrub habitat is decreasing in many parts of the slough system due to the decade long trend of consistently high levels of surface water in areas that historically dried annually. Emerging willow scrub habitat therefore has value in the context of watershed-wide habitat availability and associated value to wildlife. Most areas mapped as willow scrub would be preserved. Some areas with willows less than 6-inch diameter at breast height (dbh) would be converted into other habitats through grading and re-vegetation.

Ruderal Grassland

This habitat typically comprises a dense to sparse cover of annual grasses, often associated with numerous species of annual and perennial forbs. These grasslands grow actively during winter and spring and remain dormant during summer and early fall. In the project area, ruderal grassland is generally found on fine-textured, clay-rich soils that were not cultivated, such as some slopes abutting Hanson, West Struve and Watsonville Sloughs. Native plants in these areas include coyote brush (*Baccharis pilularis*) and non-native plants that are considered non-invasive and naturalized within the sloughs watershed and throughout the State, include annual grasses and forbs such as Italian rye (*Festuca perrene*), annual oats (*Avena fatua*), and cut-leaf geranium (*Geranium disectum*).

Grasslands in the greater Watsonville area provide habitat for special status species, including Santa Cruz tarplant (*Holocarpha macradenia*), Monterey spineflower, Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), San Francisco popcorn flower (*Plagiobothrys diffusus*), Choris' popcorn flower (*Plagiobothrys chorisianus* var. *chorisianus*), Santa Cruz

clover (*Trifolium buckwestiorum*), and Kellogg's horkelia (*Horkelia cuneata* ssp. *sericea*), yet none have been historically recorded from the project area.

Sensitive Natural Communities

Four sensitive natural communities were observed within the study area: seasonal wetlands, coastal and valley freshwater marsh, Central Coast riparian scrub and open water. These are considered sensitive natural communities as they may qualify as a Waters of the U.S. and/or Waters of the State falling under U.S. Army Corps of Engineers and Regional Water Quality Control Board jurisdictions through the Clean Water Act and the Porter Cologne Water Quality Act.

As recognized by Sawyer et al. (2009), coastal freshwater marsh on site is expressed as the *Scirpus microcarpus* Herbaceous Alliance (Small-fruited Bulrush Marsh), among other alliances. This alliance may be considered of high inventory priority as it is considered to have a Subnational Conservation Status Rank of "S2" (NatureServe, 2010). A rank of S2 indicates a vegetation type is "Imperiled" both globally and in the State meaning it is at high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors (NatureServe, 2010).

As recognized by Sawyer et al. (2009), Central Coast riparian scrub on site is expressed as *Cornus sericea* ssp. *sericea* Shrubland Alliance (Red Osier Thickets), among other alliances. This alliance may be considered of high inventory priority as it is considered to have a Subnational Conservation Status Rank of "S3" (NatureServe, 2010). A rank of S3 indicates that more information is verified a vegetation alliance or association as "Vulnerable" meaning it is at moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors (NatureServe, 2010).

Open Water

A small portion of the project site would impact seasonally open water habitat and associated mudflat located in Watsonville Slough. Watsonville Slough at this location is approximately 10-feet wide from top of bank to top of bank and flows east to west through the northern half of the property until it reaches the western boundary of the project at which point it flows through two 5-foot diameter metal culverts under the railroad. Conditions downstream of the project site result in restricted conveyance. Mudflats represent an important habitat type within the slough system, providing habitat for permanent and migratory shorebirds in fall months. Areas that support mudflats will be preserved and proposed grading activities are designed to increase mudflat habitat. A wetland delineation survey of the project site was conducted by Ken Oster (NRCS) in April 2013. Results of this survey indicate that within the project site there are 23.1 acres of jurisdictional wetland and 8.1 acres of non-jurisdictional wetland.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Special Status Species

For the purposes of this evaluation, special-status plant and wildlife species are defined as those species listed as endangered, threatened, or proposed for listing under Federal Endangered Species Act (FESA), as amended (Code of Federal Regulations [CFR], Title 50, Section 17), and/or species protected under the Migratory Bird Treaty Act (MBTA) (16 U.S. Code [USC] 703-712); the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d; June 8, 1940) as amended; Marine Mammal Protection Act of 1972, as amended (2001); California Endangered Species Act (CESA) (California Code of Regulations Title 14, Section 670.5); California Fish and Game Code (Sections 1901, 2062, 2067, 3511, 4700, 5050 and 5515); and/or Native Plant Protection Act of 1977. Special-status species also include locally rare species defined by CEQA guidelines 15125(c) and 15380, which may include species that are designated as sensitive, declining, rare, locally endemic or as having limited or restricted distribution by various federal, state and local agencies, organizations and watch lists. Their status is based on their rarity and endangerment throughout all or portions of their range.

Tables C-1 and C-2 in Attachment 4 provide a summary of the status and habitat requirements for each of the special-status plant and animal species with potential to occur in the larger project study area. Species only protected under the MBTA (i.e., not federally-listed under the FESA) are not listed in Table C-2 because most bird species occurring in California fall under the protection of the MBTA. The lists in Tables C-1 and C-2 are a compilation of species obtained from the USFWS species list for the Watsonville West USGS 7.5-minute quadrangle , a search of the CNDDB (CDFW CDFW 2014), relevant literature, knowledge of regional biota, existing data from regional experts, and observations made during field investigations.

Special Status Plants

Based on the field investigations, review of available databases and literature, familiarity with local flora, and on-site habitat suitability, no federal and/or state listed and California rare plant species were observed or are considered to have the potential to occur within the study area. Please refer to Attachment 4 for a discussion of the potential for occurrence of special-status plant species based on habitat suitability and local distribution.

Santa Cruz Tarplant

The federally threatened Santa Cruz tarplant (*Holocarpha macradenia*) is known from the Watsonville Slough system. Critical habitat for the Santa Cruz tarplant was designated in 2002 when 2,902 acres were identified in Santa Cruz, Monterey, and Contra Costa counties as important for the conservation and recovery of the species. The Primary Constituent Elements (PCE) for Santa Cruz tarplant consist of, but are not limited to soils associated with coastal terrace prairies, including the Watsonville, Tierra, Elkhorn, Santa Inez, and Pinto series; plant communities that support associated species, including native grasses such

as needlegrass (*Nassella* spp.) and California oatgrass (*Danthonia californica*); native herbaceous species such as members of the genus *Hemizonia* (other tarplants), Gairdner's yampah (*Perideridia gairdneri*), San Francisco popcorn flower (*Plagiobothrys diffusus*), and Santa Cruz clover (*Trifolium buckwestiorum*). The PCE for Santa Cruz tarplant also includes the physical processes, particularly soils and hydrologic processes that maintain the soil structure and hydrology that produce the seasonally saturated soils characteristic of Santa Cruz tarplant habitat (USFWS 2002).

Santa Cruz tarplant has not been detected on the Bryant-Habert property and the nearest population is located one mile north at High Ground Organics where 205 plants were observed in 2007 (USFWS 2012). The soil type at the Bryant-Habert project site is Clear Lake clay, a soil that is not known to support Santa Cruz tarplant or the associated plant communities. The project area is immediately adjacent to but is not within the designated critical habitat for the Santa Cruz tarplant. It is unlikely that Santa Cruz tarplant would be present on the project area due to the historical intensive farming practices and non-compatible soil type.

Special Status Wildlife

Based on the field investigation, review of available databases and literature, familiarity with local fauna, and on-site habitat suitability, a total of 36 special-status animal species were considered in this evaluation. Of these, 13 were determined to have the potential to occur within the project area or adjacent habitats, and could be affected by project construction activities (see Table 6). The remaining 23 species are not expected to occur on site based on the lack of suitable habitat (e.g., tidal, serpentine, vernal pool, vernal swale and dune habitats), local extirpations, lack of connectivity between areas of suitable and occupied habitat, incompatible land use and/or habitat degradation.

Federal/State Listed, Proposed, Candidate and/or Fully Protected Species

California Red-legged Frog

The federally threatened California red-legged frog (*Rana draytonii*) is known to occur in the Watsonville Slough system although CNDDB observation records are limited and extend back only to 1990 when more than 10 adults were first documented in the East Branch of Hansons Slough. In 1999, 10 subadults were documented on the property adjacent to the Bryant-Habert parcel in the agricultural ditch next to the railroad tracks and one dead adult was discovered at the Harkins Slough railroad crossing. Upstream, or east, of Highway 1, two individuals were observed in 2001 in Struve Slough near Tarplant Hill and one adult was observed in 2004 in Watsonville Slough at the Harkins Slough Road crossing near Ramsey Park.

Table 6: Potentially Occurring and Occurring Special-Status Fish and Wildlife Species

Common Name	Species Name	Listing Status*
Federal/State Listed, Proposed, Candidate and/or Fully Protected Species		
California red-legged frog	*Rana draytonii*	FT, CSC
Santa Cruz long-toed salamander	*Ambystoma macrodactylum croceum*	FE, SE, FP
White-tailed kite	*Elanus leucurus*	FP
Bald Eagle	*Haliaeetus leucocephalus*	DL, SE
Least Bell's vireo	*Vireo bellii pusillus*	FE/SE
Sensitive and Locally Rare Species		
Western pond turtle	*Actinemys marmorata*	CSC
Osprey	*Pandion haliaetus*	WL
Northern harrier	*Circus cyaneus*	CSC
Short-eared owl	*Asio flammeus*	CSC
Western burrowing owl	*Athene cunicularia hypugaea*	CSC
Yellow warbler	*Dendroica petechia*	CSC
Tricolored blackbird	*Agelaius tricolor*	CSC
Dusky-footed woodrat	*Neotoma fuscipes annectens*	CSC

Notes:

FEDERAL
FE = Federally listed as Endangered
FT = Federally listed as Threatened
CH = Critical Habitat (Proposed or Final) is designated
DL = Delisted

STATE
SE = State listed as Endangered
ST = State listed as Threatened
CSC = California Species of Special Concern
FP = Fully Protected
WL = Watch List

Biologists Gary Kittleson of Kittleson Environmental Consulting (KEC), Bryan Mori of Bryan Mori Biological Consulting Services (BM) and Mark Allaback of Biosearch Associates (BA) conducted summer season presence/absence surveys and daily monitoring for the federally threatened California red-legged frog for the three slough-crossing bridges on Harkins Slough Road. During the monitoring period (2004-2007) biologists found no frogs in the sloughs upstream of Highway 1. In 2004, 15 California red-legged frogs were relocated from the Harkins Slough Road crossing at West Branch Struve Slough (1.2 miles from the project site) and in 2005, 12 individuals were relocated from the Lee Road crossing (0.75 mi. from the project site).

With authorization from USFWS, breeding season surveys at the Watsonville Slough Farms and Bryant-Habert property began in 2007 by KEC, BA and BM. Initially, two agricultural ponds within 0.1 mile of the project area were sampled and the lower pond was found to support small numbers of egg masses (1-2) and larvae (<5) each year and have since become known as the "breeding ponds." Since then, scattered non-breeding season observations of adults, sub adults and metamorphs were documented from the breeding ponds and the nearby Watsonville Slough ditch, riparian willow stand and railroad crossing culverts (both upstream and downstream).

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

USFWS Protocol surveys were conducted during winter and early spring of 2013 and, due to drought, limited breeding season surveys were done in 2014. Areas surveyed by KEC, BA and BM on the Watsonville Slough Farms and Bryant-Habert properties include Chivos Pond, Upper Hansen Slough, Middle Watsonville Slough, Lower Harkins Slough, the willow riparian habitat at the culvert crossing and the wetland habitat along the rail line. The two established "breeding ponds" north of the project site on the Watsonville Slough Farm property provide breeding habitat for California Red-legged frog in most years (Attachment 5).

Breeding activity has also been confirmed in the main Bryant-Habert/Watsonville Slough ditch line at the railroad crossing and in middle Watsonville Slough, adjacent to the proposed project site. Breeding activity has been documented, but not confirmed in Lower Harkins Slough and the Harkins Slough wetland habitats along the rail line. Limited 2013 California Red-legged frog breeding activity was also detected in the upper east branch of Hanson Slough, but no egg masses or larvae were detected. Summer season observations of adult and sub-adult California Red-legged frog have been documented from Chivos Pond, the breeding ponds the railroad crossing and the Watsonville Slough ditch upstream of the railroad crossing (KEC 2012; 2013).

Elsewhere in the lower Pajaro Valley, California red-legged frogs have been observed at 19 distinct locations in the Pajaro River downstream of Murphy Crossing since 2009. They are also known from Ellicott Slough (3.0) mi. northwest of the project site, the headwaters of Corralitos Creek at Grizzly Flat (10 mi. north) and the Elkhorn Slough system to the south.

Bullfrog (*Rana catesbeiana*) and tree frog (*Pseudacris regilla*) larvae are known to be present in Chivos Pond, Middle Watsonville Slough (especially the Bryant-Habert ditch line), Harkins and Hansons Slough, and are now consistently present in the established California Red-legged frog breeding ponds. Predatory fish species that are known to be present in the study area include Non-native carp (*Cyprinus carpio*), brown bullhead (*Ictalurus nebulosus*), largemouth bass *(Micropterus salmoides*), bluegill (*Lepomis macrochirus*) and Native Sacramento blackfish (*Orthodon microlepidotus*) (KEC 2012).

Santa Cruz Long-toed Salamander

The Santa Cruz long-toed salamander is both federally-listed and state-listed as endangered, and is a fully protected species in the State of California. This species inhabits coastal woodland and chaparral near ponds and marshes, which are used for breeding. The Santa Cruz long-toed salamander spends most of the year underground in animal burrows or in spaces among root systems of woody plants. Habitat requirements include shade and abundant soil humus with nearby shallow ponds with abundant submerged vegetation (NatureServe 2011). While known from Ellicott Slough National Wildlife Area, 3.0 miles northwest, the species is not known to occur in the project area.

White-tailed Kite

White-tailed kite is designated as fully protected under Section 3511 of the California Fish and Game Code. Suitable nesting habitat for this species is present in the project area and pairs and individuals have been observed in Middle Watsonville Slough during the 2014 nesting season (G. Kittleson pers. comm.). There are no nests currently confirmed within or adjacent to the proposed project area; however, ruderal habitat within the site provides suitable foraging habitat for kites. White-tailed kites typically nest in trees near a water source and may occur in suburban areas with adjacent open areas with abundant prey. Potential impacts of project construction on white-tailed kite would only occur if construction was scheduled during the nesting season (February through August). If present, noise from restoration activities could result in the disturbance to active nests causing abandonment or reproductive failure of white-tailed kites.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*), has been delisted under FESA, is listed as endangered under CESA and is designated as a fully protected species by §3511 of the California Fish and Game Code. Bald eagles inhabit forested areas adjacent to large bodies of water including lakes, reservoirs, rivers, estuaries and the coastline (Buehler 2000). They are opportunistic and will feed on carrion, but actively prey on a variety of fish, mammals and birds (Buehler 2000). Breeding begins in early spring in the north and are single-brooded (Baicich and Harrison 2005).

Nests are built from sticks and branches in a large tree or a rocky outcrop; they have also been known to nest on the ground on islands (Baicich and Harrison 2005). Bald eagles winter in temperate areas typically below 500 meters in elevation (Baicich and Harrison 2005). Roosts sites are often located in large conifers in the west near aquatic foraging areas (Baicich and Harrison 2005).

A pair of nesting bald eagles has been documented from Gallighan Slough near the confluence with Harkins Slough (G. Kittleson pers. comm.). Suitable nesting and foraging habitat is present within the project area and this species is expected to occur in the project area as a rare, year-round resident.

Least Bell's Vireo

Least Bell's vireo (*Vireo bellii pusillus*) is listed as endangered under both the CESA and FESAs. The population and geographic range of the species has decreased due to loss of riparian habitat, habitat fragmentation and nest parasitism by brown-headed cowbirds (*Molothrus ater*).

Least Bell's vireo preferred habitat is a well-developed riparian canopy with a dense shrub understory. Least Bell's vireos arrive at their breeding habitat in mid to late March and

typically leave by the end of September. Breeding occurs April through August. Foraging typically occurs in habitats that are close to nesting sites in riparian habitat and adjacent chaparral, scrub and oak woodlands. The Watsonville Sloughs and Pajaro River floodplain is not within the breeding range of least Bell's vireos. Due to a lack of mature riparian habitat, potential for Least Bell's vireo in the project area is limited.

Sensitive and Locally Rare Species

Western Pond Turtle

Western pond turtle (*Actinemys marmorata*) (WPT) occurs in the Pacific Coast region, of North America from Washington State to Baja California, west of the Cascade Mountains and Sierra Nevada Range (Bury 1970; Nussbaum et al. 1983; Iverson 1986; Stebbins 2003). The major portion of the distribution is in California (Rathburn et al. 2002). It is the only native turtle in California. Recent genetic studies indicate the presence of four groups or clades within the species; although historically there were two recognized subspecies. (Bury and Germano 2008) The species appears to be declining in abundance in the northernmost and southernmost portion of its range; but not in the core of its range from central California to southern Oregon. The primary threats are loss and alteration of both aquatic and terrestrial habitats. These losses fragment remaining populations and, perhaps, magnify the effects of introduced species through predation, competition, and epidemic diseases (Bury and Germano 2008).

WPT inhabits the lower Pajaro River and is present in low numbers in the Watsonville Slough system. They are commonly observed during warm, sunny days basking on submerged wood and mud banks on the Pajaro River and infrequently on submerged willow trunks and tule stands in the slough system. From 2009-2013, KEC and B A have collected data from a mark-recapture study to estimate a population of approximately 150 WPT at over 20 trap locations within the Pajaro River study area below Murphy Crossing to the Pajaro Lagoon.

Since 2004, KEC has observed 6 WPT in the entire slough system, including Struve Slough, Watsonville Slough, and Hanson Slough. While previously known to occur in a pond near Atkinson Lane in Watsonville, that population appears to have been lost (M. Allaback and B. Mori pers. comm.). Potential and confirmed nesting habitat is present in the non-native grassland and weedy, ruderal habitat near the Pajaro River and within the channelized floodplain. Suitable nesting habitat is present at the Bryant-Habert property, the Watsonville Slough Farm and surrounding uplands.

Despite the paucity of WPT data in the sloughs, WPT may be expected to occur throughout the project area.

Special-Status Birds

The structural complexity of riparian and freshwater wetland habitats in the study area provide optimal nesting habitat and foraging conditions for many sensitive or locally rare bird species. Some of the bird species with the potential to occur in the project area include osprey (*Pandion haliaetus*), northern harrier (Circus cyaneus), short-eared owl (*Asio flammeus*), western burrowing owl (*Athene cunicularia hypugaea*), yellow warbler (*Dendroica petechial*), and tricolored blackbird (*Agelaius tricolor*). Attachment 4 describes habitat requirements for these species. The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712; MBTA) and the California Fish and Game Code Section 3503 prohibits the take, possession, or needless destruction of the nest or eggs of any bird; Section 3503.5 prohibits the take, possession, or needless destruction of any nests, eggs or birds in the orders Falconiformes (new world vultures, hawks, eagles, ospreys and falcons, among others) or Strigiformes (owls); Section 3511 prohibits the take or possession of fully protected birds; and Section 3513 prohibits the take or possession of any migratory nongame bird or part thereof as designated in the MBTA.

Temporary disturbance to riparian and aquatic vegetation in addition to upland (ruderal) vegetation would result in the disturbance to nesting habitat. If project activities occur during the nesting season (February 1 to August 1), the project could result in the disturbance to active nests causing abandonment or reproductive failure. If restoration activities occur during the non-nesting season, project activities (including vegetation removal) would not result in the loss of known or active nests. The project is not anticipated to result in disturbance to non-breeding birds beyond causing birds to flush from foraging or roosting areas.

Dusky-footed Woodrat

Dusky-footed woodrat (*Neotoma fuscipes*) are a California Species of Special Concern generally found in dense chaparral, oak and riparian woodland, and mixed conifer forest habitats that have a well-developed understory. They favor brushy habitat or woodland with a live oak component. They are highly arboreal, and thick-leaved trees and shrubs are important habitat components for the species (Williams et al. 1992). Vegetation removal may result in the loss of active setts or nests as well as temporary disturbance of occupied habitat for dusky-footed woodrat, if present.

Impacts

The project's potential effects on special-status species are identified in separate impacts identified by individual protected resource below.

Loss of Remnant Agricultural Habitat

Project activities would result in conversion of approximately 20 acres of remnant agricultural habitat, to a mosaic of wetland and upland habitat. Remnant agricultural habitat provides foraging, roosting and nesting opportunities for several species of special status

birds including white-tailed kite (*Elanus leucurus*), burrowing owl (*Athene cunicularia*), northern harrier (*Circus cyaneus*), and short-eared owl (*Asio flammeus*). Temporary disturbance to remnant agricultural habitat would not be considered a significant impact to these species because there is an abundance of suitable foraging, roosting and nesting habitat within the larger Watsonville Slough ecosystem available during the construction work windows. Conversion of 20 acres of this habitat type to a mosaic of wetland and upland habitat would also not be considered a significant impact as these species will inhabit restored site after construction. In fact, the long term benefits of project activities would result in 20 acres of higher quality foraging, roosting and nesting habitat for special status birds. This impact is considered less than significant.

Disturbance to Special Status Birds During Construction

Suitable winter roosting habitat and nesting habitat for special status species is present within the project site. Migratory birds (including eggs and chicks) are protected under the MBTA (16 U.S.C. 703-712) administered by the USFWS's Division of Migratory Bird Management, which makes it unlawful, unless expressly authorized by permit pursuant to federal regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export at any time, or in any manner, any migratory bird, or any part, nest, or egg of any such bird." Most bird species occurring within California fall under the protection of the MBTA except those species that belong to the families not listed in any of the four treaties, such as European starling (*Sturnus vulgaris*). Nesting birds are also protected under CFGC §3503, which prohibits the take, possession, or needless destruction of the nest or eggs of any bird.

The project may result in indirect impacts (e.g., mortality or nest abandonment) and/or indirect impacts (e.g., temporary changes in foraging patterns or territories, noise disturbance, winter roost abandonment, etc.) to sensitive bird species protected under the MBTA. Special-status birds with potential to occur in the vicinity of the project site are listed in Table 2 in Attachment 3. The fallow field, willow thickets and marsh habitat within the site and outside the project site provides roosting, foraging and nesting habitat for special-status birds. Temporary disturbance of roosting birds during the construction work windows would not be considered a significant impact because there is an abundance of suitable roosting habitat available to these birds in the area. Temporarily displaced birds would move to other suitable roosting and foraging habitat during construction. However, project activities, such as vegetation removal, during the bird-nesting season (February 1 to August 1) could have the potential to cause nest abandonment and death of young or loss of reproductive potential at active nests located near project activities. Implementation of Mitigation Measure BIO-1 would reduce this impact to less than significant.

Disturbance to Western Pond Turtle During Construction

Watsonville Slough provides aquatic habitat for the special status western pond turtle (*Emys (=Clemmys) marmorata*), which is a California State species of special concern. There have been several observations of this species in the Watsonville Slough system (G. Kittleson pers. comm.). Western pond turtle habitat includes ponds, marshes, rivers, streams, and irrigation canals. Nests are typically constructed in upland habitat within 0.25 miles of aquatic habitat. Watsonville and Struve Sloughs provide suitable aquatic habitat for this species within the larger study area and the upland portions of the project site provide suitable nesting habitat. During construction, there is potential for injury or mortality of turtles moving through the site, due to being crushed by vehicles, humans, or construction equipment associated with project activities. Implementation of Mitigation Measure BIO-2 would reduce this potential impact to less than significant.

Increased Sedimentation and Turbidity

Construction activities near/in open water may result in direct effects on Watsonville Slough as a result of increased sedimentation rates and/or turbidity concentrations if fine sediment is mobilized within, or discharged to this resource. Increased sedimentation and turbidity may also adversely affect water quality and substrate composition. Temporary increases in turbidity levels would be minimized through implementation of Mitigation Measures BIO-3.

Disturbance to California Red-legged Frog and their Habitat

Implementation of project activities would temporarily disturb aquatic and upland habitat known to support the federally threatened California red-legged frog.

USFWS, as one of the project proponents, will prepare a Biological Opinion for compliance with Section 7 of the ESA. During informal consultation between USFWS and USACE the federal agencies will identify appropriate minimization and avoidance measures similar to those provided in Mitigation Measure BIO-4 below to avoid potential project impacts to federally listed species, including California red-legged frog. As a result, this impact would be less than significant with mitigation.

To reduce any potential impacts of spraying operations on California red-legged frog and other wildlife and native plants, herbicide applications will be utilized within the constraints of additional minimization and avoidance measures as outlined in BIO-5.

Disturbance to Dusky-footed Woodrat and their Habitat

Vegetation removal in Central Coast riparian scrub habitat may result in the loss of active nests as well as temporary disturbance of occupied habitat for the dusky-footed woodrat. Implementation of Mitigation Measure BIO-6 would minimize construction impacts on this species. As a result, this impact would be less than significant with mitigation.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Mitigation Measures

BIO-1: Conduct Preconstruction Surveys and Implement Minimization and Avoidance Measures in Suitable Habitat for Nesting Bird Species, if Present

If removal of vegetation prior to the onset of construction begins during the bird nesting season (February 1st to August 1st), then a preconstruction nesting bird survey will be conducted by a qualified biologist. The survey will be conducted within the vegetation scheduled for removal and a 300 foot buffer no more than two weeks prior to construction activities. If no active nests are found within the vegetation, no further mitigation is necessary. If active nests (i.e., nests in the egg laying, incubating, nestling or fledgling stages) are found within 300-feet of proposed activities, then the following steps would be implemented:

1. If active nests are found within 300 feet of the disturbance footprint for raptor (birds of prey) species or 100 feet of the disturbance footprint for all other bird species, no-disturbance buffers should be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover, the nesting pair's tolerance to disturbance, and the type/duration of potential disturbance. Work within no-disturbance buffers should be rescheduled to occur after the young have fledged as determined by a qualified biologist.
2. If rescheduling of work is infeasible and no-disturbance buffers cannot be maintained, a qualified biologist should be on site to monitor active nests for signs of disturbance. If it is determined that project-related activities are resulting in nest disturbance, work should cease immediately and the California Department of Fish and Wildlife (CDFW) and USFWS should be contacted for further guidance.
3. Construction activities conducted outside of the breeding season (i.e., August 2nd to January 29th) would not require preconstruction nesting bird surveys or establishment of no-disturbance buffers.

BIO-2: Conduct Preconstruction Survey for Western Pond Turtle and Install Wildlife Exclusion Fencing

Immediately prior to the onset of construction activities, a qualified biologist would conduct a pre-construction survey within the section of Watsonville Slough that borders the project area, to determine the presence or absence of western pond turtle. If turtles are present, the following measure would be implemented:

The construction contractor or project sponsor would install protective temporary fencing, or Wildlife Exclusion Fencing (see Mitigation Measure BIO-4), to prevent the migration of western pond turtles into the work area.

The placement and installation of the fencing would be approved by a qualified biologist prior to commencement of construction activities. Wildlife Exclusion Fencing would be designed not to impede the movement of wildlife to and from the slough and would be maintained for the duration of construction, and would be removed following completion of the project.

BIO-3: Implement Best Management Practices

The project applicant would implement the BMPs outlined in Table 7 to minimize stormwater runoff, erosion, and potential water quality impacts associated with construction activities. In addition, all contractors working in a capacity that could increase the potential for adverse water quality impacts shall receive training regarding the environmental sensitivity of the site and need to minimize impacts. Contractors also shall be trained in implementation of stormwater BMPs for protection of water quality.

Table 7: Construction-Related Best Management Practices

BMP #	Name	BMP
BMP -1	Erosion Control and Construction-Related Turbidity	1. Traffic speeds on unpaved roads will be limited to 15 mph. 2. If dewatering is required during construction, such water will be discharged through a silt curtain or to vegetated upland areas with less than a one-percent slope and at least 200 feet from wetlands to filter and decant water removed during dewatering activities. 3. Sandbags or other erosion control measures will be employed to prevent runoff and construction-related turbidity. 4. Upland soils exposed due to construction activities will be stabilized using native or non-invasive seed and straw mulch. 5. Any erosion control fabric will consist of natural fibers that will biodegrade over time. No plastic or other non-porous material will be used as part of a permanent erosion control approach. 6. Other erosion control measures shall be implemented as necessary to ensure that sediment or other contaminants do not reach surface water bodies for stockpiled or reused/disposed sediments.
BMP -2	Staging and Stockpiling of Materials	1. All construction equipment will be staged in upland areas, away from sensitive natural communities or habitats. 2. All construction-related items, including equipment, stockpiled material, temporary erosion control treatments, and trash will be removed within 72 hours of project completion. All residual soils and/or materials will be cleared from the project site. 3. Building materials and other construction-related materials, including chemicals, will not be stockpiled or stored where they could spill into water bodies or storm drains, or where they could cover aquatic or riparian vegetation.
BMP - 3	Spill Prevention and Response Plan	A Spill Prevention and Response Plan will be developed prior to commencement of construction activities, and will summarize the measures described below. The work site will be routinely inspected to verify that the Spill Prevention and Response Plan is properly implemented and maintained. Contractors will be notified immediately if there is a noncompliance issue. 1. Equipment and materials for cleanup of spills will be available on site. 2. All spills and leaks will be cleaned up immediately and disposed of properly. 3. Prior to entering the work site, all field personnel shall be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills. 4. Field personnel shall implement measures to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means. 5. Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). All field personnel shall be

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

		advised of these locations and trained in their appropriate use. 6. Absorbent materials will be used on small spills located on impervious surfaces rather than hosing down the spill; wash waters shall not discharge to surface waters. For small spills on pervious surfaces such as soils, wet materials will be excavated and properly disposed of rather than buried. The absorbent materials will be collected and disposed of properly and promptly. 7. As defined in 40 CFR 110, a federal reportable spill of petroleum products is the spilled quantity that: ▪ violates applicable water quality standards; ▪ causes a film or sheen on, or discoloration of, the water surface or adjoining shoreline; or ▪ causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines. If a spill is reportable, the contractor's superintendent will notify the Land Trust and the Land Trust will take action to contact the appropriate safety and cleanup crews to ensure that the Spill Prevention and Response Plan is followed. A written description of reportable releases must be submitted to the appropriate RWQCB and the California Department of Toxic Substances Control (DTSC). This submittal must contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases will be documented on a spill report form. If an appreciable spill has occurred, and results determine that project activities have adversely affected surface water or groundwater quality, a detailed analysis will be performed to the specifications of DTSC to identify the likely cause of contamination. This analysis will include recommendations for reducing or eliminating the source or mechanisms of contamination. Based on this analysis, the Land Trust or contractors will select and implement measures to control contamination, with a performance standard that surface and groundwater quality must be returned to baseline conditions. These measures will be subject to approval by the Land Trust, DTSC, and the RWQCB.
BMP - 4	Equipment and Vehicle Maintenance and Cleaning	1. All vehicles and equipment will be kept clean. Excessive build-up of oil or grease will be prevented. 2. Vehicle and equipment maintenance activities will be conducted in a designated area to prevent inadvertent fluid spills from adversely impacting water quality. This area will be clearly designated with berms, sandbags, or other barriers. 3. Secondary containment, such as a drain pan or drop cloth, to catch spills or leaks will be used when removing or changing fluids. Fluids will be stored in appropriate containers with covers, and properly recycled or disposed of off-site. 4. Cracked batteries will be stored in a non-leaking secondary container and removed from the site. 5. Spill cleanup materials will be stockpiled where they are readily accessible. 6. Incoming vehicles and equipment will be checked for leaking oil and fluids (including delivery trucks and employee and subcontractor vehicles). Leaking vehicles or equipment will not be allowed on-site. 7. Vehicles and equipment will not be washed on-site. Vehicle and equipment washing will occur at an appropriate wash station.
BMP - 5	Refueling	1. All fueling sites shall be equipped with secondary containment and avoid a direct connection to underlying soil, surface water, or the storm drainage system. 2. For stationary equipment that must be fueled on-site, secondary containment such as a drain pan or drop cloth shall be provided in such a manner to prevent accidental spill of fuels to underlying soil, surface water, or the storm drainage system.
BMP -6	On-Site Hazardous Materials Management	1. The products used and/or expected to be used and the end products that are produced and/or expected to be produced after their use will be inventoried. 2. As appropriate, containers will be properly labeled with a "Hazardous Waste" label and hazardous waste will be properly recycled or disposed of off-site. 3. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers or in a storage shed (completely enclosed), with appropriate secondary containment to prevent any spillage or leakage. 4. Quantities of equipment fuels and lubricants greater than 55 gallons shall be provided with secondary containment that is capable of containing 110 percent of the volume of primary container(s). 5. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials shall not be allowed to enter

		receiving waters or the storm drainage system. 6. Sanitation facilities (e.g., portable toilets) will be surrounded by a berm, and a direct connection to the storm drainage system or receiving water will be avoided. 7. Sanitation facilities will be regularly cleaned and/or replaced, and inspected regularly for leaks and spills. 8. Waste disposal containers will be covered when they are not in use, and a direct connection to the storm drainage system or receiving water will be avoided. 9. All trash that is brought to a project site during construction activities (e.g., plastic water bottles, plastic lunch bags) will be removed from the site daily.
BMP - 7	Fire Prevention	1. All earthmoving and portable equipment with internal combustion engines will be equipped with spark arrestors. 2. During the high fire danger period (April 1–December 1), work crews will have appropriate fire suppression equipment available at the work site. 3. On days when the fire danger is high, flammable materials will be kept at least 10 feet away from any equipment that could produce a spark, fire, or flame. 4. On days when the fire danger is high, portable tools powered by gasoline-fueled internal combustion engines will not be used within 25 feet of any flammable materials unless at least one round-point shovel or fire extinguisher is within immediate reach of the work crew (no more 25 feet away from the work area).
BMP - 8	Work Site Housekeeping	1. The work site will be maintained in a neat and orderly condition, and left in a neat, clean, and orderly condition when work is complete. 2. Materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged.

BIO-4: Compliance with USFWS Biological Opinion for proposed project. Conservation Measures may include any/all of the following:

California Red-legged Frog Protective Measures

1. The Land Trust will ensure that the Service-approved biologist or designated monitor will be given full authority to stop work if the avoidance and minimization measures listed below are not being followed. If work is stopped, the Service will be notified immediately.

2. A Service-approved biologist will conduct a pre-construction survey of the project site no sooner than 48 hours prior to onset of work activities. If any life stage of California red-legged frog is found and an individual(s) is likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move the individual(s) from the site before work activities begin. The Service-approved biologist will relocate such California red-legged frog(s) the shortest distance possible to a location that contains suitable habitat and that will not be affected by activities associated with the project. The Service-approved biologist will maintain detailed records of any California red-legged frog(s) that is relocated (e.g., size, coloration, any distinguishing features, and photographs) to assist in determining whether a translocated individual(s) is returning to the original point of capture.

3. Prior to construction activities, a Service-approved biologist will conduct an Employee Education Program for the construction crew. The biologist will meet with the construction crew prior to the onset of construction to educate the construction crew

on the following: (1) a review of the project boundaries, including staging areas and access routes; (2) the special-status species that may be present, their habitat, and proper identification; (3) how to avoid any special-status species that is encountered within the project site and report its presence to the Service- approved biologist; and (4) these avoidance and minimization measures as prescribed in this biological assessment.

4. A Service-approved biologist will be present at the work site until all ground-disturbing activities are completed. After this time, the Service-approved biologist will monitor the project area for compliance with all avoidance and minimization measures, or the Service-approved biologist will designate a person to monitor the project area for compliance with all avoidance and minimization measures if the Service-approved biologist will not be present. The Service- approved biologist will ensure that this monitor receives sufficient training in the identification of California red-legged frogs. The designated monitor must have experience and a background in natural resources.

5. On any day that ground-disturbing activities, mowing or weed whacking, or herbicide spraying are planned to occur, a Service-approved biologist will conduct a survey for California red-legged frogs in potentially affected areas before the work begins. If any life stage of California red- legged frog is found and an individual(s) is likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move the individual(s) from the site before work activities begin. The Service-approved biologist will relocate such California red-legged frog(s) the shortest distance possible to a location that contains suitable habitat and that will not be affected by activities associated with the project. The Service-approved biologist will maintain detailed records of any California red-legged frog(s) that is relocated (e.g., size, coloration, any distinguishing features, and photographs) to assist in determining whether a translocated individual(s) is returning to the original point of capture.

6. If a California red-legged frog(s) is observed during ground-disturbing activities, the Service- approved biologist will stop work in that area. The Service-approved biologist will relocate the California red-legged frog as described above.

7. Ground-disturbing construction activities, herbicide applications, mowing and weed whacking will only occur during the period from May 1 through October 31 provided that standing water has been absent from the site for at least 30 days.

8. If standing water is anticipated to remain on the project site after June 15th during any year of the project, the Land Trust will contact the Service for approval to conduct spraying, mowing or weed whacking, if needed to prevent seed set of non-native plants. Under these circumstances, the Land Trust will seek approval from the Service

at least 2 weeks in advance of the desired start of any mowing or weed whacking. At that time the Land Trust and Service will discuss the need for additional conservation measures. Additional conservation measures could potentially include the following: (1) work will only occur if no California red-legged frogs are found during a pre-activity survey conducted by a Service-approved biologist; (2) a clearly demarcated buffer area of at least 50 feet will be established around any standing water; (3) only weed whacking and hand-pulling could occur within the buffer area; (4) the Service-approved biologist will remain onsite when any activities are conducted within the buffer area; (5) the Service-approved biologist will stop all work if a California red-legged frog(s) is found on the project site; (6) the Land Trust will ensure the vegetation height is not cut below 18 inches within the buffer area; and/or (7) no activities will occur within standing water. Once the project site has been free of standing water for at least 30 days, mowing or weed whacking could continue without the need for additional conservation measures. If mowing or weed whacking is not approved by Service when standing water is present, then no mowing or weed whacking will occur until there is no standing water for at least 30 days.

9. To prevent inadvertent entrapment of California red-legged frogs during the proposed project, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered at the close of each working day with plywood or similar materials. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals.

10. If silt fencing is required per erosion control Best Management Practices, only high-quality reinforced silt fencing will be used and efforts will be made to install it in a way that does not inhibit movements of California red-legged frogs. Openings will be created approximately every 100 feet.

11. Cleaning and refueling of equipment and vehicles will occur only within designated staging areas on previously paved or graded parking areas. All herbicides, fuels, lubricants, and equipment will be stored, poured, or refilled at least 50 feet from wetland habitat, riparian habitat or water bodies in a location where a spill will not drain directly toward aquatic habitat. No maintenance or cleaning of equipment will occur within wetland or riparian areas, or within 50 feet of such areas. All equipment and vehicles will be checked and maintained on a daily basis to ensure proper operation and avoid potential leaks or spills.

12. During construction, all project-related spills of hazardous materials within or adjacent to the project site will be cleaned up immediately. Spill prevention and clean-up materials will be onsite at all times during construction. Construction materials/debris will also be stored within the designated staging areas. No debris, soil, silt, sand, oil, petroleum products, cement, concrete, or washings thereof will be allowed to enter

into, or be placed where they may be washed by rainfall or runoff, into wetland or riparian habitats.

13. Prior to the onset of work, the NRCS will ensure that a plan is in place for a prompt and effective response to accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

14. Only a licensed herbicide contractor with experience working on habitat restoration sites along the Central California Coast will perform all applications of herbicides.

15. Herbicide application will be made in accordance with label recommendations. The Land Trust and the licensed herbicide contractor will implement the pesticide best management practices described in (See Attachment 8, Appendix B). Persons applying herbicide will wear all required personal protective equipment and follow safety protocols and measures.

16. Only those herbicides or surfactants specifically identified in the project description will be used.

17. Containers of herbicide (concentrated or diluted) will be under direct supervision of the herbicide applicator at all times.

18. Sprayers, chemicals, and mixing equipment for herbicides will be contained in non-tip, leak- proof containers at all times, except when contents are being used or accessed.

19. Only enough herbicide will be mixed for the immediate application; however, if there is excess, the herbicide will be disposed of according to Environmental Protection Agency and California Department of Pesticide Regulation regulations.

20. Herbicides used at the site will be used according to all best management practices, precautions, and recommendations listed on the label. To reduce potential impacts of spraying operations on California red-legged frog, no herbicide applications will occur on the project site within 30 days of the last standing water within the swale system. One treatment per year for the first two years will be accomplished using boom spray equipment attached to an ATV or wheeled tractor. However, for all herbicide applications, precedence will be given to spot treatments (with the use of marking dye) over full-coverage applications; minimizing the potential harmful effects to wildlife and the environment.

21. Herbicide applications will not occur in wind conditions exceeding 7 miles per hour or when rain is forecasted within 72 hours of treatment.

22. Only non-ionic surfactants (e.g. Agri-Dex) or surfactants that are not toxic to fish and

wildlife will be used on the project site. No surfactants containing polyehtoxylated tallowamine (POEA) will be used on the project site.

23. All trash that may attract predators will be properly contained, removed from the project site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

24. The Service-approved biologist(s) will follow the Declining Amphibian Populations Task Force's Code of Practice (See Attachment 8, Appendix C). The Service-approved biologist may substitute a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water) for the ethanol solution.

Additional Best Management Practices and Avoidance Measures

1. Seasonal Avoidance. Construction and maintenance will be scheduled to minimize effects on listed species and habitats. All work will be conducted between April 15 and October 15, or, if allowed by regulatory agencies during permit acquisition, maintenance activities may be completed later in the season. No activities shall occur between October 15 or the onset of the rainy season, whichever occurs first, and May 1, except for during periods greater than 72 hours without precipitation. The National Weather Service (NWS) 72-hour forecast for the project area will be monitored. If a 70 percent or greater chance of rainfall is predicted within 72 hours of construction activity, all activities will cease until no further rain is forecast. If rain exceeds ¼ inch during a 24-hour period, work will cease until no further rain is forecast. Activities can only resume after site inspection by a qualified biologist. The rainy season is defined as a frontal system that results in depositing 0.25 inches or more of precipitation in one event.

2. Night Work. All construction activities will occur during daylight hours (sunrise to sunset).

4. Environmentally Sensitive Habitat Area (ESHA) Fencing. Prior to the start of construction, Environmentally Sensitive Habitat Areas – defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed – will be clearly delineated using high visibility orange fencing. Construction work areas include the active construction site and all areas providing support for the proposed project, including areas used for vehicle parking, equipment and material storage and staging, access roads, etc. The fencing will remain in place while construction activities are ongoing, and will be regularly inspected and fully maintained at all times. The final project plans will depict all locations where ESHA fencing will be installed and will provide installation specifications. The bid solicitation package special provisions will clearly describe acceptable fencing material and prohibited construction-related activities including vehicle operation, material

and equipment storage, access roads and other surface-disturbing activities within Environmentally Sensitive Habitat Areas. In addition, hydrological features (i.e., topographic depressions, drainage ditches, culverts, etc.) outside of the proposed project footprint will not be manipulated (i.e., re-routed, dredged, filled, graded, etc.). This will avoid potential effects on wetlands and waters outside of the proposed project footprint that are hydrologically connected to aquatic features within the proposed project footprint.

5. Wildlife Exclusion Fencing (WEF). Prior to the start of construction, WEF will be installed at the edge of the project footprint in all areas where California red-legged frogs could enter the construction area. The location of the fencing shall be determined by the USFWS-approved biologist in cooperation with USFWS and CDFW prior to the start of staging or ground disturbing activities. The location, fencing materials, installation specifications, and monitoring and repair criteria shall be approved by USFWS prior to start of construction. The WEF shall remain in place throughout the duration of the project and shall be regularly inspected and fully maintained. Repairs to the WEF shall be made within 24 hours of discovery. Upon project completion the WEF shall be completely removed, the area cleaned of debris and trash, and returned to natural conditions.

6. Access and Staging. Vehicles to and from the proposed project site will be confined to existing roadways to minimize disturbance of upland habitat. Prior to movement of heavy construction equipment into the construction area, a USFWS-approved biologist will make sure the route is clear of amphibians. Staging of vehicles and equipment will be confined to a predetermined area. Prior to movement of heavy construction equipment into the construction area, the staging area will be clearly marked on construction drawings and biologists will supervise the installation of orange barrier fencing separating the staging area from adjacent Environmentally Sensitive Areas. Vehicle speeds will not exceed 15 miles per hour to avoid special-status species on or traversing the access road.

BIO-5: The following protective Measures shall be implemented for protection of amphibians and other wildlife during the application of herbicides:

Non-native broadleaf plants will be excluded with annual applications of a broadleaf-specific herbicide for the first two years of grass establishment. Broadleaf-specific herbicides used at the site will include selective post-emergent herbicides that control broadleaf weeds at a variety of plant growth stages and are approved for use near or over water bodies (though herbicide applications will not occur over water at any time during the project). One to two treatments per year for the first two years will be accomplished using boom spray equipment attached to an ATV or tractor. Spot treatments with a hand-wand attached to an ATV or

backpack sprayer will be applied in lieu of broadcast treatments if broadleaf plants are not overly competitive or ubiquitous. All spot treatments shall utilize a marker dye to reduce the likelihood of repeat applications. To reduce any potential impacts of spraying operations on California red-legged frog and other wildlife and native plants, herbicide applications will be utilized within the constraints of additional minimization and avoidance measures as described below.

1. For all chemical applications, precedence will be given to spot treatments over full coverage applications; minimizing the potential harmful effects to wildlife and the environment. A non-specific post emergent systemic herbicide approved for over-water use may be applied as a spot-treatment in areas where broadleaf-specific herbicides are not effective and would not impact newly established or naturally recruited native plants. These applications will also follow avoidance and minimization measures as described below.

    - Surfactants are used to improve the effectiveness of an herbicide by reducing surface tension and increasing chemical penetration into the plant tissue. Some surfactants have been shown to be toxic to fish and aquatic species. Only non-ionic surfactants (e.g. Agri-dex) or surfactants that are not toxic to fish and wildlife shall be used on the project site. R-11 surfactants, for example, will not be used.

    - Herbicide use will strive to minimize toxicity while providing the most effective control to minimize applications for herbicides approved for use in and near aquatic environments, including restriction for use within buffer zones as described in the following avoidance and minimization measures and Cal EPA guidance document (see Attachment 7, Pesticide Use Restrictions, U.S. EPA). Herbicides are planned to include – Milestone (Active ingredient: aminopyralid), and Rodeo (Active ingredient: glyphosate). If these herbicides are not available, a suitable alternative will be utilized of an herbicide approved for over-water use, which does not include any that are restricted for use within a buffer zone (see Attachment 7).

2. Specifications for Avoidance and Minimization Measures

    The following protection measures were developed based on rules, regulations, best practices and restrictions as imposed by the California Department of Pesticide Regulation. All instructions, restrictions, use limitations and disposal/spill remediation methods, described on each herbicide label shall be followed. The specific restrictions imposed by the injunction issued each herbicide label shall be followed. The specific restrictions imposed by the

injunction issued on October 20, 2006, by the U.S. District Court for the Northern District of California for the protection of the California red-legged frog and associated habitats will also be implemented (see Attachment 7).

- In areas where herbicides will be applied within 60 feet of the Ordinary High Water Mark of areas determined to be suitable California red-legged frog breeding habitat, only aquatic-safe formulations of herbicides will be used. No foliar application of herbicides would occur within 60 feet of current breeding habitat for the California red-legged frog or in any areas subject to potential drift to breeding habitat for the California red-legged frog.
- A 100-foot buffer zone adjacent to standing water and fully saturated soils will be established in the action area. No foliar application of herbicides will occur within the buffer.
- Foliar application will not be used in any areas subject to potential drift to surface water bodies.
- Herbicides will not be applied within 24 hours of predicted rain events (40 percent chance or greater for rainfall). This condition will reduce potential for runoff of herbicides into surface water bodies. Foliar application of herbicides or other spray application methods will not be applied when wind speeds exceed 10 miles per hour. This condition will reduce likelihood of drift into surface water bodies.
- Contractors will have all necessary licensing by California Department of Pesticide Regulation for herbicide application. Use of herbicides will be consistent with label instructions and Material Safety Data Sheets documents will be maintained.
- Integrated Pest Management Approaches: Applicators will also use non-chemical methods such as hand pulling or mowing and disking on seed stock and invasive plants to prevent seedling germination, thus reducing the need for herbicides.
- The lowest effective concentration needed for effectiveness would be used, typically specified as a range on the product label.
- No herbicides would be intentionally applied to non-target species.
- All containers will be labeled according to CDPR regulations.
- All containers will be disposed of according to CDPR regulations.
- All materials would be stored according to CDPR regulations.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

- All materials used would be recorded and reported per CDPR regulations.

BIO-6 Implement Dusky-footed Woodrat Protective Measures

The project proponent shall ensure that a qualified biologist conducts a survey for woodrat middens (i.e., nests) within all limits of construction prior to the initiation of clearing or grading in any given location. This survey should be conducted early enough to address any middens requiring removal prior to site clearing. If no middens are found within such areas, no further action is required. If middens are found and can be avoided, the biologist shall direct the contractor in placing orange barrier fencing or flagging between the proposed construction clearing and the midden, giving as much room as possible to avoid indirect disturbance to the midden, but no less than a minimum distance of 2 feet from and along the construction side of the middens to protect them from construction activities.

If the minimum fencing distance cannot be achieved and the middens cannot be protected and/or avoided, a qualified biologist shall disassemble middens, or, if adjacent habitat is not suitable, trap and relocate woodrats out of the construction area (using live traps) prior to the start of construction. In addition, the biologists shall attempt to relocate the disassembled midden to the same area where the woodrats are released. If young woodrats are present during disassembling, the biologists shall discontinue disassembling and return at least 48 hours later to allow time for the young to be relocated. The midden may not be fully disassembled until the young have left.

2. *Have a substantial adverse effect on any riparian habitat or sensitive natural community identified in local or regional plans, policies, regulations (e.g., wetland, native grassland, special forests, intertidal zone, etc.) or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?*	☐	☒	☐	☐

Discussion: Four sensitive natural communities were observed within the study area: seasonal wetlands, coastal and valley freshwater marsh, Central Coast riparian scrub and open water. In addition, a portion of the project area is designated as a biotic resource by Santa Cruz County. The project would be subject to the County of Santa Cruz County Code Chapter 16.32: Sensitive Habitat Protection for the purposes of (1) minimizing disturbance to biotic communities that are rare or especially valuable because of their special nature or role in an ecosystem, and that could easily be disturbed or degraded by human activity; and (2) protecting and preserving these biotic resources for their genetic, scientific, and

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

educational values.

The proposed project is also subject to County Policy 5.2.2 Riparian Corridor and Wetland Protection Ordinance: Implement the protection of Riparian Corridors and Wetlands through the Riparian Corridor and Wetland Protection ordinance to ensure no net loss of riparian corridors and riparian wetlands. The ordinance identifies and defines riparian corridors and wetlands, determines the uses which are allowed in and adjacent to these habitats, and specifies required buffer setbacks and performance standards for land in and adjacent to these areas. Any amendments to this ordinance shall require a finding that riparian corridors and wetlands shall be afforded equal or greater protection by the amended language. Coordination with Santa Cruz County Planning Department would occur prior to project implementation. At that time the Land Trust and County staff would determine, what if any, permits are required for compliance with County codes and ordinances in conjunction with the completion of CEQA.

In addition, disturbance to stream and riparian habitat is regulated by CDFW under FGC 1600 Lake and Streambed Alteration Agreement (LSAA). The RCDSCC would prepare a permit application, on behalf of the Land Trust and the Land Trust will comply with all protective measures outlined in the LSAA for the project.

The long-term effect of the project on natural communities would be beneficial as the estimated increase in seasonal wetland habitat would more closely reflect historic habitat conditions that may have been present within the Watsonville Slough ecosystem. In addition, there would be no net loss of Waters of the U.S. (open water) from project activities. With implementation of measures outlined in the project permits, combined with implementation of BMPs provided under Mitigation Measure BIO-3 this impact is considered less than significant with mitigation.

Mitigation Measure

BIO-7: Protection of Desirable Vegetation Areas

Prior to site preparation or grading activities, a thorough survey will be conducted by a qualified botanist or restoration ecologist to update the 2012 Desirable Vegetation Mapping and refine the areas subject to grading and/or vegetation management. The survey will update the 2012 survey as necessary to identify areas of desirable vegetation within the ruderal grassland and wet meadow habitat areas as well as the extent of low seasonal marsh, high seasonal marsh, mudflats, and seasonal wetlands, which are all considered to be desirable vegetation.

As a result of the 2012 and subsequent surveys, desirable plant communities will be avoided during site-preparation and grading work to the extent feasible. Site preparation activities may occur over several years for weed control. In that case,

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

identification and marking of the extent of desirable vegetation will be conducted each year prior to site preparation activities and these areas will be left intact. Areas of desirable vegetation may expand to occupy areas of undesirable vegetation after they are subject to management measures (see Table 1).

3.	*Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*	☐	☒	☐	☐

***Discussion*:** Restoration activities would result in hydrological interruption to 0.02 acres of Watsonville Slough through creation of a channel that would connect new depressions to the slough. Although this impact represents a permanent disturbance to open water habitat it would be considered less than significant because of the relative abundance of this habitat within the larger study area.

Excavation of and temporary disturbance to 6.4 acres of seasonal wetland and freshwater marsh habitat during creation of depressions would not represent a significant change in habitat types because existing low quality, degraded seasonal wetland would be restored to higher quality seasonal wetlands. Further, all disturbed areas that are not enhanced or restored would be restored to pre-project conditions.

Overall, the proposed project is expected to improve ecological functions and values of natural communities within the study area through restoration and creation of up to 20 acres of habitat. With implementation of BMPs provided under Mitigation Measure BIO-3 this impact is considered less than significant with mitigation.

4	*Interfere substantially with the movement of any native resident or migratory fish or wildlife species or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*	☐	☐	☒	☐

***Discussion*:** The enhancement and restoration of wetland and upland habitat would have no effect on fish passage through the adjacent Watsonville Slough ecosystem, nor would project activities interfere with movement of wildlife through the slough system. The proposed project would expand wetland habitat in the southeast region of the 441-acre Plan area, which would have a beneficial effect on movement of fish and wildlife and improved conditions for migratory species. Temporary disturbance to movement of native or resident species during implementation of restoration and enhancement activities would have

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

minimal impact given the proportion of available suitable habitat in the immediate vicinity of project site. This impact would be considered less than significant.

5. *Conflict with any local policies or ordinances protecting biological resources (such as the Sensitive Habitat Ordinance, Riparian and Wetland Protection Ordinance, and the Significant Tree Protection Ordinance)?*	☐	☐	☒	☐

Discussion: According to the Natural Resource Conservation Service Wetland Determination conducted on April 1, 2013, 23.1 acres of jurisdictional wetlands occur within the restoration area south of the existing Watsonville Slough (Attachment 6). Although not part of the wetland determination, the 14.08 acre area north of the Watsonville Slough is anticipated to be entirely jurisdictional wetland. The remaining 8.1 acres of the total 46.28 acre site was found to be non-wetland. The current composition of plant communities on the Bryant-Habert and Wait parcels include low seasonal wetland, high seasonal wetland, ruderal wet meadow, willow scrub, and ruderal grassland habitat.

Willow thickets would be removed from the project site prior to project implementation. Removal of willow trees would be regulated by CDFW through the 1602 Streambed Alteration Agreement and through acquisition of County Riparian Exception and Coastal Development Permit for the proposed project. With implementation of measures outlined in these project permits, combined with implementation of Mitigation Measure BIO-3 – Implement BMPs provided in Table 7 this impact is considered less than significant with mitigation.

The project would be consistent with the County of Santa Cruz Riparian Corridor and Wetlands Protection Ordinance with a Riparian Exception (Section 16.30.060 of the County Code). Also see discussions and mitigation measures specified under D-1 and D-2 above. The following findings would need to be made according to Section 16.30.060 of the County Code.

1. *That there are special circumstances or conditions affecting the property;*

   Historically, approximately 17 acres of the 46-acre site were able to support crops. However, the number of crops per season has declined from 2 to 0 due to chronic flooding, extended inundation, and seasonally high groundwater. Future farming of the land is no longer profitable with the current hydrological conditions. Future hydrological conditions (sea-level rise, etc.) are expected to further complicate the potential for profitable farming on the property. As a result, the site was chosen for ecological restoration through the Bryan-Habert/Wait Ecological Restoration Project.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

The Bryant-Habert/Wait Ecological Restoration Project is located within the boundaries of the Watsonville Slough Farms Management Plan (2012). The Land Trust of Santa Cruz County's Watsonville Slough Farms sits at the center of the lower Pajaro River watershed and intersects with four of the six individual sloughs that sustain Harkins, Hanson, Struve and Watsonville Sloughs. The Property and surrounding conservation properties represent a substantial opportunity where uplands, wetlands, and critical transition zones can be effectively managed to address impairments, and to restore a landscape with a mosaic of grasslands, riparian woodlands, and a variety of seasonal and perennial wetlands.

Through the planning process, the Land Trust developed the following vision statement to guide the development of the Plan and management of the Property:

Protect and restore the Watsonville Slough coastal wetland ecosystem, demonstrate economically and environmentally sustainable agricultural practices, and provide opportunities for appropriate research, public access and education.

No alternative exists to the proposed project that would allow the restoration and creation of riparian and wetland habitat while avoiding the riparian corridor.

2. *That the exception is necessary for the proper design and function of some permitted or existing activity on the property;*

   The Bryant-Habert/Wait Ecological Restoration Project is located within the boundaries of the Watsonville Slough Farms Management Plan (2012). Restoration of the proposed parcel to provide habitat for sensitive species would be consistent with the Watsonville Farms Management Plan. The restoration plan has been designed with sustainability for Harkins, Hanson, Struve and Watsonville Sloughs.

3. *That the granting of the exception will not be detrimental to the public welfare or injurious to other property downstream or in the area in which the project is located;*

   The proposed project would not be detrimental to the public welfare or injurious to other property downstream or in the area that the project is located. The project would be designed to retain water and provide for groundwater recharge. It would have no impact on flooding on- or off-site.

4. *That the granting of this exception, in the Coastal Zone, will not reduce or adversely impact the riparian corridor, and there is no feasible less environmentally damaging alternative; and*

   The proposed project is designed to restore the riparian corridor and associated wetlands that have been impacted by decades of intensive agricultural operations.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

The riparian corridor would be enhanced as a result of the project.

5. *That the granting of the exception is in accordance with the purpose of this chapter, and with the objectives of the General Plan and elements thereof, and the Local Coastal Program Land Use Plan.*

   The granting of the exception would be consistent with the General Plan. Minimal impacts to the riparian zone would occur during habitat restoration. The site would be revegetated with native vegetation as part of the revegetation plan.

6. *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*	☐	☐	☐	☒

Discussion: There are no Habitat Conservation Plans or Natural Community Conservation Plans that apply to the project area or vicinity. The Project site is part of and managed in accordance with several other management plans and programs, including the following:

- Watsonville Slough Farms Management Plan, 2012

Implementation of the proposed project would be consistent with the conservation goals set forth under these plans. The proposed project would have no impact on the provisions of an adopted HCP, NCCP, or other approved local, regional, or State HCP.

7. *Produce nighttime lighting that would substantially illuminate wildlife habitats?*	☐	☐	☐	☒

Discussion: All construction would be completed during daylight hours. No nighttime lighting impacts from project implementation would occur.

E. CULTURAL RESOURCES

Would the project:

1. *Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5?*	☐	☐	☐	☒

Discussion: Within Watsonville Slough are concrete banks and weir structures that are older than 45 years; however these structures would not be altered or impacted by proposed project activities. No other potential historical resources are present within or adjacent to the project site. Therefore, the proposed project would have no impact on historical resources.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?	☐	☒	☐	☐

Discussion: In February 2013, Vinnedge Environmental Consulting requested that the Northwest Information Center of the California Historical Resources Information System at Sonoma State University (NWIC) conduct an archaeological resource records search of the project area to determine if archaeological or historic resources would be impacted by the project. NWIC responded that no known archaeological or historic resources are known to exist on or in the general vicinity of the project site (Much, 2013). However, given the general environmental and cultural setting of the project site, NWIC found there is a moderate potential of identifying unrecorded Native American resources during project construction. The Resource Conservation District of Santa Cruz County met with Patrick Orozco, the local tribal representative, on May 2, 2013 at the project site. Mr. Orozco was not aware of any known cultural resources at the site (Orozco pers. comm.).

Due to the fact that the entire native ground surface within the project site has been substantially altered as a result of farming and has been subject to routine flooding, it is unlikely that previously unrecorded archaeological deposits would be discovered during construction of the project. However, the remote possibility still exists that project construction could result in disturbance to unknown, potentially significant archaeological resources. Implementation of Mitigation Measure CUL-1 would reduce potential impacts on currently unknown archaeological resources during construction to a less than significant level with mitigation by ensuring that construction is stopped before such resources, should they be discovered, are damaged, and that resources are evaluated by a qualified archaeologist.

CUL-1 All ground disturbing activity in the project area shall be monitored by a qualified archaeologist in the event a substantial intact deposit is found within the property. Pursuant to Section 16.40.040 of the Santa Cruz County Code, if archaeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the notification procedures given in County Code Chapter 16.40.040.

With implementation of the above mitigation measures, impacts to cultural resources would be less than significant.

3. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Discussion: No human remains are expected to occur within the project area. However, because of the possibility of unidentified (e.g., buried) human remains being found during

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

any construction involving earth disturbance, the following condition shall be required.

CUL-2: Pursuant to Section 16.40.040 of the Santa Cruz County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this project, human remains are discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the sheriff-coroner and the Planning Director. If the coroner determines that the remains are not of recent origin, a full archeological report shall be prepared and representatives of the local Native California Indian group shall be contacted. Disturbance shall not resume until the significance of the archeological resource is determined and appropriate mitigations to preserve the resource on the site are established.

Impacts would be considered less than significant with implementation of mitigation.

4. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074?	☐	☐	☒	☐

Discussion: See discussion under E-2. No Tribal Cultural Resources are known to occur in the project area. Impacts would be less than significant.

5. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

Discussion: No unique paleontological resources or unique geologic features are known to occur in the vicinity of the proposed project. No impacts are anticipated.

F. GEOLOGY AND SOILS

Would the project:

1. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
A. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
B. Strong seismic ground shaking?	☐	☐	☐	☒
C. Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
D. Landslides?	☐	☐	☐	☒

***Discussion (A through D)*:** The proposed project would not expose people or structures to potential substantial adverse effects due to rupture of a known earthquake fault, seismic ground shaking, liquefaction, or landslides because the project site is relatively flat and not subject to landslides or other slope failure hazards. No impact would occur.

2. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☒

***Discussion*:** Project activities would not result in potential for landslide, lateral spreading subsidence, liquefaction or collapse. No impact would occur.

3. Develop land with a slope exceeding 30%?	☐	☐	☐	☒

***Discussion*:** No slopes on the project site exceed 30% on the property. No impact is anticipated.

4. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐

***Discussion*:** Some potential for erosion exists during the construction phase of the project, however, this potential is minimal due to the relatively level nature of the site, and standard erosion controls are a required condition of the project. Prior to approval of a grading or building permit, the project must have an approved Erosion Control Plan (*Section 16.22.060 of the County Code*), which would specify detailed erosion and sedimentation control measures. The plan would include provisions for disturbed areas to be planted with ground cover and to be maintained to minimize surface erosion. Impacts from soil erosion or loss of topsoil would be considered less than significant.

5. Be located on expansive soil, as defined in Section 1802.3.2 of the California Building Code (2007), creating substantial	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

risks to life or property?

Discussion: Expansive soils shrink and swell as a result of moisture changes. This can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Although the project site is located on expansive soils, the proposed project does not involve construction of new structures or buildings that would expose risks to life or property due to expansive soils. No impact would occur.

6. Have soils incapable of adequately supporting the use of septic tanks, leach fields, or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Discussion: No septic systems are proposed as part of the project. No impacts would occur.

7. Result in coastal cliff erosion?	☐	☐	☐	☒

Discussion: The proposed project is not located in the vicinity of a coastal cliff or bluff; and therefore, would not contribute to coastal cliff erosion. No impact is anticipated.

G. GREENHOUSE GAS EMISSIONS

Would the project:

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐

Discussion: Santa Cruz County has recently adopted a Climate Action Strategy (CAS) intended to establish specific emission reduction goals and necessary actions to reduce greenhouse gas levels to pre-1990 levels as required under AB 32 legislation. The strategy intends to reduce greenhouse gas emissions and energy consumption by implementing measures such as reducing vehicle miles traveled through the County and regional long range planning efforts and increasing energy efficiency in new and existing buildings and facilities (County of Santa Cruz, 2013).

The proposed project, like all development, would be responsible for an incremental increase in green house gas emissions by usage of fossil fuels during the site grading and construction. It is estimated that construction of the proposed project would generate approximately 34 metric tons of greenhouse gas (GHG) emissions during the three-year implementation of its plan for native species reestablishment and wetland restoration. All project construction equipment would be required to comply with the Regional Air Quality Control Board emissions requirements for construction equipment. Following construction, the direct and indirect GHG emissions associated with other sources within the county or

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

state would be unchanged by the project. In addition, operational GHG emissions associated with the previous agricultural use of the site (e.g., plowing, seeding, harvest, etc.) would no longer be generated. Project construction emissions would be relatively small and would cease upon project completion. As a result, GHG emissions from project construction activities would not substantially contribute to the global GHG emissions burden and their impact would be less than significant.

2.	*Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?*	☐	☐	☒	☐

Discussion: The proposed project would restore native species and wetland habitat to the site. After completion, the project would not affect the operational GHG emissions of any source locally or elsewhere in the state, nor would it conflict with any local or state plan, policy or regulation to reduce GHG emissions. This impact is considered less than significant.

H. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

1.	*Create a significant hazard to the public or the environment as a result of the routine transport, use or disposal of hazardous materials?*	☐	☐	☒	☐

Discussion: The proposed project would not create a significant hazard to the public or the environment. No routine transport or disposal of hazardous materials is proposed. However, during construction, fuel would be used at the project site. In addition, fueling may occur within the limits of the staging area proposed to be located in an upland area within the southeast corner of the project site adjacent to the railroad tracks. Best management practices would be used to ensure that no impacts would occur. Impacts are expected to be less than significant.

2.	*Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*	☐	☐	☒	☐

Discussion: Please see discussion under H-1 above. Project impacts would be considered less than significant.

3.	*Emit hazardous emissions or handle hazardous or acutely hazardous*	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

materials, substances, or waste within one-quarter mile of an existing or proposed school?

***Discussion*:** The project site is not within 0.25-mile of a school. The nearest school is Pajaro Valley High School, which is located 1.0 mile north of the project site. Although fueling of equipment is likely to occur within the staging area, best management practices would be implemented. No impacts are anticipated.

4. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒

***Discussion*:** The project site is not listed on the "Cortese List" of hazardous materials sites compiled pursuant to Government Code Section 65962.5. In addition, the project site is not included on the February 13, 2015 list of hazardous sites in Santa Cruz County. No impacts are anticipated from project implementation.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

***Discussion*:** The project site is not located within two miles of a public airport or under a current airport land use plan. The closest public airport is Watsonville Municipal Airport, which is located 2.5 miles north of the project site. No impact would occur.

6. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

***Discussion*:** The project site is not located in the vicinity of a private air strip. The closest private airstrip to the project is the Monterey Bay Academy Airport, which is located 2.5 miles northwest of the project site. No impact would occur.

7. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Discussion: The proposed project would not conflict with implementation of the County of Santa Cruz Local Hazard Mitigation Plan 2010-2015 (County of Santa Cruz, 2010). Therefore, no impacts to an adopted emergency response plan or evacuation Plan would occur from project implementation.

8. *Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?*	☐	☐	☐	☒

Discussion: The project would be located in an agricultural field owned by the Land Trust. Project activities would not expose people or structures to risks involving wildland fires. Maintenance and monitoring of the site would include vegetation management and fire prevention in the form of annual disking/regular mowing, as necessary. No impact would occur.

I. HYDROLOGY, WATER SUPPLY, AND WATER QUALITY

Would the project:

1. *Violate any water quality standards or waste discharge requirements?*	☐	☐	☐	☒

Discussion: The proposed project would not result in a significant change to post-construction stormwater runoff or impact how stormwater is handled. The project would not violate any water quality standards or wastewater discharge requirement, therefore no impact would occur.

2. *Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?*	☐	☐	☐	☒

Discussion: The proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. The project would improve ground water quality through providing a wet meadow for filtration of adjacent agricultural run-off. The proposed project would have no impact on groundwater.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐

***Discussion*:** The project would alter the existing drainage pattern within the project site to reduce siltation and sedimentation and increase water quality conditions in Watsonville Slough. An erosion control plan would also be required per Section 16.22.060 of the County Code.

The following water quality protection and erosion and sediment control best management practices (BMPs) would be implemented, based on standard County requirements, to minimize construction-related contaminants and mobilization of sediment to the Watsonville Slough in the project area.

The BMPs will be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable and are subject to review and approval by the County. The County will perform routine inspections of the construction area to verify the BMPs are properly implemented and maintained. The County will notify contractors immediately if there is a noncompliance issue and will require compliance.

The BMPs will include, but are not limited to, the following.

- All earthwork or foundation activities involving rivers, ephemeral drainages, and culverts, will occur in the dry season (generally between June 1 and October 15).
- Equipment used in and around drainages and wetlands will be in good working order and free of dripping or leaking engine fluids. All vehicle maintenance will be performed at least 300 feet from all drainages and wetlands. Any necessary equipment washing will be carried out where the water cannot flow into drainages or wetlands.
- Develop a hazardous material spill prevention control and countermeasure plan before construction begins that will minimize the potential for and the effects of hazardous or toxic substances spills during construction. The plan will include storage and containment procedures to prevent and respond to spills and will identify the parties responsible for monitoring the spill response. During construction, any spills will be cleaned up immediately according to the spill prevention and countermeasure plan. The County will review and approve the contractors' toxic materials spill prevention control and countermeasure plan before allowing construction to begin. Prohibit the following types of materials from being rinsed or washed into the streets, shoulder areas, or gutters: concrete; solvents and adhesives; thinners; paints; fuels; sawdust; dirt; gasoline; asphalt and concrete saw

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

slurry; heavily chlorinated water.

- Any surplus concrete rubble, asphalt, or other rubble from construction will be taken to a local landfill.
- An erosion and sediment control plan will be prepared and implemented for the proposed project. It will include the following provisions and protocols. The Storm Water Pollution Prevention Plan (SWPPP) for the project will detail the applications and type of measures and the allowable exposure of unprotected soils.
    - Discharge from dewatering operations, if needed, and runoff from disturbed areas will be made to conform to the water quality requirements of the waste discharge permit issued by the RWQCB.
    - Temporary erosion control measures, such as sandbagged silt fences, will be applied throughout construction of the proposed project and will be removed after the working area is stabilized or as directed by the engineer. Soil exposure will be minimized through use of temporary BMPs, groundcover, and stabilization measures. Exposed dust-producing surfaces will be sprinkled daily, if necessary, until wet; this measure will be controlled to avoid producing runoff. Paved streets will be swept daily following construction activities.
    - The contractor will conduct periodic maintenance of erosion and sediment control measures.
    - An appropriate seed mix of native species will be planted on disturbed areas upon completion of construction.
    - Cover or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more) that could contribute sediment to waterways.
    - Enclose and cover exposed stockpiles of dirt or other loose, granular construction materials that could contribute sediment to waterways. Material stockpiles will be located in non-traffic areas only. Side slopes will not be steeper than 2:1. All stockpile areas will be surrounded by a filter fabric fence and interceptor dike.
    - Contain soil and filter runoff from disturbed areas by berms, vegetated filters, silt fencing, straw wattle, plastic sheeting, catch basins, or other means necessary to prevent the escape of sediment from the disturbed area.
    - Use other temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary re-vegetation or other ground cover) to control erosion from disturbed areas as necessary.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

- Avoid earth or organic material from being deposited or placed where it may be directly carried into the channel.

Implementation of the above BMPs would ensure that water quality impacts to the Watsonville Slough and its tributaries are less than significant.

4. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding, on- or off-site?	☐	☐	☒	☐

***Discussion*:** Although the proposed project would alter the existing drainage patterns of the site, it would not increase the rate or amount of surface water runoff. Stormwater flows are conveyed by the ditch located south of the site. This ditch would be avoided during project construction. The proposed project would have no impact on flooding on- or off-site. Impacts would be less than significant.

5. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems, or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒

***Discussion*:** The proposed project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. Stormwater from agricultural fields south of the site may flow into the wetland habitat. There would be no impact to stormwater runoff volumes or sources.

6. Otherwise substantially degrade water quality?	☐	☐	☒	☐

***Discussion*:** The proposed project would not substantially degrade water quality as there would be no increase in impervious surface. Restoration and enhancement of wetland habitat would result in improved water quality conditions. Construction of the proposed project could release sediment and other pollutants that could migrate to surface waters. The grading and other activities would be required to perform under a SWPPP prepared in conformance with requirements of SWRCB's "General Permit for Discharges of Storm water Associated with Construction Activities (General Permit)." The General Permit presents a very specific process for construction projects to comply with the CWA's provisions that relate to the control of pollutant discharge from "nonpoint" sources. The General Permit provides for compliance with the regulations through submittal of a Notice

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

of Intent to comply with the format and content of the process developed for the General Permit, which includes development and implementation of a SWPPP.

Construction impacts on water quality would be minimized through implementation of a SWPPP. Also see discussion under I-3 above. Impacts would be less than significant.

7. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒

***Discussion*:** Although the project site is located within a 100-year flood hazard area as mapped on Flood Insurance Rate Map (FEMA 2013), implementation of the project would not involve placement of any new housing or structures within a 100-year flood hazard area. Therefore the project would have no impact on flood hazards associated with housing.

8. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒

***Discussion*:** Although the project site is located within the 100-year floodplain, wetland restoration activities would not substantially impede or redirect flood flows as the culverts that carry flows west from the site would not be altered. Restoration and protection of wetland habitat within the project site would provide a beneficial impact on surrounding residences and agricultural fields by providing a designated wetland available to capture and store flood waters. Construction and operation of the proposed project would have no adverse impact on flood flows.

9. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐

Discussion: Construction of the proposed project would not expose workers to risk of loss, injury or death involving flooding because even if the culverts (or upstream dams) were to fail, flooding at the site would be gradual and not result in loss, injury or death. Rail lines and upland areas provide access to and from the site when it is inundated. The risk associated with this impact is low and potential significance of this impact would be less than significant.

10. Inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

***Discussion*:** Tsunamis are triggered in a body of water by a sudden movement, such as a

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

large-scale slump or slide, which is often caused by earthquakes, movement of the oceans crust, or large explosions. Tsunamis have extremely long wave periods and wavelengths and can travel at great speeds. The project site is located approximately 2 miles inland from the Pacific Ocean and within a 0-5 meter tsunami inundation zone (2005 Op Area Emergency Management Plan). A tsunami generated by a Richter magnitude 6.8+ earthquake on the San Gregorio fault could arrive just minutes after the initial shock.

The lack of warning time from such a nearby event would result in higher causalities than if it were a distant tsunami where the Tsunami Warning System for the Pacific Ocean could warn threatened coastal areas in time for evacuation (County of Santa Cruz 2010). Although unlikely, construction of the project could expose workers to inundation by tsunami if one were to occur during the construction window. The risk associated with this impact is low and potential significance of this impact would be less than significant.

J. LAND USE AND PLANNING

Would the project:

1.	*Physically divide an established community?*	☐	☐	☐	☒

Discussion: The project site is owned by the Land Trust and the property is generally bound on the south by West Beach Street, on the east by Highway 1, on the west by San Andreas Road, and on the north by Harkins Slough Road (Figure 1). Apart from the rural residential uses, the area surrounding the project site is used for agricultural uses. There is no established community in the vicinity of the project site. Therefore, the project would not divide an established community. No impact would occur.

2.	*Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?*	☐	☐	☒	☐

Discussion: The proposed project would conform to the applicable land use plans, policies and regulations either through project design or with the implementation of mitigation measures. The project would be consistent with the applicable policies and objectives in the General Plan and would comply with all applicable zoning and land use ordinances in the SCCC.

General Plan/Local Coastal Program

The site of the proposed project is designated for Agriculture under the Santa Cruz County

General Plan (Santa Cruz County 1994). Commercial Agricultural land within the Agriculture General Plan designation is [intended to be maintained exclusively for long-term commercial agricultural uses]. The Agricultural designation restricts uses that are incompatible with commercial agriculture, such as high density residential development. The proposed project is consistent with the Agriculture General Plan land use designation because it would ultimately absorb excess nitrogen being released into surface waters and shallow groundwater from surrounding croplands. Excess nitrogen can cause eutrophication of habitat and ecologic impacts when discharged into surface waters, especially estuaries such as the Pajaro River Lagoon. The project would also provide minor floodwater overflow that may provide some flood relief to nearby croplands.

The proposed project would support a number of other General Plan policies and objectives, as follows:

Objective 5.1 Biological Diversity: To maintain the biological diversity of the County through an integrated program of open space acquisition and protection, identification and protection of plant habitat and wildlife corridors and habitats, low-intensity and resources compatible land uses in sensitive habitats and mitigations on projects and resources extraction to reduce impacts on plant and animal life.

- Policy 5.1.1 Sensitive Habitat Designation - Designate the following areas as sensitive habitats: (a) areas shown on the County General Plan and LCP Resources and Constraints Maps; (b) any undesignated areas which meet the criteria (policy 5.1.2) and which are identified through the biotic review process or other means; and (c) areas of biotic concern as shown on the Resources and Constraints Maps which concentrations of rare, endangered, threatened or unique species.
- Policy 5.1.2 Definition of Sensitive Habitat - An area is defined as a sensitive habitat if it meets one or more of the following criteria:

  (a) Areas of special biological significance as identified by the State Water Resources Control Board.

  (b) Areas which provide habitat for locally unique biotic species/communities, including coastal scrub, maritime chaparral, native rhododendrons and associated Elkgrass, mapped grasslands in the coastal zone and sand parkland; and Special Forests including San Andreas Live Oak Woodlands, Valley Oak, Santa Cruz Cypress, indigenous Ponderosa Pine, indigenous Monterey Pine and ancient forests.

  (c) Areas adjacent to essential habitats of rare, endangered or threatened species is defined in (e) and (f) below.

  (d) Areas which provide habitat for Species of Special Concern as listed by the California Department of Fish and Game in the Special Animals List, Natural

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Diversity Database.

(e) Areas which provide habitat for rare or endangered species which meet the definition of Section 15380 of the California Environmental Quality Act Guidelines.

(f) Areas which provide habitat for rare, endangered or threatened species as designated by the State Fish and Game Commission, United States Fish and Wildlife Service, or California Native Plant Society.

(i) All lakes, wetlands, estuaries, lagoons, streams and rivers.

(j) Riparian corridors.

- Policy 5.1.3 Environmentally Sensitive Habitats - Designate the areas described in 5.1.2 (d) through (j) as Environmentally Sensitive habitats per the California Coastal Act and allow only uses dependent on such resources in these habitats within the Coastal Zone unless other uses are:

  (a) consistent with sensitive habitat protection policies and serve a specific purpose beneficial to the public;

  (b) it is determined through environmental review that any adverse impacts on the resource will be completely mitigated and that there is no feasible less-damaging alternative; and

  (c) legally necessary to allow a reasonable economic use of the land, and there is no feasible less-damaging alternative.

- Policy 5.1.4 Sensitive Habitat Protection Ordinance - Implement the protection of sensitive habitats by maintaining the existing Sensitive Habitat Protection Ordinance. The ordinance identifies sensitive habitats, determines the uses which are allowed in and adjacent to sensitive habitats, and specifies required performance standards for land in or adjacent to these areas. Any amendments to this ordinance shall require a finding that sensitive habitats shall be afforded equal or greater protection by the amended language.

- Policy 5.1.6 Development within Sensitive Habitats - Sensitive habitats shall be protected against any significant disruption of habitat values; and any proposed development within or adjacent to these areas must maintain or enhance the functional capacity of the habitat. Reduce in scale, redesign, or, if no other alternative exists, deny any project which cannot sufficiently mitigate significant adverse impacts on sensitive habitats unless approval of a project is legally necessary to allow a reasonable use of the land.

- Policy 5.1.8 Chemicals within Sensitive Habitats - Prohibit the use of insecticides, herbicides, or any toxic chemical substance in sensitive habitats, except when an emergency has been declared, when the habitat itself is threatened, when a

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

substantial risk to public health and safety exists, including maintenance for flood control by Public Works, or when such use is authorized pursuant to a permit issued by the Agricultural Commissioner.

- Policy 5.1.9 Biotic Assessments - Within the following areas, require a biotic assessment as part of normal project review to determine whether a full biotic report should be prepared by a qualified biologist:

  (a) Areas of biotic concern, mapped;
  (b) Sensitive habitats, mapped & unmapped.

- Policy 5.1.10 Species Protection - Recognize that habitat protection is only one aspect of maintaining biodiversity and that certain wildlife species such as migratory birds, may not utilize specific habitats. Require protection of these individual rare, endangered and threatened species and continue to update policies as new information becomes available.

- Policy 5.13.3 Land Use Designations for Agricultural Resource Lands – All lands designated Agricultural Resource shall be maintained in an Agricultural Land Use designation, unless the property is included in a public park or biotic reserve and assigned as Parks, Recreation and Open Space (O-R), Resource Conservation (O-C), or Public Facility (P) land use designations.

- Policy 5.13.4 Zoning of Agricultural Resource Land – Maintain all lands designated as Agricultural Resource in the "CA", Commercial Agricultural Zone District, except for land in agricultural preserves zoned to the "AP", Agricultural Preserve Zone District or the "A-P", Agricultural Zone District and Agriculture Preserve Combining Zone District; timber resource land zone to be "TP", Timber Production Zone District; or public parks and biotic conservation areas zone to be "PR", Parks, Recreation and Open Space Zone District.

- Policy 5.13.5 Principal Permitted Uses on Commercial Agricultural (CA) Zone Land – Maintain a Commercial Agricultural (CA) Zone District for application to commercial agricultural lands that are intended to be maintained exclusively for long-term commercial agricultural uses. Allow principal permitted uses in the CA Zone District to include only agricultural pursuits for the commercial cultivation of plant crops, including food, flower, and fiber crops and raising of animals including grazing and livestock production and, outside the coastal zone, timber harvesting operations.

Zoning Ordinance

The proposed project site is zoned for Commercial Agriculture (CA) under the Zoning Ordinance of the Santa Cruz County Code. CA zoned lands are specifically reserved for

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

commercial agricultural pursuits such as the cultivation of plant crops, commercial raising of animals for grazing and livestock, and apiculture. Most CA zoned lands are also designated as an Agricultural Resource Type in the County General Plan. The Agricultural Resource designation identifies the quality of soil on the parcel and level of agricultural viability based on soil type. Permitted uses and structures on CA zoned lands are limited to those associated with commercial agriculture production. Agricultural Viability Determinations are required to prove that the parcel is not viable agricultural land and to facilitate a rezoning out of CA or a land division. "Facilities for fish and wildlife enhancement and preservation" are principally permitted within the CA zone. (SCCC 13.10.312(B)) The proposed project, therefore, is consistent with the applicable zoning regulations for the project site.

Riparian Corridor and Wetlands Protection Ordinance

The Riparian Corridor and Wetlands Protection Ordinance is intended to minimize and eliminate any development activities in the riparian corridor, and preserve, protect, and restore riparian corridors for: (1) protection of wildlife habitat; (2) protection of water quality; (3) protection of aquatic habitat; (4) protection of open space, cultural, historical, archaeological and paleontological, and aesthetic values; (5) transportation and storage of floodwaters; (6) prevention of erosion; and (7) to implement the policies of the General Plan and the Local Coastal Program Land Use Plan.

Sensitive Habitat Protection Ordinance

The Sensitive Habitat Protection Ordinance is intended to minimize disturbance of biotic communities which are rare or especially valuable because of their special nature or role in an ecosystem, and which could be easily disturbed or degraded by human activity; to protect and preserve these biotic resources for their genetic, scientific, and educational values; and to implement policies of the General Plan and the Local Coastal Program Land Use Plan.

Impacts would be considered less than significant.

3.	*Conflict with any applicable habitat conservation plan or natural community conservation plan?*	☐	☐	☐	☒

Discussion: The project does not conflict with any applicable habitat conservation plans or natural community conservation plans. No impact would occur.

K. MINERAL RESOURCES

Would the project:

1.	*Result in the loss of availability of a known mineral resource that would be of value to*	☐	☐	☐	☒

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

the region and the residents of the state?

***Discussion*:** The site does not contain any known mineral resources that would be of value to the region and the residents of the state. Therefore, no impact is anticipated from project implementation.

2. *Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?*	☐	☐	☐	☒

***Discussion*:** The project site is zoned Commercial Agriculture, which is not considered to be an Extractive Use Zone (M-3) nor does it have a Land Use Designation with a Quarry Designation Overlay (Q) (County of Santa Cruz 1994). Therefore, no potentially significant loss of availability of a known mineral resource of locally important mineral resource recovery (extraction) site delineated on a local general plan, specific plan or other land use plan would occur as a result of this project. No impact would occur.

L. NOISE

Would the project result in:

1. *Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*	☐	☐	☐	☒

***Discussion*:** Construction activities associated with the proposed project would result in a temporary increase in noise from the operation of construction equipment (excavators and trucks) and construction workers at the project site. This increase in noise is expected to last for the duration of construction. Similarly, trucks and on-road vehicles would arrive at the project area via West Beach Road, the closest available access route. Residents on San Andreas Road are located 0.1-mile southwest of the project site and may experience increased noise levels during weekday, daylight (7:00 am to 7:00 pm) hours. The County of Santa Cruz does not have ordinance regulating construction noise. Per County Policy average hourly noise levels shall not exceed the General Plan threshold of 50 Leq during the day and 45 Leq during the night. Construction activities would not violate a local general plan or noise ordinance, or applicable standards of other agencies. No impact would occur.

2. *Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?*	☐	☐	☒	☐

Construction activities associated with the proposed project would result in a temporary increase in ambient noise levels due to heavy equipment and machinery. Occupational

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Safety and Health Administration regulations require that a project-specific health and safety plan be developed prior to any construction activities by the construction contractor to identify any noise levels that would expose workers and the general public to unsafe noise levels. Site- and project-specific, the health and safety plan would identify potential safety hazards in the construction area and would identify standard safety precautions to ensure worker health. The health and safety plan would also identify whom to contact in an emergency and the location of the nearest medical facility. Measures identified in the health and safety plan would be implemented to protect workers at the site. Therefore, this impact would be less than significant.

3.	*A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?*	☐	☐	☐	☒

***Discussion*:** Operation of the project would not result in an increase in ambient noise levels in the project vicinity. No permanent increase in ambient noise would result from the proposed project. No impact would occur.

4.	*A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?*	☐	☐	☒	☐

***Discussion*:** As mentioned in L-1 above, construction of the proposed project would result in a temporary increase in noise levels in the vicinity of the project. However, this increase in construction noise would be minor and short in duration (up to 4 months). Residents west of the project site may hear limited construction noise, though not unlike the noise typically generated by existing farming operations and surrounding agricultural activities. Because construction noise would be only slightly louder than the existing baseline conditions, it is anticipated that temporary and periodic increases in construction noise levels would be less than significant.

5.	*For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*	☐	☐	☐	☒

***Discussion*:** The project area is not located within 2 miles of a public airport or in an area with an airport land use plan. The closest private airstrip to the project is the Monterey Bay Academy Airport, which is located 2.5 miles northwest of the project site. The closest public airport is Watsonville Municipal Airport, which is located 2.5 miles north of the

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

project site. Project activities would not expose people residing or working in the project area to excessive noise levels. No impact would occur.

6.	*For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?*	☐	☐	☐	☒

Discussion: The proposed project is not within two miles of a private airstrip. Therefore, the proposed project would not expose people residing or working in the project area. No impact is anticipated.

M. POPULATION AND HOUSING

Would the project:

1.	*Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?*	☐	☐	☐	☒

Discussion: The proposed project would not induce substantial population growth in an area because the project does not propose any physical or regulatory change that would remove a restriction to or encourage population growth in an area. The project proposes only to restore wetland and riparian habitat and would not induce population growth. No impact would occur.

2.	*Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?*	☐	☐	☐	☒

Discussion: The proposed project would not displace any existing housing. No impact would occur.

3.	*Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?*	☐	☐	☐	☒

Discussion: The proposed project would not displace a substantial number of people since the project is intended to restore wetland and riparian habitat. No impact would occur.

N. PUBLIC SERVICES

Would the project:

1. *Would the project result in substantial adverse physical impacts associated with*

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
a. Fire protection?	☐	☐	☐	☒
b. Police protection?	☐	☐	☐	☒
c. Schools?	☐	☐	☐	☒
d. Parks?	☐	☐	☐	☒
e. Other public facilities; including the maintenance of roads?	☐	☐	☐	☒

***Discussion (a through e)*:** The proposed project would not create any temporary or long-term demands on public services and there would be no new fire protection, police, schools, or other public facilities constructed to serve the proposed project. The intent of the project is to restore and enhance wetland and upland habitat in the ecosystem. The project would have no impact on public facilities or services.

O. RECREATION

Would the project:

1. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒

***Discussion*:** The project site is located entirely within land owned and managed by the Land Trust. No recreational access to the property would be provided. The closest public recreational resource is the Watsonville State Wildlife Area on Lee Road, which is located approximately 0.25 miles northeast of the project site. Recreational use near the project would not be exposed to excessive noise or disturbance during construction, as the surrounding area is used for agricultural activities and farming operations. The proposed project would not result in an increase in the use of this wildlife area, or any other existing neighborhood and regional park. No impact would occur.

2. Does the project include recreational facilities or require the construction or	☐	☐	☐	☒

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

expansion of recreational facilities which might have an adverse physical effect on the environment?

Discussion: The project as proposed does not include construction or expansion of recreational facilities. The project would have no impact on the environment as a result of constructing or expanding recreational facilities.

P. TRANSPORTATION/TRAFFIC

Would the project:

1.	*Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?*	☐	☐	☒	☐

Discussion: The proposed project would require daily access by up to 10 construction workers to the project site for up to 4 months. Construction vehicles would use West Beach Road off of Highway 1 to access the property, and existing paved and dirt roads within the vicinity of the project site to access the site. Construction traffic to the project site is expected to be limited to a few trips a day at the peak. In addition, no more than 10 construction workers would drive to the construction site daily during the construction period. Therefore, project traffic would not impact traffic on Highway 1 or other roads in the vicinity of the project. Anticipated traffic would not impact programs supporting alternative transportation. This impact would be less than significant.

2.	*Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?*	☐	☐	☐	☒

Discussion: In 2000, at the request of the Santa Cruz County Regional Transportation Commission (SCCRTC), the County of Santa Cruz and other local jurisdictions exercised the option to be exempt from preparation and implementation of a Congestion Management Plan (CMP) per Assembly Bill 2419. As a result, the County of Santa Cruz no longer has a Congestion Management Agency or CMP. The CMP statutes were initially established to

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

create a tool for managing and reducing congestion; however, revisions to those statutes progressively eroded the effectiveness of the CMP. There is also duplication between the CMP and other transportation documents such as the Regional Transportation Plan (RTP) and the Regional Transportation Improvement Program (RTIP). In addition, the goals of the CMP may be carried out through the Regional Transportation Improvement Program and the Regional Transportation Plan. Any functions of the CMP which are useful, desirable and do not already exist in other documents may be incorporated into those documents.

The proposed project would not conflict with either the goals and/or policies of the RTP or with monitoring the delivery of state and federally-funded projects outlined in the RTIP. No impact would occur.

3.	*Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?*	☐	☐	☐	☒

***Discussion*:** No change in air traffic patterns would result from project implementation. Therefore, no impact is anticipated.

4.	*Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*	☐	☐	☐	☒

***Discussion*:** The proposed project consists of the restoration of wetland, riparian and associated upland habitat. No increase in hazards would occur from project design or from incompatible uses. No impact would occur from project implementation.

5.	*Result in inadequate emergency access?*	☐	☐	☐	☒

***Discussion*:** The proposed project would not restrict emergency access for police, fire, or other emergency vehicles. No impact would occur from project implementation.

6.	*Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?*	☐	☐	☐	☒

***Discussion*:** The proposed project design would comply with current road requirements to prevent potential hazards to motorists, bicyclists, and/or pedestrians. No impact would occur.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Q. UTILITIES AND SERVICE SYSTEMS

Would the project:

1. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒

***Discussion*:** The proposed project would not generate wastewater. Therefore, wastewater treatment requirements would not be exceeded. No impacts would occur.

2. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

***Discussion*:** The proposed ecological restoration project would not require water or wastewater treatment. No impacts are expected to occur.

3. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

***Discussion*:** The proposed ecological restoration project would not generate increased runoff; therefore, it would not result in the need for new or expanded drainage facilities. No impact would occur.

4. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒

***Discussion*:** In the event of a dry year, the project includes an irrigation component, which may be required for areas with young transplants or under drought conditions. If large scale irrigation is needed, then irrigation of container stock may be conducted with sprinklers and/or drip irrigation by pumping groundwater from the well on site, or that of a neighboring farm. A water truck may also be used for irrigation. As a result, the proposed project would have adequate water supplies available to serve the project from existing entitlements. No impact is anticipated.

5. Result in determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected	☐	☐	☐	☒

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

demand in addition to the provider's existing commitments?

Discussion: The proposed project would only use small amounts of water during construction for dust control and for irrigation during the plant establishment period. No wastewater would be generated. No impacts are expected to occur from project implementation.

6.	*Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?*	☐	☐	☐	☒

Discussion: The proposed project would not generate solid waste during the operational phase of the project. However, small amounts of construction debris may be generated during site preparation and grading. No impact is anticipated.

7.	*Comply with federal, state, and local statutes and regulations related to solid waste?*	☐	☐	☐	☒

Discussion: The project would comply with all federal, state, and local statutes and regulations related to solid waste disposal. No impact would occur.

R. MANDATORY FINDINGS OF SIGNIFICANCE

1.	*Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?*	☐	☒	☐	☐

Discussion: The potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory were considered in the response to each question in Section III (A through Q) of this Initial Study. Resources that have been evaluated as significant would be potentially impacted by the project,

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

particularly Air Quality, Biological Resources, and Cultural Resources. However, mitigation has been included that clearly reduces these effects to a level below significance. These mitigation measures include best management practices to avoid air quality and water quality impacts, measures to avoid impacts to nesting birds, western pond turtle, California red-legged frog, and measures to protect cultural resources in the event of a discovery. As a result of this evaluation, there is no substantial evidence that, after mitigation, significant effects associated with this project would result. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

2. *Does the project have impacts that are individually limited, but cumulatively considerable? ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?*	☐	☒	☐	☐

***Discussion*:** In addition to project specific impacts, this evaluation considered the projects potential for incremental effects that are cumulatively considerable. As a result of this evaluation, there were no potentially significant cumulative effects related to Air Quality, Biological Resources, and Cultural Resources. However, mitigation has been included that clearly reduces these cumulative effects to a level below significance. As a result of this evaluation, there is no substantial evidence that there are cumulative effects associated with this project. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

3. *Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?*	☐	☒	☐	☐

***Discussion*:** In the evaluation of environmental impacts in this Initial Study, the potential for adverse direct or indirect impacts to human beings were considered in the response to specific questions in Section III (A through Q). As a result of this evaluation, there were determined to be potentially significant effects to human beings related to the following: Air Quality and Cultural Resource. However, mitigation has been included that clearly reduces these effects to a level below significance. As a result of this evaluation, there is no substantial evidence that, after mitigation, there are adverse effects to human beings associated with this project. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

IV. REFERENCES USED IN THE COMPLETION OF THIS INITIAL STUDY

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Attachment 1

Mitigation Monitoring and Reporting Program

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County of Santa Cruz

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KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR

MITIGATION MONITORING AND REPORTING PROGRAM for the BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION PROJECT

Application No. 141216, January 19, 2016

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
Air Quality					
AQ-1	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	Contracted Diesel Control Measures: In addition to the use of Tiered engines and California ultralow sulfur diesel fuel, the following requirements will be incorporated into contract specifications: • To minimize potential diesel odor impacts on nearby receptors (pursuant to MBUAPCD Rule 402, Nuisances), construction equipment will be properly tuned. A schedule of tune-ups will be developed and performed for all equipment operating within the project area. A written log of required tune-ups will be maintained and a copy of the log will be submitted to the County of Santa Cruz Department of Public Works (DPW) Planning Director for review every 2,000 service hours. • Fixed temporary sources of air emissions (such as portable pumps, compressors, generators, etc.) will be electrically powered unless the contractor submits documentation and receives written approval from the County of Santa Cruz DPW that the use of such equipment is not practical, feasible, or available (generally contingent upon power line proximity, capacity, and accessibility). California ultralow sulfur diesel fuel with maximum sulfur content of 15 ppm by weight (ppmw S), or an approved alternative fuel, will be used for on-site fixed equipment not using line power. • To minimize diesel emission impacts, construction contracts will require off-road compression ignition equipment operators to reduce unnecessary idling with a 2-minute time limit, subject to monitoring and written documentation. • On-road material hauling vehicles will shut off engines while queuing for loading and unloading for time periods longer than 2 minutes, subject to monitoring and written documentation. • Off-road diesel equipment will be fitted with verified diesel emission control systems (e.g., diesel oxidation catalysts) to the extent reasonably and economically feasible. • Utilize alternative fuel equipment (i.e., compressed or liquefied natural gas, biodiesel, electric) to the extent reasonably and economically feasible. Feasibility will be determined consistent with Best Available Control Technology (BACT) general criteria: 1) achieved in practice; 2) contained in adopted control measures; 3) technologically feasible; and 4) cost-effective.	The Land Trust and Contractor	Will be included in contract specifications, and the Planning Department staff will coordinate with the contractor to ensure compliance with BACT.	Prior to and during construction activities.
AQ-2		Diesel Particulate Matter Emissions Control Measures: In addition, the project will implement the following measures to reduce particulate matter emissions from diesel exhaust:	The Land Trust and Contractor	The Planning Department staff will coordinate with the	During construction activities.

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
		• Grid power will be used instead of diesel generators where it is feasible to connect to grid power (generally contingent upon power line proximity, capacity, and accessibility). • The project specifications will include 13 CCR Sections 2480 and 2485, which limit the idling of all diesel-fueled commercial vehicles (weighing over 10,000 pounds, both California- or non-California-based trucks) to 30 seconds at a school or 5 minutes at any location. In addition, the use of diesel auxiliary power systems and main engines will be limited to 5 minutes when within 100 feet of homes or schools while the driver is resting. • The project specifications will include 17 CCR Section 93115, Airborne Toxic Control Measure for Stationary Compression Ignition Engines, which specifies fuel and fuel additive requirements; emission standards for operation of any stationary, diesel-fueled, compression-ignition engines; and operation restrictions within 500 feet of school grounds when school is in session. • A schedule of low-emissions tune-ups will be developed and such tune-ups will be performed on all equipment, particularly for haul and delivery trucks. • Low-sulfur (≤ 15 ppmw S) fuels will be used in all stationary and mobile equipment.		Land Trust and contractor to ensure compliance.	
AQ-3		Dust Control Measures: The following controls will be implemented at the construction and staging sites as applicable: • Water all active construction areas at least twice daily as necessary and indicated by soil and air conditions. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard. • Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites. • Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. • All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, will be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover. • All on-site unpaved roads and off-site unpaved access roads will be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant. • All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities will be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking. • When materials are transported off site, all material will be covered, or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container will be maintained. • All operations will limit or expeditiously remove the accumulation of mud	The Land Trust and Contractor	Planning Department staff will coordinate with the Land Trust and contractor to ensure compliance.	During construction activities.

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
		or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.) • Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles will be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant. • Within urban areas, trackout will be immediately removed when it extends 50 or more feet from the site and at the end of each workday. • Any site with 150 or more vehicle trips per day will prevent carryout and trackout. • Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more). • Enclose, cover, water twice daily, or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 miles per hour. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than 1 percent. • Replant vegetation in disturbed areas as quickly as possible. • Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site. • Install wind breaks at windward side(s) of construction areas. • Suspend excavation and grading activity when winds (instantaneous gusts) exceed 20 miles per hour. • Limit the area subject to excavation, grading, and other construction activity at any one time.			
Biological Resources					
Nesting Bird Species Impact Avoidance Measures					
BIO-1	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service?	**Conduct Preconstruction Surveys and Implement Minimization and Avoidance Measures in Suitable Habitat for Nesting Bird Species, if Present** If removal of vegetation prior to the onset of construction begins during the bird nesting season (February 1st to August 1st), then a preconstruction nesting bird surveys will be conducted by a qualified biologist. The survey will be conducted within suitable nesting habitat no more than two weeks prior to construction activities. If no active nests are found within the vicinity of the project sites, no further mitigation is necessary. If active nests (i.e., nests in the egg laying, incubating, nestling or fledgling stages) are found within 300-feet of proposed activities, then the following steps would be implemented: 1. If active nests are found within 300 feet of the disturbance footprint for raptor (birds of prey) species or 100 feet of the disturbance footprint for all other bird species, no-disturbance buffers should be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover, the nesting pair's tolerance to disturbance, and the	The Land Trust, Contractor, and Project Biologist	To be monitored by the County Planning Department, the Land Trust, Contractor, and the Project Biologist.	To be implemented prior to and during project construction.

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
		type/duration of potential disturbance. Work within no-disturbance buffers should be rescheduled to occur after the young have fledged as determined by a qualified biologist. 2. If rescheduling of work is infeasible and no-disturbance buffers cannot be maintained, a qualified biologist should be on site to monitor active nests for signs of disturbance. If it is determined that project-related activities are resulting in nest disturbance, work should cease immediately and the California Department of Fish and Wildlife (CDFW) and USFWS should be contacted for further guidance. 3. Construction activities conducted outside of the breeding season (i.e., August 2nd to January 29th) would not require preconstruction nesting bird surveys or establishment of no-disturbance buffers.			
Western Pond Turtle Impact Avoidance Measures					
BIO-2	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service?	**Conduct Preconstruction Survey for Western Pond Turtle and Install Wildlife Exclusion Fencing** Immediately prior to the onset of construction activities, a qualified biologist would conduct a pre-construction survey within Watsonville Slough to determine the presence or absence of western pond turtle. If turtles are present, the following measure would be implemented: The construction contractor or project sponsor would install protective temporary fencing, or Wildlife Exclusion Fencing (see Mitigation Measure BIO-4), to prevent the migration of western pond turtles into the work area. The placement and installation of the fencing would be approved by a qualified biologist prior to commencement of construction activities. Wildlife Exclusion Fencing would be designed not to impede the movement of wildlife to and from the slough and would be maintained for the duration of construction, and would be removed following completion of the project.	The Land Trust, Contractor, and Project Biologist	To be monitored by the County Planning Department, the Land Trust, Contractor, and the Project Biologist.	To be implemented prior to and during project construction.
Water Quality and Erosion Control Best Management Practices					
BIO-3	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service? Have a substantial adverse effect on any	See attached Table 7 – Related Best Management Practices.	The Land Trust, Contractor, and Project Biologist	To be monitored by the County Planning Department, the Land Trust, Contractor, and the Project Biologist.	To be implemented prior to and during project construction.

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	riparian habitat or sensitive natural community identified in local or regional plans, policies, regulations (e.g., wetland, native grassland, special forests, intertidal zone, etc.) or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				
California Red-legged Frog Impact Avoidance Measures					
BIO-4	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service?	**Compliance with USFWS Biological Opinion for proposed project. Conservation Measures may include any/all of the following:** <u>California Red-legged Frog Protective Measures</u> 1. The Land Trust will ensure that the Service-approved biologist or designated monitor will be given full authority to stop work if the avoidance and minimization measures listed below are not being followed. If work is stopped, the Service will be notified immediately. 2. A Service-approved biologist will conduct a pre-construction survey of the project site no sooner than 48 hours prior to onset of work activities. If any life stage of California red-legged frog is found and an individual(s) is likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move the individual(s) from the site before work activities begin. The Service-approved biologist will relocate such California red-legged frog(s) the shortest distance possible to a location that contains suitable habitat and that will not be affected by activities associated with the project. The Service-approved biologist will maintain detailed records of any California red-legged frog(s) that is relocated (e.g., size, coloration, any distinguishing features, and photographs) to assist in determining whether a translocated individual(s) is returning to the	The Land Trust, Contractor, and Project Biologist	To be monitored by the County Planning Department, the Land Trust, Contractor, and the Project Biologist.	To be implemented prior to and during project construction.

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
		original point of capture. 3. Prior to construction activities, a Service-approved biologist will conduct an Employee Education Program for the construction crew. The biologist will meet with the construction crew prior to the onset of construction to educate the construction crew on the following: (1) a review of the project boundaries, including staging areas and access routes; (2) the special-status species that may be present, their habitat, and proper identification; (3) how to avoid any special-status species that is encountered within the project site and report its presence to the Service- approved biologist; and (4) these avoidance and minimization measures as prescribed in this biological assessment. 4. A Service-approved biologist will be present at the work site until all ground-disturbing activities are completed. After this time, the Service-approved biologist will monitor the project area for compliance with all avoidance and minimization measures, or the Service-approved biologist will designate a person to monitor the project area for compliance with all avoidance and minimization measures if the Service-approved biologist will not be present. The Service- approved biologist will ensure that this monitor receives sufficient training in the identification of California red-legged frogs. The designated monitor must have experience and a background in natural resources. 5. On any day that ground-disturbing activities, mowing or weed whacking, or herbicide spraying are planned to occur, a Service-approved biologist will conduct a survey for California red-legged frogs in potentially affected areas before the work begins. If any life stage of California red- legged frog is found and an individual(s) is likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move the individual(s) from the site before work activities begin. The Service-approved biologist will relocate such California red-legged frog(s) the shortest distance possible to a location that contains suitable habitat and that will not be affected by activities associated with the project. The Service-approved biologist will maintain detailed records of any California red-legged frog(s) that is relocated (e.g., size, coloration, any distinguishing features, and photographs) to assist in determining whether a translocated individual(s) is returning to the original point of capture. 6. If a California red-legged frog(s) is observed during ground-disturbing activities, the Service- approved biologist will stop work in that area. The Service-approved biologist will relocate the California red-legged frog as described above. 7. Ground-disturbing construction activities, herbicide applications, mowing and weed whacking will only occur during the period from May 1 through October 31 provided that standing water has been absent from the site for at least 30 days.			

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
		8. If standing water is anticipated to remain on the project site after June 15th during any year of the project, the Land Trust will contact the Service for approval to conduct spraying, mowing or weed whacking, if needed to prevent seed set of non-native plants. Under these circumstances, the Land Trust will seek approval from the Service at least 2 weeks in advance of the desired start of any mowing or weed whacking. At that time the Land Trust and Service will discuss the need for additional conservation measures. Additional conservation measures could potentially include the following: (1) work will only occur if no California red-legged frogs are found during a pre-activity survey conducted by a Service-approved biologist; (2) a clearly demarcated buffer area of at least 50 feet will be established around any standing water; (3) only weed whacking and hand-pulling could occur within the buffer area; (4) the Service-approved biologist will remain onsite when any activities are conducted within the buffer area; (5) the Service-approved biologist will stop all work if a California red-legged frog(s) is found on the project site; (6) the Land Trust will ensure the vegetation height is not cut below 18 inches within the buffer area; and/or (7) no activities will occur within standing water. Once the project site has been free of standing water for at least 30 days, mowing or weed whacking could continue without the need for additional conservation measures. If mowing or weed whacking is not approved by Service when standing water is present, then no mowing or weed whacking will occur until there is no standing water for at least 30 days. 9. To prevent inadvertent entrapment of California red-legged frogs during the proposed project, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered at the close of each working day with plywood or similar materials. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. 10. If silt fencing is required per erosion control Best Management Practices, only high-quality reinforced silt fencing will be used and efforts will be made to install it in a way that does not inhibit movements of California red-legged frogs. Openings will be created approximately every 100 feet. 11. Cleaning and refueling of equipment and vehicles will occur only within designated staging areas on previously paved or graded parking areas. All herbicides, fuels, lubricants, and equipment will be stored, poured, or refilled at least 50 feet from wetland habitat, riparian habitat or water bodies in a location where a spill will not drain directly toward aquatic habitat. No maintenance or cleaning of equipment will occur within wetland or riparian areas, or within 50 feet of such areas. All equipment and vehicles will be checked and maintained on a daily basis to ensure proper operation and avoid potential leaks or spills. 12. During construction, all project-related spills of hazardous materials			

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
		within or adjacent to the project site will be cleaned up immediately. Spill prevention and clean-up materials will be onsite at all times during construction. Construction materials/debris will also be stored within the designated staging areas. No debris, soil, silt, sand, oil, petroleum products, cement, concrete, or washings thereof will be allowed to enter into, or be placed where they may be washed by rainfall or runoff, into wetland or riparian habitats. 13. Prior to the onset of work, the NRCS will ensure that a plan is in place for a prompt and effective response to accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur. 14. Only a licensed herbicide contractor with experience working on habitat restoration sites along the Central California Coast will perform all applications of herbicides. 15. Herbicide application will be made in accordance with label recommendations. The Land Trust and the licensed herbicide contractor will implement the pesticide best management practices described in (See Attachment 8, Appendix B). Persons applying herbicide will wear all required personal protective equipment and follow safety protocols and measures. 16. Only those herbicides or surfactants specifically identified in the project description will be used. 17. Containers of herbicide (concentrated or diluted) will be under direct supervision of the herbicide applicator at all times. 18. Sprayers, chemicals, and mixing equipment for herbicides will be contained in non-tip, leak- proof containers at all times, except when contents are being used or accessed. 19. Only enough herbicide will be mixed for the immediate application; however, if there is excess, the herbicide will be disposed of according to Environmental Protection Agency and California Department of Pesticide Regulation regulations. 20. Herbicides used at the site will be used according to all best management practices, precautions, and recommendations listed on the label. To reduce potential impacts of spraying operations on California red-legged frog, no herbicide applications will occur on the project site within 30 days of the last standing water within the swale system. One treatment per year for the first two years will be accomplished using boom spray equipment attached to an ATV or wheeled tractor. However, for all herbicide applications, precedence will be given to spot treatments (with the use of marking dye) over full-coverage applications; minimizing the potential harmful effects to wildlife and the environment. 21. Herbicide applications will not occur in wind conditions exceeding 7 miles per hour or when rain is forecasted within 72 hours of treatment. 22. Only non-ionic surfactants (e.g. Agri-Dex) or surfactants that are not			

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
		toxic to fish and wildlife will be used on the project site. No surfactants containing polyehtoxylated tallowamine (POEA) will be used on the project site. 23. All trash that may attract predators will be properly contained, removed from the project site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas. 24. The Service-approved biologist(s) will follow the Declining Amphibian Populations Task Force's Code of Practice (See Attachment 8, Appendix C). The Service-approved biologist may substitute a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water) for the ethanol solution. <u>Additional Best Management Practices and Avoidance Measures</u> 1. <u>Seasonal Avoidance</u>. Construction and maintenance will be scheduled to minimize effects on listed species and habitats. All work will be conducted between April 15 and October 15, or, if allowed by regulatory agencies during permit acquisition, maintenance activities may be completed later in the season. No activities shall occur between October 15 or the onset of the rainy season, whichever occurs first, and May 1, except for during periods greater than 72 hours without precipitation. The National Weather Service (NWS) 72-hour forecast for the project area will be monitored. If a 70 percent or greater chance of rainfall is predicted within 72 hours of construction activity, all activities will cease until no further rain is forecast. If rain exceeds ¼ inch during a 24-hour period, work will cease until no further rain is forecast. Activities can only resume after site inspection by a qualified biologist. The rainy season is defined as a frontal system that results in depositing 0.25 inches or more of precipitation in one event. 2. <u>Night Work</u>. All construction activities will occur during daylight hours (sunrise to sunset). 4. <u>Environmentally Sensitive Habitat Area (ESHA) Fencing</u>. Prior to the start of construction, Environmentally Sensitive Habitat Areas – defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed – will be clearly delineated using high visibility orange fencing. Construction work areas include the active construction site and all areas providing support for the proposed project, including areas used for vehicle parking, equipment and material storage and staging, access roads, etc. The fencing will remain in place while construction activities are ongoing, and will be regularly inspected and fully maintained at all times. The final project plans will depict all locations where ESHA fencing will be installed and will provide installation specifications. The bid solicitation package special provisions will clearly describe acceptable fencing material and prohibited construction-related activities including vehicle operation, material and equipment storage, access roads and other surface-			

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
		disturbing activities within Environmentally Sensitive Habitat Areas. In addition, hydrological features (i.e., topographic depressions, drainage ditches, culverts, etc.) outside of the proposed project footprint will not be manipulated (i.e., re-routed, dredged, filled, graded, etc.). This will avoid potential effects on wetlands and waters outside of the proposed project footprint that are hydrologically connected to aquatic features within the proposed project footprint. 5. Wildlife Exclusion Fencing (WEF). Prior to the start of construction, WEF will be installed at the edge of the project footprint in all areas where California red-legged frogs could enter the construction area. The location of the fencing shall be determined by the USFWS-approved biologist in cooperation with USFWS and CDFW prior to the start of staging or ground disturbing activities. The location, fencing materials, installation specifications, and monitoring and repair criteria shall be approved by USFWS prior to start of construction. The WEF shall remain in place throughout the duration of the project and shall be regularly inspected and fully maintained. Repairs to the WEF shall be made within 24 hours of discovery. Upon project completion the WEF shall be completely removed, the area cleaned of debris and trash, and returned to natural conditions. 6. Access and Staging. Vehicles to and from the proposed project site will be confined to existing roadways to minimize disturbance of upland habitat. Prior to movement of heavy construction equipment into the construction area, a USFWS-approved biologist will make sure the route is clear of amphibians. Staging of vehicles and equipment will be confined to a predetermined area. Prior to movement of heavy construction equipment into the construction area, the staging area will be clearly marked on construction drawings and biologists will supervise the installation of orange barrier fencing separating the staging area from adjacent Environmentally Sensitive Areas. Vehicle speeds will not exceed 15 miles per hour to avoid special-status species on or traversing the access road.			
Cultural Resources					
CUL-1	Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?	All ground disturbing activity in the project area shall be monitored by a qualified archaeologist in the event a substantial intact deposit is found within the property. Pursuant to Section 16.40.040 of the Santa Cruz County Code, if archaeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the notification procedures given in County Code Chapter 16.40.040.	The Land Trust and contractor	To be implemented by a qualified archaeologist.	To be implemented during project construction.

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
CUL-2	Disturb any human remains, including those interred outside of formal cemeteries?	Pursuant to Section 16.40.040 of the Santa Cruz County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this project, human remains are discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the sheriff-coroner and the Planning Director. If the coroner determines that the remains are not of recent origin, a full archeological report shall be prepared and representatives of the local Native California Indian group shall be contacted. Disturbance shall not resume until the significance of the archeological resource is determined and appropriate mitigations to preserve the resource on the site are established.	The Land Trust and contractor	To be implemented by a qualified archaeologist.	To be implemented during project construction.

Table 7: Construction-Related Best Management Practices		
BMP #	Name	BMP
BMP -1	Erosion Control and Construction-Related Turbidity	1. Traffic speeds on unpaved roads will be limited to 15 mph. 2. If dewatering is required during construction, such water will be discharged through a silt curtain or to vegetated upland areas with less than a one-percent slope and at least 200 feet from wetlands to filter and decant water removed during dewatering activities. 3. Sandbags or other erosion control measures will be employed to prevent runoff and construction-related turbidity. 4. Upland soils exposed due to construction activities will be stabilized using native or non-invasive seed and straw mulch. 5. Any erosion control fabric will consist of natural fibers that will biodegrade over time. No plastic or other non-porous material will be used as part of a permanent erosion control approach. 6. Other erosion control measures shall be implemented as necessary to ensure that sediment or other contaminants do not reach surface water bodies for stockpiled or reused/disposed sediments.
BMP -2	Staging and Stockpiling of Materials	1. All construction equipment will be staged in upland areas, away from sensitive natural communities or habitats. 2. All construction-related items, including equipment, stockpiled material, temporary erosion control treatments, and trash will be removed within 72 hours of project completion. All residual soils and/or materials will be cleared from the project site. 3. Building materials and other construction-related materials, including chemicals, will not be stockpiled or stored where they could spill into water bodies or storm drains, or where they could cover aquatic or riparian vegetation.
BMP - 3	Spill Prevention and Response Plan	A Spill Prevention and Response Plan will be developed prior to commencement of construction activities, and will summarize the measures described below. The work site will be routinely inspected to verify that the Spill Prevention and Response Plan is properly implemented and maintained. Contractors will be notified immediately if there is a noncompliance issue. 1. Equipment and materials for cleanup of spills will be available on site. 2. All spills and leaks will be cleaned up immediately and disposed of properly. 3. Prior to entering the work site, all field personnel shall be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills. 4. Field personnel shall implement measures to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means. 5. Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). All field personnel shall be advised of these locations and trained in their appropriate use. 6. Absorbent materials will be used on small spills located on impervious surfaces rather than hosing down the spill; wash waters shall not discharge to surface waters. For small spills on pervious surfaces such as soils, wet materials will be excavated and properly disposed of rather than buried. The absorbent materials will be collected and disposed of properly and promptly. 7. As defined in 40 CFR 110, a federal reportable spill of petroleum products is the spilled quantity that: ▪ violates applicable water quality standards; ▪ causes a film or sheen on, or discoloration of, the water surface or adjoining shoreline; or ▪ causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines. If a spill is reportable, the contractor's superintendent will notify the Land Trust and the Land Trust will take action to contact the appropriate safety and cleanup crews to ensure that the Spill Prevention and Response Plan is followed. A written description of reportable releases must be submitted to the appropriate RWQCB and the California Department of Toxic Substances Control (DTSC). This submittal must contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases will be documented on a spill report form. If an appreciable spill has occurred, and results determine that project activities have adversely affected surface water or groundwater quality, a detailed analysis will be performed to the specifications of DTSC to identify the likely cause of contamination. This analysis will include recommendations for reducing or eliminating the source or mechanisms of contamination. Based on this analysis, the Land Trust or contractors will select and implement measures to control contamination, with a performance standard that surface and groundwater quality must

Table 7: Construction-Related Best Management Practices		
BMP #	Name	BMP
		be returned to baseline conditions. These measures will be subject to approval by the Land Trust, DTSC, and the RWQCB.
BMP - 4	Equipment and Vehicle Maintenance and Cleaning	1. All vehicles and equipment will be kept clean. Excessive build-up of oil or grease will be prevented. 2. Vehicle and equipment maintenance activities will be conducted in a designated area to prevent inadvertent fluid spills from adversely impacting water quality. This area will be clearly designated with berms, sandbags, or other barriers. 3. Secondary containment, such as a drain pan or drop cloth, to catch spills or leaks will be used when removing or changing fluids. Fluids will be stored in appropriate containers with covers, and properly recycled or disposed of off-site. 4. Cracked batteries will be stored in a non-leaking secondary container and removed from the site. 5. Spill cleanup materials will be stockpiled where they are readily accessible. 6. Incoming vehicles and equipment will be checked for leaking oil and fluids (including delivery trucks and employee and subcontractor vehicles). Leaking vehicles or equipment will not be allowed on-site. 7. Vehicles and equipment will not be washed on-site. Vehicle and equipment washing will occur at an appropriate wash station.
BMP - 5	Refueling	1. All fueling sites shall be equipped with secondary containment and avoid a direct connection to underlying soil, surface water, or the storm drainage system. 2. For stationary equipment that must be fueled on-site, secondary containment such as a drain pan or drop cloth shall be provided in such a manner to prevent accidental spill of fuels to underlying soil, surface water, or the storm drainage system.
BMP -6	On-Site Hazardous Materials Management	1. The products used and/or expected to be used and the end products that are produced and/or expected to be produced after their use will be inventoried. 2. As appropriate, containers will be properly labeled with a "Hazardous Waste" label and hazardous waste will be properly recycled or disposed of off-site. 3. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers or in a storage shed (completely enclosed), with appropriate secondary containment to prevent any spillage or leakage. 4. Quantities of equipment fuels and lubricants greater than 55 gallons shall be provided with secondary containment that is capable of containing 110 percent of the volume of primary container(s). 5. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials shall not be allowed to enter receiving waters or the storm drainage system. 6. Sanitation facilities (e.g., portable toilets) will be surrounded by a berm, and a direct connection to the storm drainage system or receiving water will be avoided. 7. Sanitation facilities will be regularly cleaned and/or replaced, and inspected regularly for leaks and spills. 8. Waste disposal containers will be covered when they are not in use, and a direct connection to the storm drainage system or receiving water will be avoided. 9. All trash that is brought to a project site during construction activities (e.g., plastic water bottles, plastic lunch bags) will be removed from the site daily.
BMP - 7	Fire Prevention	1. All earthmoving and portable equipment with internal combustion engines will be equipped with spark arrestors. 2. During the high fire danger period (April 1–December 1), work crews will have appropriate fire suppression equipment available at the work site. 3. On days when the fire danger is high, flammable materials will be kept at least 10 feet away from any equipment that could produce a spark, fire, or flame. 4. On days when the fire danger is high, portable tools powered by gasoline-fueled internal combustion engines will not be used within 25 feet of any flammable materials unless at least one round-point shovel or fire extinguisher is within immediate reach of the work crew (no more 25 feet away from the work area).
BMP - 8	Work Site Housekeeping	1. The work site will be maintained in a neat and orderly condition, and left in a neat, clean, and orderly condition when work is complete. 2. Materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged.

Attachment 2

Bryant-Habert/Wait Ecological Restoration Design
60% Design Report

March 2014

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Bryant-Habert/ Wait Ecological Restoration Design

60% Design Report

prepared for

Resource Conservation District of Santa Cruz County

prepared by

WATERWAYS CONSULTING, INC.

with

March 2014

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Appendix D Concept Level Drawings (Various Alternatives)

1.0 INTRODUCTION

Waterways Consulting, Inc. (Waterways) has been hired by the Resource Conservation District of Santa Cruz County (RCD) as part of the Technical Team (Team) preparing ecological restoration designs to enhance approximately 28 acres of low lying land within the Watsonville Sloughs Complex, located at the confluence of Watsonville and Struve Sloughs. The project is located on land previously referred to as the "Bryant-Habert" and "Wait" parcels, which were recently acquired by the Land Trust of Santa Cruz County (Land Trust) as an addition to their Watsonville Slough Farms property.

In addition to Waterways and the RCD, the Team assembled by the RCD includes Watsonville Wetlands Watch (WWW), Alnus Ecological, Vinnedge Environmental, and the Land Trust of Santa Cruz County. The Team comprises a wide range of expertise, knowledge, and local experience, and has a strong track record of successful collaboration on similar projects.

The Team's design approach has been guided by broad goals outlined in the Watsonville Slough Farm Management Plan (WSF), completed by the RCD in 2011. Project-specific objectives and constraints were identified and refined during this throughout the project's planning and preliminary design phases, as outlined below.

This report presents the basis of design and 60% complete drawings (Appendix A) for the preferred project.

2.0 GOALS, OBJECTIVES AND CONSTRAINTS

2.1 Goals

The overarching goal of the project, as stated by the RCD, is "...providing maximum benefit to wetland protection, as well as addressing additional local and regional ecological goals for the Slough property as outlined by the larger Watsonville Slough Farms (WSF) Management Plan" within the boundaries of the Bryant-Habert/Wait parcels. The design team has collaborated to develop the following list of more specific project goals:

- Enhance regional biodiversity and under-represented habitat units within the slough system.
- Enhance system resilience to climatic and hydrologic change in a self-sustaining fashion.
- Increase the viability of agriculture in the area.
- Provide an aesthetic demonstration of ecologic restoration along the future Monterey Bay Sanctuary Trail.

2.2 Objectives

The project-specific objectives listed below were derived from the above-stated goals of the project, the grant proposal, multiple discussions with project partners and subsequent analysis and revision by the Team.

2.2.1 Habitat

- The project preserves and expands existing wet meadow habitat and seasonal marsh habitat as currently exists north of the Watsonville Slough channel on the Bryant-Habert parcel.
- The project avoids perennial open water habitat that supports bullfrogs and non-native fish.

- The design considers opportunities for enhancing regional biodiversity by promoting early successional habitats, while minimizing obligations for ongoing mechanical disturbance (maintenance).
- The design looks to expand upland refugia in close proximity to various seasonal and perennial wetland habitats.

2.2.2 Geomorphic Function

- The design incorporates landscape-scale resilience to changing climatic and hydrologic conditions by accommodating both variability and uncertainty: the design targets processes and broad habitat types rather than the narrow needs of specific species.
- The design fits into the larger landscape, ongoing disturbances, and the micro-scale patchiness.

2.2.3 Water Quality

- The project strives to improve water quality with an emphasis on treating agricultural tailwater/dry weather flows in focused areas, yielding larger areas with higher quality habitat.

2.2.4 Stewardship

- The future operations and maintenance costs associated with the project are low (i.e. self-sustaining with limited need for intervention.)
- The project is compatible with adjacent agriculture.
- The project provides an aesthetic demonstration of ecologic restoration.

2.3 Constraints

In addition to the stated goals and objectives, the 60% complete design drawings were developed with consideration for the following constraints. This list is not all-inclusive, but is meant to serve as a preliminary checklist for future consideration in development of final designs:

- Property boundaries
- Installation and maintenance costs
- Permit acquisition
- Construction phasing/access opportunities
- Flood conveyance impacts
- Need to maintain existing Watsonville Slough ditch
- Agriculture buffer concerns on adjacent lands
- Hydraulics at the railroad and culvert crossings
- Upland farming inputs of sediment, nutrients, etc.
- Existing underground utilities within the project area
- Presence of peat soils at unknown locations and depths throughout the site
- Railroad right-of-way management practices and drainage requirements
- Future vehicular access needs for maintenance, etc.
- Desire to avoid introduction of promotion of exotic invasive species
- Potential future public trail adjacent to and within project site
- Public safety

3.0 DESIGN PROCESS

3.1 Evaluation of Existing Conditions

In addition to our review of background data and reports, the following work was performed to further evaluate and compile existing conditions data prior to our initial Team meeting.

A topographic base map was created by compiling existing LIDAR mapping with supplemental cross sections of the slough ditch that were surveyed by Balance Hydrologics under a separate contract for the Watsonville Slough Hydrology Study (Hydrology Study, in progress). Waterways also used RTK-GPS to survey select cross sections and random spot elevations throughout the project area to confirm the accuracy of the LIDAR data. The LIDAR data was found to be of acceptable accuracy.

Record boundary information was overlain on the mapping, using data provided by Santa Cruz County. This information is approximate, and it will need be resolved prior to final design in locations where work is proposed near boundaries (e.g., near the railroad right of way).

During the field topographic mapping, Waterways and WWW performed a GPS survey of existing vegetation communities within the project area. This mapping was overlain on the project base map to inform the design effort. Specifically, this data was useful in establishing vegetation community-elevation relationships and in prioritizing areas to remain undisturbed by grading.

The NRCS Web Soil Survey defined the soils in the project area as Clear Lake Clay. Field investigation of onsite soils was conducted in February 2012. Three shallow hand-augured boreholes were dug with depths ranging from 3-4 feet below existing grade. The soil samples collected from the borings were uniformly fine grained and clay textured. Peat was not encountered in the boreholes at depths between 0 and 4 feet below ground which corresponds to the proposed depth of pond excavations. However, peat is present at the site and may be encountered during excavation.

3.2 Collaboration

A number of meetings were held throughout the design development, providing opportunities for Team collaboration. The first of these was a project kickoff meeting, held in August of 2012, where members of the Team and Coastal Conservancy staff met to review the project site and discuss goals, objectives, and timeline.

A design charette was then held in October 2012 with Team members, AmeriCorps staff, and a representative of the US Fish and Wildlife Service. Project goals and objectives were further refined, and restoration components were selected for inclusion in the concept–level design alternatives.

Following the charette, Waterways, WWW, and the Land Trust worked closely together through subsequent meetings and teleconferences to refine the project objectives, constraints, and conceptual design alternatives.

The Technical Advisory Committee (TAC) convened in December 2012 to review conceptual design alternatives and provide feedback.

The Team convened again in February 2013 and March 2013 to identify, refine, and develop the preferred design alternative.

The preferred alternative was then developed into Draft 60% Designs, which were submitted with a draft design report in May of 2013. The Draft 60% designs were reviewed internally and resulted in a

request for modifications to the revegetation plan. The revegetation plan was revised and resubmitted in February 2014. This final 60% Design Report incorporates these changes.

3.3 Conceptual Design Alternatives

Waterways prepared four concept level design alternatives, each presented in Appendix D. The components included or omitted in each alternative were constrained to some degree by a desire to present a range of alternatives reflecting varying degrees of grading, disturbance area, and revegetation and maintenance effort. Each of the alternatives was developed to balance cut and fill quantities on site, in an effort to minimize construction costs and impacts. Maximum finished grade slope angle was constrained to ten percent, to blend with surrounding slough topography and minimize the expense associated with temporary erosion control work. In response to comments and feedback from the TAC and further Team collaboration, the Team developed an additional alternative that would focus on closed basin depressions organized in clusters. The clusters were referred to as depression complexes and were comprised of several basins of varying depths within each complex. The depression complex concept was developed to reflect a range of potential grading opportunities that could be used to adaptively manage the enhancement area.

3.4 Preferred Design Alternative

The Team elected to proceed with an alternative that would focus on the development of four "depression complexes" that would each be graded to contain multiple small depressions of variable size, shape and depth. The locations and details of the depression complexes are shown schematically on the design drawings (Appendix A).

The total area of disturbance would be approximately 20 acres and include four acres reserved in the southeast corner for future drainage water recycling. The design was developed with the understanding that the locations and details of the features may be modified during construction, as directed by the owner's representative, to minimize disturbance to select vegetation communities and avoid peat soils that may be uncovered during grading activities. The design drawings represent the maximum amount of disturbance and grading that would occur on the project site. This work could be phased both spatially and temporally.

Maximum grades were constrained to ten percent slope with the exception of the berm running along the easterly property line. Depressions are shown with a minimum elevation of six feet and maximum depths of approximately four feet below natural grade, reflecting the desire to avoid perennial open water.

Inclusion of variable topography and gentle gradients (10h:1v maximum slope) helps to ensure that the project's performance is not tied to one specific elevation range, and will therefore exhibit resilience to future changes to the hydrologic setting, that may result from downstream modifications to hydraulic controls, land subsidence, climate change, or other factors beyond our control or ability to predict at this time.

3.4.1 Revegetation Plan

Vegetation communities have been correlated with the elevation ranges present and proposed on the site. Detailed revegetation plans were developed for the preferred alternative by WWW. The plans were incorporated into the 60% Design Drawings and are included in Appendix A. The Revegetation Plan Report is included in Appendix B.

3.4.2 Construction Cost Estimates

An engineer's estimate of probable construction costs related to grading and erosion control was prepared and is included as Appendix C. Unit costs are based on bids received for similar work, factored by engineering judgment related to issues such as site access and dewatering difficulties. The estimated costs of revegetation and associated management and maintenance activities were developed by WWW and are included in Appendix B. These costs will vary depending on the method of planting that is selected.

The grading and related erosion control measures represent the greatest upfront costs, estimated at roughly $257,000. A contingency of 25% was applied to all costs in order to bracket the many details yet to be refined as plans move through permitting and toward completion. In addition to these unknowns, bid costs are greatly affected by things like timing, contracting terms, and the general climate of the construction industry at the time of bid.

3.4.3 Implementation Considerations

Balanced Grading

The grading plan was developed with a goal of balancing the cut and fill quantities on site, to minimize cost and offsite impacts. The designs show a total cut volume of approximately 11,200 cubic yards, with a corresponding fill. These numbers reflect neat line quantities and have not been factored to reflect compaction or shrinkage. Where peat soils are encountered, compaction may be significant. The design incorporates flexibility to accommodate such variation by placing a significant percentage of this excess material within areas that are not critical to the function of the project (e.g., the southeast corner of the parcel). The design drawings are representative of the maximum potential volume of grading that may occur.

Water Management and Water Quality Protection

We do not anticipate any challenges related to dewatering or erosion and sediment control. All work is located above the anticipated slough water level at the time of construction. The majority of the work areas are internally drained, which greatly facilitates dewatering and erosion/sediment control. If groundwater is encountered in excavations, work may progress at a pace that allows for proper treatment techniques to be implemented given that water will not be draining off site.

The contractor will be required to comply with all environmental protection measures contained in the project specifications and permit conditions, including preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP). Construction should take place during mid-summer to early fall when the surface inundation and groundwater elevations are at a minimum. Discharge of water encountered in the excavations would be performed in a manner that will prevent excessive turbidity from discharging into the slough channel. If pumping of groundwater is required, pumped water should be treated by filtration or retention, as necessary to meet water quality requirements.

Phased Construction

Construction of depression complexes would be phased to allow for adaptive management to ensure performance of constructed elements. It is likely that only a portion of the depressions would be built in the first year of construction. The initial work would then be observed over the following few seasons to evaluate performance. These areas would then be adaptively managed, as necessary during implementation of later phases. The remaining work would be completed applying knowledge gained through adaptive management of Phase 1 components.

Elements of Adaptive Management

The design drawings include adaptive management tools that can be used to modify depression hydroperiod based on observed performance. The elements are summarized below in Table 1.

Table 1. Adaptive management tools that can be applied to increase or decrease depression hydroperiod.

Decrease Hydroperiod	*Increase Hydroperiod*
• Breach berm in select locations to reduce depression storage volume • Backfill • Construct swale to drain depression towards existing slough channel	• Excavate depressions deeper to increase storage volume and the potential for groundwater influence • Construct swale and berm to direct surface runoff towards depression

4.0 HYDROLOGIC AND HYDRAULIC CALCULATIONS

4.1 Hydraulic & Hydrologic Design Criteria

Site observations and past modeling efforts by FEMA indicate that the project area is backwatered during even moderately high flows, essentially forming a ponded area with very minimal velocity. Since the proposed work will not alter this flow regime, nor is its success dependent on a precise understanding of peak flow hydraulics, our modeling efforts are focused on gaining an understanding of the hydrologic performance (depth, duration, and frequency of inundation) of individual depressions and how this will influence our ability to meet certain of the project's objectives. Specifically, the analysis is focused on the ability of each of these sites to create topographic variability with some ponding in most years, while avoiding the creation of sites with perennial open water.

The hydroperiod at each depression complex will be influenced by regional factors (e.g., rainfall and evaporation), local factors such as depression geometry, runoff patterns, and soil type, and also by their relationship to the slough and local ground water (e.g., depression base elevation and surface water connectivity to the slough). Due to a lack of historic groundwater and surface water level data, combined with variable groundwater elevations within the site (presumed to be linked to localized occurrences of peat), precise estimates of anticipated hydroperiod are not possible at this time. Therefore, a conservative approach was taken to ensure avoidance of perennial open water, using the limited historic data as a starting point and a simple water balance as confirmation. The design concept was also modified to include a suite of adaptive management techniques, each with the potential to adjust hydroperiod following a few seasons of observation, as discussed above

The available local data includes eight years of water level recorder readings at the downstream end of the project (2001-2008) and one year of piezometer data collected on the north side of the slough, adjacent to the project (2009). Though limited in duration, this data provided some insight into the groundwater interaction with the surface waters in the slough channel, as well as typical water surface elevations coincident with cessation of groundwater and surface water inputs to the planned depression complexes (estimated to be June 30th for a wet year).

A water balance was prepared as a check to determine whether a hypothetical depression would completely drain in any given year. The model predicts water surface drawdown in the depressions,

$$D_w = P + R + GW - E - I$$

Where,

D_w, = depth of water in the depression (inches);

P = precipitation (inches);

R = surface runoff (inches);

GW = groundwater (inches);

E = evaporation (inches), and

I = infiltration (inches).

The analysis considers a typical wet year, and assumes that the depression would be full at the time that inputs from precipitation, runoff, and groundwater ended. Based on precipitation records from the gage at Watsonville Waterworks, precipitation amounts were negligible after May 31st in dry and average years and June 30th in wet years. A previous study of shallow groundwater, conducted in the project vicinity by Balance Hydrologics (2010), revealed that groundwater elevations in two piezometers dropped below the 6 foot elevation in late June during a dry year. Since 7 feet is the minimum elevation to which any depression would be excavated in the first phase of work, we assumed that the depressions would no longer receive groundwater, precipitation, or runoff inputs after June 30th.

Evaporation rates were determined from pan evaporation data published in NOAA Technical Report NWS 34 and compared to CIMIS evapotranspiration rates for stations in the project vicinity. Infiltration rates were based on the most conservative end of the published NRCS soil data. We used the monthly rate of evaporation and infiltration to determine whether a depression of 48-inch depth would be completely emptied between July 1st and the beginning of October. Given these assumptions, the maximum depression depth of 48 inches would be dried by August in a typical wet year. This calculation is clearly limited, given that it assumes surface water is free to infiltrate, unimpeded by the presence of groundwater. However, we feel that it demonstrates that we're within the limits of acceptability, especially given our ability to implement adaptive management strategies to further reduce likelihood of perennial ponding.

4.2 Flooding Concerns

A qualitative review of the hydraulic characteristics of the site predicts that flood conveyance would not be adversely impacted by the proposed work. A review of the FEMA Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) revealed that the Watsonville Slough at the project location is backwatered by the Pajaro River under the 100-year flood event. The FEMA encroachment analysis shows that if the 100-year flood plain were to be completely filled to elevation 16.7 feet (NAVD 88), leaving only a designated 100 foot floodway, there would only be an increase of 0.2 feet in Base Flood Elevation. The existing width of the 100-year flood boundary in the project vicinity is approximately 5,000 feet, indicating that significant encroachments could be tolerated with zero measurable impact on conveyance or water surface elevation. The proposed project would only fill a small portion of the cross sectional area available for conveyance, and only by a maximum of 18 inches. Based on comparison of the small amount of fill proposed for this project versus what was used for the encroachment analysis, it is clear that this project would not raise the base flood elevation.

Detailed hydrologic and hydraulic models of the site (HEC HMS & HEC RAS) are currently being prepared by Balance Hydrologics and are anticipated to be calibrated and validated prior to the development of a

final design. The completed models will be consulted prior to finalizing designs, and may provide further insight into hydroperiod, flood flow hydraulics, and base flow conditions.

5.0 REFERENCES

Balance Hydrologics. 2010 Feb 24. Memo – Occurrence of shallow groundwater during Water Year 2009 in boreholes 20 and 21, Middle Watsonville Slough, Santa Cruz County, California.

California Department of Water Resources. 2013. California Irrigation Management Information System (CIMIS): Stations 129 and 209. [Internet]. [cited 2013 April 15]. Available from: www.cimis.water.ca.gov/cimis/welcome.jsp.

[NRCS] U.S. Department of Agriculture, Natural Resources Conservation Service. Web Soil Survey. [Internet]. [cited 2013 April 15]. Available from: http://websoilsurvey.nrcs-usda.gov/.

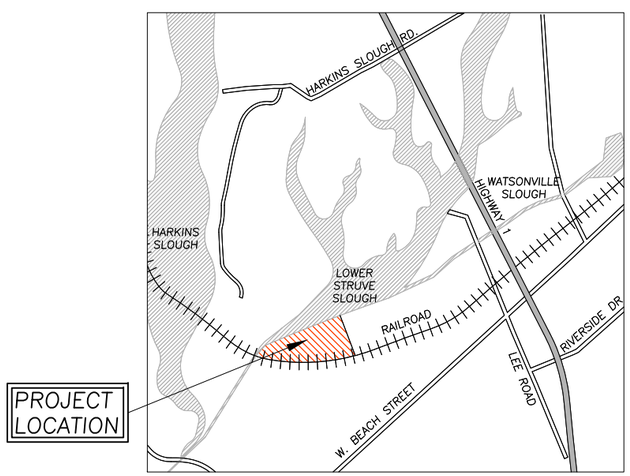
U.S. Department of Commerce. 1982 Dec. National Oceanic and Atmospheric Administration (NOAA) Technical Report NWS 34: Mean Monthly, Seasonal, and Annual Pan Evaporation for the United States. Washington DC. Available from: http://www.nws.noaa.gov/oh/hdsc/Technical_reports/TR34.pdf.

Appendix A

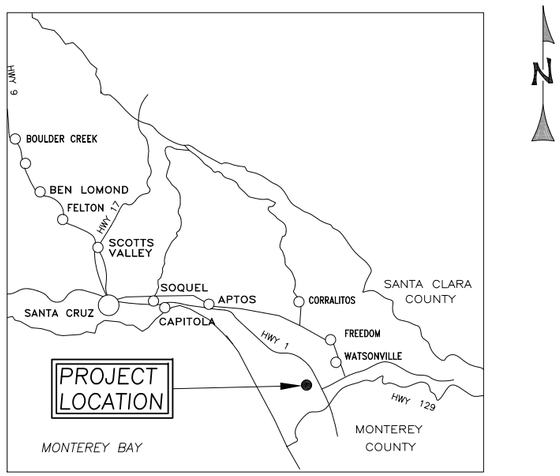
60% Design Drawings

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN

60% DESIGN SUBMITTAL



VICINITY MAP
N.T.S.



REGIONAL MAP
N.T.S.

SHEET INDEX

C1	COVER SHEET
C2	SITE GRADING PLAN
C3	ACCESS AND EROSION CONTROL PLAN
C4	TYPICAL SECTIONS
C5	NOTES
C6	EXISTING CONDITIONS
R1	REVEGETATION PLAN

GENERAL NOTES

1. TOPOGRAPHIC MAPPING IS A COMPILATION OF AMBAG LIDAR DATA AND SUPPLEMENTAL CROSS SECTIONS OF THE WATSONVILLE SLOUGH DITCH THAT WERE CONVENTIONALLY SURVEYED BY BALANCE HYDROLOGICS UNDER SEPARATE CONTRACT FOR THE WATSONVILLE SLOUGH HYDROLOGY STUDY.
2. HORIZONTAL DATUM: CALIFORNIA STATE PLANE COORDINATE SYSTEM, ZONE 3, NAD 83
   VERTICAL DATUM: NAVD 88, BASED ON TIES TO NGS BENCHMARK PID GU4161.
3. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEET.
4. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES SHOWN HEREON ARE SCHEMATIC AND SUBJECT TO CHANGE.
5. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE CURRENT EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").

ABBREVIATIONS

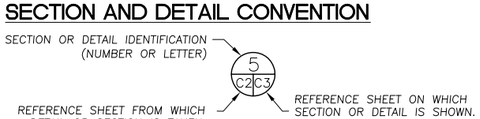
AVG.	AVERAGE
CC	CONCRETE
CY	CUBIC YARDS
DIA.	DIAMETER
E	EXISTING
E.G.	EXISTING GROUND
ELEV.	ELEVATION
DI	DRAINAGE INLET
FG	FINISHED GRADE
FT	FEET
INV	INVERT
N	NEW
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.D.	RELATIVE COMPACTION
RSP	ROCK SLOPE PROTECTION
SPK	SPIKE
SQ.FT.	SQUARE FOOT
T	TREE
T.B.D.	TO BE DETERMINED
TYP	TYPICAL
UNK	UNKNOWN
WSE	WATER SURFACE ELEVATION
YR	YEAR

PROJECT DESCRIPTION

THESE DRAWINGS PROVIDE 60% DESIGN LEVEL DETAILS FOR THE ECOLOGICAL ENHANCEMENTS PROPOSED TO BE IMPLEMENTED OVER APPROXIMATELY 28 ACRES OF PREVIOUSLY FARMED LOW LYING LAND NEAR THE CONFLUENCE OF WATSONVILLE AND STRUVE SLOUGHS, WATSONVILLE, CALIFORNIA.

WORK SHALL CONSIST OF RECONTOURING TO FORM DEPRESSION COMPLEXES AND IMPLEMENTATION OF A NATIVE REVEGETATION PLAN.

SECTION AND DETAIL CONVENTION



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WWW.WATWAYS.COM

PRELIMINARY

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY

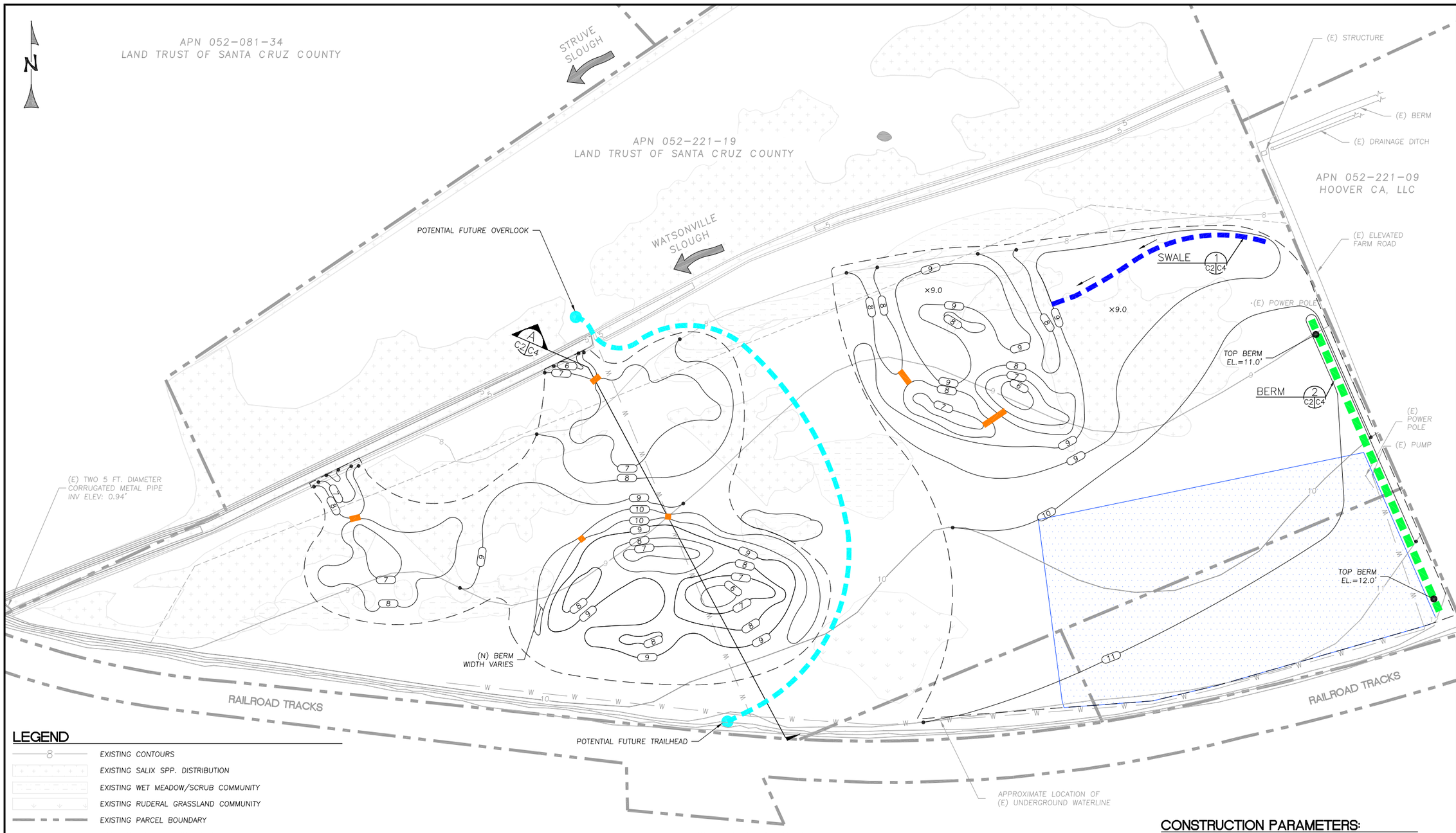
COVER SHEET

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN 60% DESIGN SUBMITTAL

DESIGNED BY:	K.L.N.
DRAWN BY:	B.R.S.
CHECKED BY:	M.W.W.
DATE:	2/17/14
JOB NO.:	12-007

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C1



LEGEND

- EXISTING CONTOURS
- EXISTING SALIX SPP. DISTRIBUTION
- EXISTING WET MEADOW/SCRUB COMMUNITY
- EXISTING RUDERAL GRASSLAND COMMUNITY
- EXISTING PARCEL BOUNDARY
- EXISTING EASEMENT BOUNDARY
- PROPOSED FINISH GRADE CONTOUR
- ×9.0 PROPOSED SPOT GRADE
- PROPOSED BERM
- POTENTIAL FUTURE TRAIL/BOARDWALK ALIGNMENT AND OVERLOOK
- POTENTIAL FUTURE EXCAVATION/BREACHING TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
- POTENTIAL SWALE TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
- AREA RESERVED FOR FUTURE DRAINAGE WATER RECYCLING AREA (4 ACRES ±)
- LIMITS OF GRADING

SITE GRADING PLAN

SCALE: 1"=80'

GRADING SUMMARY

CUT	11,151 CY
FILL	11,151 CY
NET	0 CY

NOTE: THE ABOVE QUANTITIES ARE REPRESENTATIVE OF THE MAXIMUM VOLUME OF GRADING TO OCCUR. GRADING QUANTITIES WILL BE BALANCED ON SITE.

NOTES

1. EXISTING CONDITIONS CONTOURS SHOWN HEREON WERE SIMPLIFIED FROM THE AMBAG LIDAR DATA, FOR ILLUSTRATION PURPOSES ONLY. THE EXISTING GROUND SURFACE AND GRADING VOLUMES ARE BASED ON THE ORIGINAL LIDAR DATA NOT ON THE SIMPLIFIED CONTOURS.
2. VERTICAL DATUM IS NAVD 88.

CONSTRUCTION PARAMETERS:

LOCATIONS AND DETAILS OF DEPRESSION COMPLEXES ARE SCHEMATIC. ACTUAL CONSTRUCTED FEATURES MAY VARY FROM WHAT IS SHOWN TO MINIMIZE DISTURBANCE TO SELECT VEGETATION COMMUNITIES. HOWEVER, ALL WORK SHALL BE CONSTRAINED BY THE FOLLOWING CRITERIA:

1. MAXIMUM CONSTRUCTED SLOPE SHOULD NOT EXCEED 10H:1V, EXCEPT AT LOCALIZED SMALL AREAS AS SHOWN HEREON.
2. MINIMUM ELEVATION OF DEPRESSION COMPLEXES IS 6 FEET.
3. MAXIMUM DEPRESSION DEPTH IS 4 FEET BELOW EXISTING GROUND.
4. FILL DEPTH SHOULD NOT EXCEED 18 INCHES, EXCEPT WHERE SHOWN HEREON.
5. LIMITS OF CLEARING AND GRUBBING SHALL BE STAKED IN COORDINATION WITH THE BIOLOGIST PRIOR TO GRADING, BASED ON PLANT SURVEYS TO BE PERFORMED IMMEDIATELY PRIOR TO WORK.

WATERWAYS CONSULTING INC.
403B SWIFT ST.
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SITE GRADING PLAN

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
60% DESIGN SUBMITTAL

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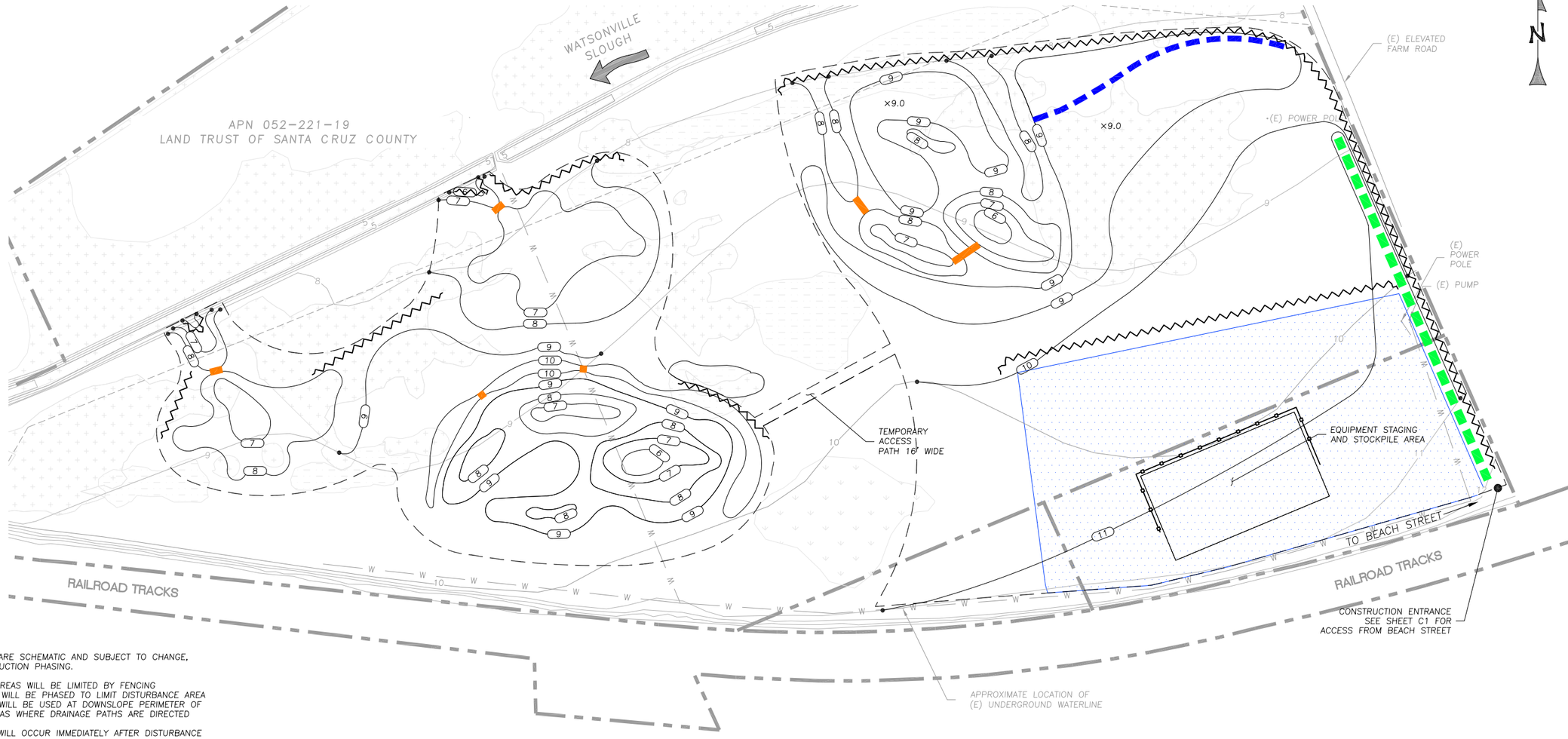
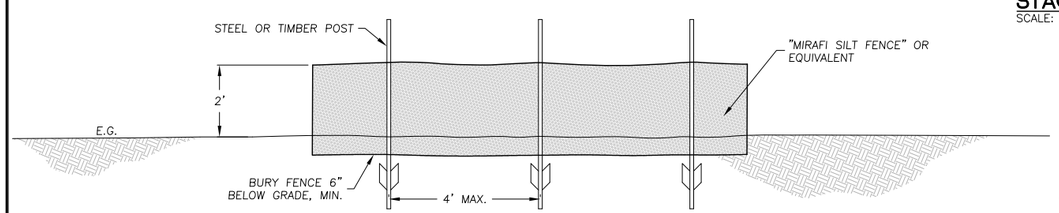
0 1"

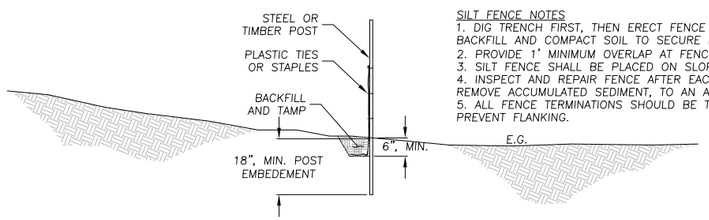
C2



NOTES:
1. FEATURES SHOWN ARE SCHEMATIC AND SUBJECT TO CHANGE, BASED ON CONSTRUCTION PHASING.
2. GENERALLY
   - DISTURBANCE AREAS WILL BE LIMITED BY FENCING
   - CONSTRUCTION WILL BE PHASED TO LIMIT DISTURBANCE AREA
   - SILT CONTROL WILL BE USED AT DOWNSLOPE PERIMETER OF DISTURBED AREAS WHERE DRAINAGE PATHS ARE DIRECTED OFF SITE
   - REVEGETATION WILL OCCUR IMMEDIATELY AFTER DISTURBANCE

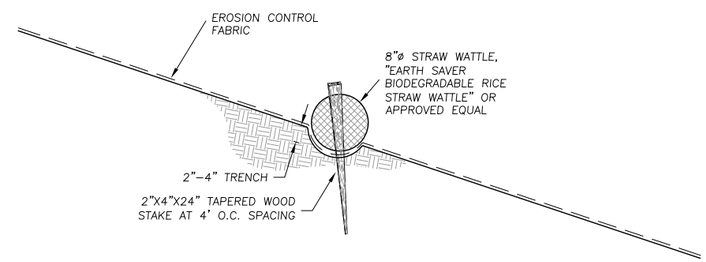
STAGING AND EROSION CONTROL PLAN
SCALE: 1"=80'





SILT FENCE NOTES
1. DIG TRENCH FIRST, THEN ERECT FENCE IN TRENCH. BACKFILL AND COMPACT SOIL TO SECURE FABRIC.
2. PROVIDE 1' MINIMUM OVERLAP AT FENCE SPLICES.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS.
4. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE ACCUMULATED SEDIMENT, TO AN APPROVED AREA.
5. ALL FENCE TERMINATIONS SHOULD BE TURNED UPSLOPE TO PREVENT FLANKING.

SILT FENCE
SCALE: 1"=2'
1 C3 C3



FIBER ROLL
SCALE: 1"=1'
2 C3 C3

LEGEND
- FIBER ROLL
- SILT FENCE
- LIMITS OF GRADING
- 8 EXISTING CONTOURS
- EXISTING SALIX SPP. DISTRIBUTION
- EXISTING WET MEADOW/SCRUB COMMUNITY
- EXISTING RUDERAL GRASSLAND COMMUNITY
- EXISTING PARCEL BOUNDARY
- EXISTING EASEMENT BOUNDARY
- 8 PROPOSED FINISH GRADE CONTOUR
- ×9.0 PROPOSED SPOT GRADE
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- POTENTIAL FUTURE EXCAVATION/BREACHING TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
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ACCESS AND EROSION CONTROL

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
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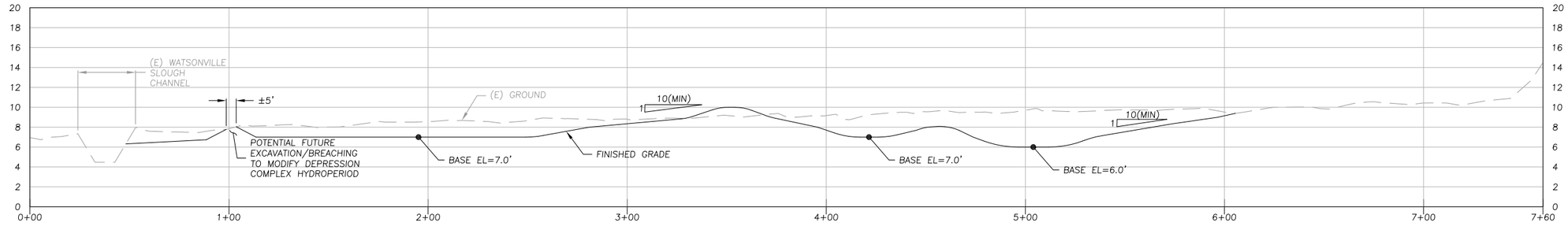
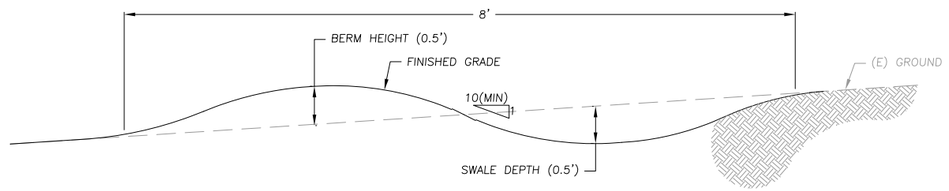
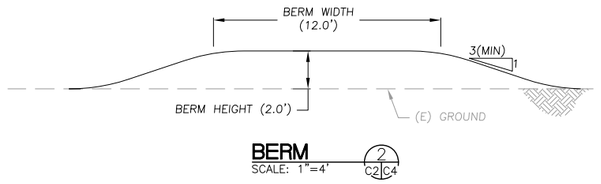


CROSS SECTION (A C2|C4)
SCALE: H:1"=30'; V:1"=5'



SWALE (1 C2|C4)
SCALE: 1"=1'



BERM (2 C2|C4)
SCALE: 1"=4'

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TYPICAL SECTIONS

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
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0 1"

GENERAL NOTES

1. AFFECTED APN: 052-221-19
2. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE MAY 2006 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
3. THE ENGINEER SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL MONITOR THE WORK, AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.
4. EXISTING UNDERGROUND UTILITY LOCATIONS:
   A. PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.
   B. LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.
   C. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.
   D. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, CONTRACTOR SHALL DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.
   E. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS, AND SHALL BE SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION. CONTRACTOR TO CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.
   F. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.
   G. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.
5. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, HE SHALL NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
6. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.
7. ANY TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION, HOWEVER, OBSERVATION AND TESTING SERVICES ARE REQUIRED BY THE GEOTECHNICAL ENGINEER AS OUTLINED IN THIS PLAN SET AND IN THE GEOTECHNICAL REPORT. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.
8. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL PROVIDE ENGINEER A DETAILED CONSTRUCTION SCHEDULE FOR APPROVAL. THE CONTRACTOR SHALL NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL. THE CONTRACTOR SHALL PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.
11. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.
12. THE CONTRACTOR SHALL MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. ALL MATERIALS SHALL BE STORED WITHIN APPROVED STAGING AREAS.
14. THE CONTRACTOR SHALL PROVIDE, AT HIS EXPENSE, ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION AND CERTIFIED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.
17. CONSTRUCTION WATER IS AVAILABLE THROUGH THE ONSITE WELL.

EARTHWORK NOTES

1. ALL CLEARING AND GRUBBING, SUBGRADE PREPARATION AND EARTHWORK SHALL COMPLY WITH THE "BRYANT HABERT PROPERTY VEGETATION MANAGEMENT PLANS", PREPARED BY WATSONVILLE WETLANDS WATCH, AND THE APPLICABLE REQUIREMENTS OF THE SANTA CRUZ COUNTY GRADING ORDINANCE. REFER TO DETAILED SPECIFICATIONS FOR SITE PREPARATIONS CONTAINED IN BRYANT HABERT PROPERTY VEGETATION MANAGEMENT PLANS.
2. GRADING SUMMARY:
   TOTAL CUT VOLUME = 11,754 CY
   TOTAL FILL VOLUME = 11,754 CY
   OFFHAUL = 0 CY

   THE ABOVE QUANTITIES ARE APPROXIMATE IN-PLACE VOLUMES CALCULATED AS THE DIFFERENCE BETWEEN EXISTING GROUND AND THE PROPOSED FINISH GRADE, PREPARED FOR PERMITTING PURPOSES ONLY. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS AND/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED. THE QUANTITIES HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING AND GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION, AND RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS AND CONSTRUCTION METHODS.

   THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT AND PLACEMENT OF EARTH MATERIALS OR THE EXPORT AND PROPER DISPOSAL OF EXCESS OR UNSUITABLE EARTH MATERIALS.
3. ALL EXCESS SOILS SHALL BE REMOVED TO AN APPROVED DUMP SITE OR DISPOSED OF ON SITE AT A LOCATION TO BE APPROVED BY THE OWNER, IN A MANNER THAT WILL NOT CAUSE EROSION,
4. FINE GRADING ELEVATIONS AND SLOPES NOT SHOWN SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO OBTAIN DRAINAGE IN THE DIRECTION INDICATED. ALL FINAL GRADING SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
5. ALL CONTACT SURFACES BETWEEN ORIGINAL GROUND AND RECOMPACTED FILL SHALL BE SCARIFIED TO A DEPTH OF AT LEAST 8 INCHES, UNLESS DEEPER EXCAVATION IS REQUIRED BY THE ENGINEER.
6. THE DISTRIBUTION AND GRADATION OF FILL MATERIALS SHALL BE SUCH THAT THERE ARE NO LENSES, POCKETS, STREAKS, OR LAYERS OF MATERIAL.
7. MOISTURE CONTENT OF THE FILL MATERIAL SHALL BE ADEQUATE FOR OBTAINING THE REQUIRED COMPACTION. MATERIAL THAT IS TOO WET SHALL BE DRIED TO MEET THIS REQUIREMENT, OR REMOVED, AND MATERIAL THAT IS TOO DRY SHALL HAVE WATER ADDED AND MIXED UNTIL THE REQUIREMENT IS MET.
8. THE PROPER MOISTURE CONTENT FOR COMPACTION WILL BE DETERMINED BY INSPECTION DURING THE PLACEMENT OPERATION. THE MATERIAL SHOULD MAINTAIN A BALL SHAPE WHEN SQUEEZED IN THE HAND. WHEN SPECIFIED, THE MOISTURE SHALL BE MAINTAINED WITHIN 2 PERCENTAGE POINTS OF OPTIMUM AS DETERMINED BY ASTM D-698.
9. SUPPLEMENTAL WATER, WHEN REQUIRED, MAY BE APPLIED BY SPRINKLING THE MATERIALS ON THE FILL. UNIFORM DISTRIBUTION OF THE MOISTURE SHALL BE OBTAINED BY DISCING, BLADING OR OTHER APPROVED METHOD PRIOR TO COMPACTION.
10. CONSTRUCTION EQUIPMENT SHALL BE OPERATED OVER EACH LAYER OF FILL TO ENSURE THAT THE REQUIRED COMPACTION IS OBTAINED. SPECIAL EQUIPMENT SHALL BE USED IF NEEDED TO OBTAIN THE REQUIRED COMPACTION.
11. FILL SHALL BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY, IN ACCORDANCE WITH ASTM D-1557. THE TOP 8 INCHES OF FILL SHALL BE COMPACTED TO 85% MAXIMUM DENSITY.
12. COMPACTION SHALL MEET THE REQUIREMENTS OF THE METHOD SPECIFIED FOR A, B, OR C, AS DESCRIBED BELOW:
   A. SHEEPSFOOT ROLLER - THE MAXIMUM LAYER THICKNESS SHALL BE 8 INCHES BEFORE COMPACTION. THE ROLLER SHALL HAVE STAGGERED, UNIFORMLY SPACED TAMPING FEET AND BE EQUIPPED WITH SUITABLE CLEANERS. THE WEIGHT OF THE ROLLER SHALL NOT BE LESS THAN 2,500 POUNDS PER FOOT OF WIDTH. THE MAXIMUM SPEED OF THE COMPACTION EQUIPMENT SHALL BE 3 MILES PER HOUR. THE ENTIRE SURFACE OF EACH LAYER PLACED SHOULD RECEIVE 6 PASSES OF THIS EQUIPMENT TO ATTAIN THE NECESSARY COMPACTION.
   B. PNEUMATICALLY TIRED EQUIPMENT - THE MAXIMUM LAYER THICKNESS BEFORE COMPACTION SHALL BE 6 INCHES. A LOADED SCRAPER MAY BE CONSIDERED A PNEUMATIC ROLLER. THE WHEELS OF THIS EQUIPMENT MUST PASS OVER 90 PERCENT OF THE SURFACE OF EACH LIFT BEFORE A NEW LIFT IS PLACED.
   C. TRACK LAYING EQUIPMENT (BULLDOZER) - THE MAXIMUM LAYER THICKNESS BEFORE COMPACTION SHALL BE 4 INCHES. THE TRACKS OF THE EQUIPMENT MUST PASS OVER 90 PERCENT OF THE SURFACE OF EACH LIFT BEFORE A NEW LIFT IS PLACED.
13. HEAVY COMPACTION EQUIPMENT SHALL NOT BE OPERATED WITHIN 2 FEET OF ANY STRUCTURE. HAND DIRECTED TAMPERS OR COMPACTORS SHALL BE USED ON AREAS NOT ACCESSIBLE TO HEAVY COMPACTION EQUIPMENT, AND WITHIN 2 FEET OF ANY STRUCTURE. FILLS COMPACTED IN THIS MANNER SHALL BE PLACED IN LAYERS NOT GREATER THAN 4 INCHES IN THICKNESS BEFORE COMPACTION, AND SHALL MEET THE SAME DENSITY REQUIREMENT AS FOR THE ADJACENT AREA.
14. COMPLIANCE WITH COMPACTION REQUIREMENTS WILL BE DETERMINED BY THE ENGINEER'S OBSERVATION OF PERFORMANCE FOR METHODS A, B, AND C.
15. FILL NOT MEETING THE SPECIFIED REQUIREMENTS SHALL BE REWORKED OR REMOVED AND REPLACED WITH ACCEPTABLE FILL.

ACCESS AND STAGING AREA NOTES

1. PRIOR TO STARTING WORK ON THE PROJECT, THE CONTRACTOR SHALL SUBMIT FOR ACCEPTANCE BY THE ENGINEER A HAZARDOUS MATERIALS CONTROLS AND SPILL PREVENTION PLAN. THE PLAN SHALL INCLUDE PROVISIONS FOR PREVENTING HAZARDOUS MATERIALS FROM CONTAMINATING SOIL OR ENTERING WATER COURSES, AND SHALL ESTABLISH A SPILL PREVENTION AND COUNTERMEASURE PLAN.
2. UTILIZE ONLY THE APPROVED ACCESS POINTS, AS SHOWN ON THE DRAWINGS. MATERIALS SHALL BE STOCKPILED WITHIN AN EXISTING FLAT AND PREVIOUSLY DISTURBED AREA.
3. ACCESS PLAN IS SCHEMATIC. CONTRACTOR SHALL SUBMIT A SITE ACCESS PLAN FOR APPROVAL BY THE ENGINEER.
4. THE DOWNSLOPE PERIMETER OF STAGING OR STOCKPILE AREAS SHALL BE CONTAINED WITH SILT FENCE.
5. ALL EQUIPMENT AND MATERIALS SHALL BE STORED, MAINTAINED AND REFUELED IN A DESIGNATED PORTION OF THE STAGING AREA.

EROSION CONTROL NOTES

1. THE EROSION CONTROL PLAN SHOWN IS INTENDED FOR THE SUMMER CONSTRUCTION SEASON (APRIL 15TH TO OCTOBER 15TH). IF THE DRAINAGE FEATURES SHOWN ON THESE DRAWINGS ARE NOT COMPLETED AND DISTURBED AREAS STABILIZED BY OCTOBER 1ST, CONSULT THE ENGINEER FOR ADDITIONAL RAINY SEASON EROSION CONTROL MEASURES.
2. THE EROSION CONTROL DEVICES ON THIS PLAN ARE A SCHEMATIC REPRESENTATION OF WHAT MAY BE REQUIRED. EROSION CONTROL DEVICES MAY BE RELOCATED, DELETED, OR ADDITIONAL ITEMS MAY BE REQUIRED DEPENDING ON THE ACTUAL SOIL CONDITIONS ENCOUNTERED, AT THE DISCRETION OF THE ENGINEER.
3. ALL WORK SHALL COMPLY WITH AN APPROVED STORM WATER POLLUTION PREVENTION PLAN, TO BE PREPARED AND IMPLEMENTED BY THE CONTRACTOR, IN COMPLIANCE WITH THE REQUIREMENTS OF THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES, WATER QUALITY ORDER NO. 2009-0009-DWQ, GENERAL PERMIT NO. CAS000002, ADOPTED SEPTEMBER 2, 2009, (HEREAFTER CONSTRUCTION GENERAL PERMIT (CGP).
4. CONTRACTOR SHALL NOT BEGIN SITE DISTURBING ACTIVITIES UNTIL THE SWPPP HAS BEEN APPROVED BY THE OWNER, UPLOADED TO SMARTS, AND A WASTE DISCHARGE IDENTIFICATION (WDID) NUMBER RECEIVED.
5. IMPLEMENTATION OF SWPPP MEASURES SHALL BE THE FIRST ORDER OF BUSINESS UPON SITE MOBILIZATION.
6. PRIOR TO COMMENCING WORK, AREAS TO REMAIN UNDISTURBED SHALL BE PROTECTED WITH ESA FENCING, AS SHOWN ON THE DRAWINGS. ADDITIONAL FENCING MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.
7. DO NOT DISTURB AREAS OUTSIDE OF THE DESIGNATED LIMITS OF DISTURBANCE, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. ALL WORK ASSOCIATED WITH RESTORATION AND REVEGETATION OF DISTURBED AREAS OUTSIDE THE DESIGNATED LIMITS OF DISTURBANCE, AS SHOWN ON THE DRAWINGS, SHALL BE BORN SOLELY BY THE CONTRACTOR.
8. BETWEEN OCTOBER 15 AND APRIL 15, EXPOSED SOIL SHALL BE PROTECTED FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, ANY EXPOSED SOIL ON DISTURBED SLOPES SHALL BE PERMANENTLY PROTECTED FROM EROSION.
9. A STANDBY CREW FOR EMERGENCY WORK SHALL BE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 15 THROUGH APRIL 15). NECESSARY MATERIALS SHALL BE AVAILABLE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES.
10. CONSTRUCT TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THIS PLAN AND/OR AS DIRECTED BY THE ENGINEER TO CONTROL DRAINAGE WHICH HAS BEEN AFFECTED BY GRADING AND/OR TRENCHING OPERATIONS.
11. INSTALL ALL PROTECTIVE DEVICES AT THE END OF EACH WORK DAY WHEN THE FIVE-DAY RAIN PROBABILITY EQUALS OR EXCEEDS 50 PERCENT AS DETERMINED FROM THE NATIONAL WEATHER SERVICE FORECAST OFFICE: WWW.SRH.NOAA.GOV.
12. AFTER A RAINSTORM, ALL SILT AND DEBRIS SHALL BE REMOVED FROM CHECK BERMS AND SEDIMENTATION BASIN AND THE BASIN(S) PUMPED DRY.
13. THE CONTRACTOR IS RESPONSIBLE TO KEEP IN FORCE ALL EROSION CONTROL DEVICES AND TO MODIFY THOSE DEVICES AS SITE PROGRESS DICTATES.
14. THE CONTRACTOR SHALL MONITOR THE EROSION CONTROL DEVICES DURING STORMS AND MODIFY THEM IN ORDER TO PREVENT PROGRESS OF ANY ONGOING EROSION.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS AND SIDEWALKS, AT LEAST ONCE EVERY 24 HOURS WHEN OPERATIONS ARE OCCURRING.
16. CONTRACTOR SHALL BE FAMILIAR WITH THE CONDITIONS OF APPROVAL OF ALL REQUIRED PROJECT PERMITS AND SHALL IMPLEMENT ALL REQUIRED BMP'S PRIOR TO COMMENCING GRADING OPERATIONS.

AIR QUALITY NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL, THROUGHOUT THE CONSTRUCTION, IN ACCORDANCE WITH THE CONDITIONS OF THE DUST CONTROL PERMIT.

1. ALL DISTURBED AREAS, INCLUDING UNPAVED ACCESS ROADS OR STORAGE PILES, NOT BEING ACTIVELY UTILIZED FOR CONSTRUCTION PURPOSES, SHALL BE EFFECTIVELY STABILIZED OF DUST EMISSIONS USING WATER, CHEMICAL STABILIZER/SUPPRESSANT, OR VEGETATIVE GROUND COVER.
2. ALL GROUND-DISTURBING ACTIVITIES (E.G., CLEARING, GRUBBING, SCRAPING, AND EXCAVATION) SHALL BE EFFECTIVELY CONTROLLED OF FUGITIVE DUST EMISSIONS UTILIZING APPLICATION OF WATER OR BY PRE-SOAKING.
3. ALL MATERIALS TRANSPORTED OFFSITE SHALL BE COVERED OR EFFECTIVELY WETTED TO LIMIT DUST EMISSIONS.
4. FOLLOWING THE ADDITION OF MATERIALS TO, OR THE REMOVAL OF MATERIALS FROM, THE SURFACES OF OUTDOOR STORAGE PILES, SAID PILES SHALL BE EFFECTIVELY STABILIZED OF FUGITIVE DUST EMISSIONS UTILIZING SUFFICIENT WATER OR CHEMICAL STABILIZER/SUPPRESANT.
5. ONSITE VEHICLE SPEED ON UNPAVED SURFACES SHALL BE LIMITED TO 15 MPH.
6. DISTURBED AREAS SHALL BE REVEGETATED AS QUICKLY AS POSSIBLE.
7. ONSITE TRUCK AND EQUIPMENT ENGINES SHALL BE MAINTAINED IN GOOD RUNNING CONDITION, IN ACCORDANCE WITH MANUFACTURERS' SPECIFICATIONS.

WATERWAYS CONSULTING INC.
403B SWIFT ST.
SANTA CRUZ, CA 95060
PH:(831)421-9291 // FAX:(888)819-6847
WWW.WATWAYS.COM

PRELIMINARY
NOT FOR CONSTRUCTION

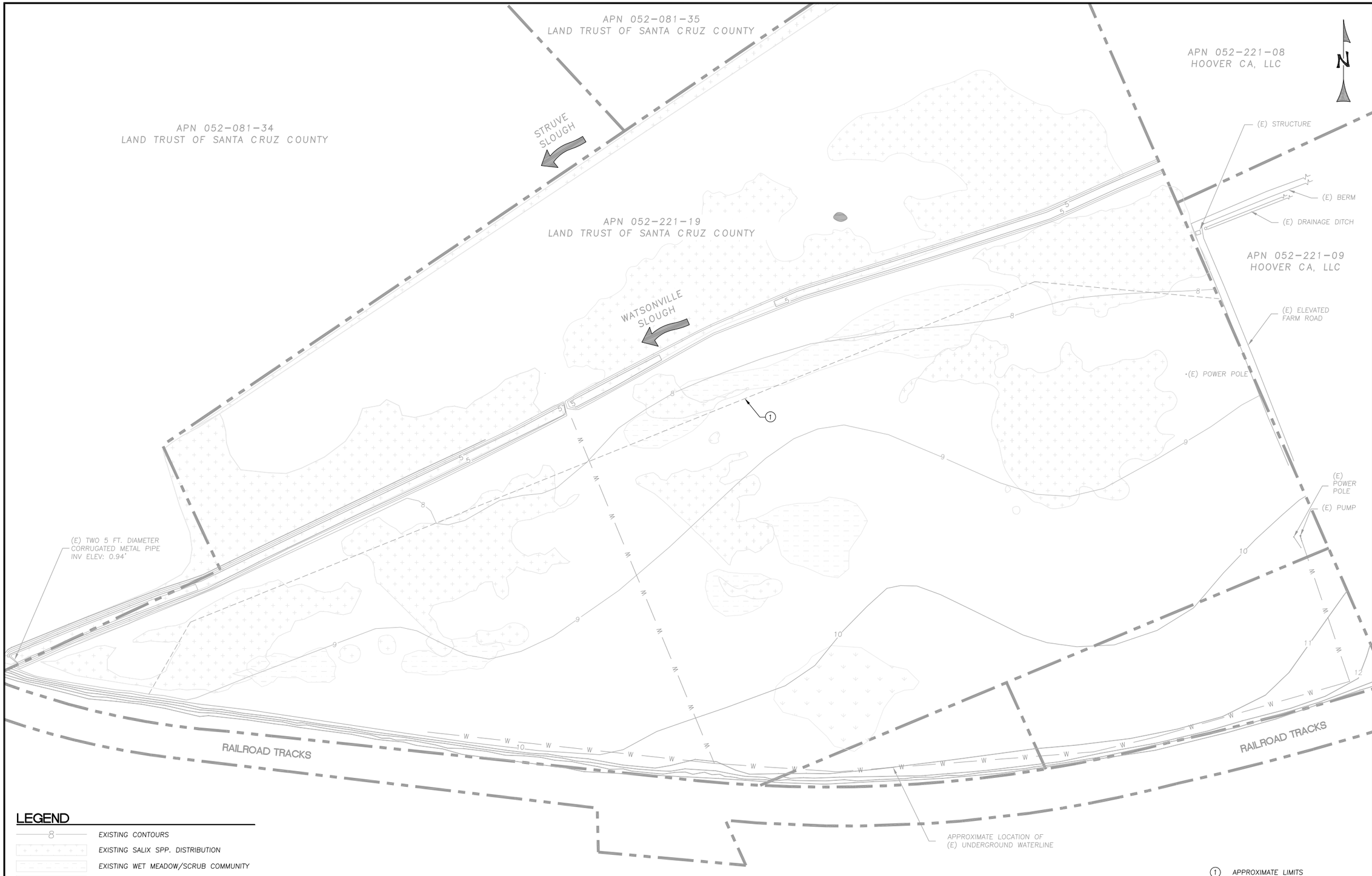
PREPARED AT THE REQUEST OF:
RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY

NOTES

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
60% DESIGN SUBMITTAL

DESIGNED BY:	K.L.N.
DRAWN BY:	B.R.S.
CHECKED BY:	M.W.W.
DATE:	2/17/14
JOB NO.:	12-007

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"



LEGEND

- EXISTING CONTOURS
- EXISTING SALIX SPP. DISTRIBUTION
- EXISTING WET MEADOW/SCRUB COMMUNITY
- EXISTING RUDERAL GRASSLAND COMMUNITY
- EXISTING PARCEL BOUNDARY
- EXISTING EASEMENT BOUNDARY

EXISTING CONDITIONS SITE PLAN

SCALE: 1"=80'

(1) APPROXIMATE LIMITS OF EMERGENCY WATERSHEDS PROTECTION PROGRAM FLOODPLAIN EASEMENT PER DOC# 2010-0003063

WATERWAYS CONSULTING INC.
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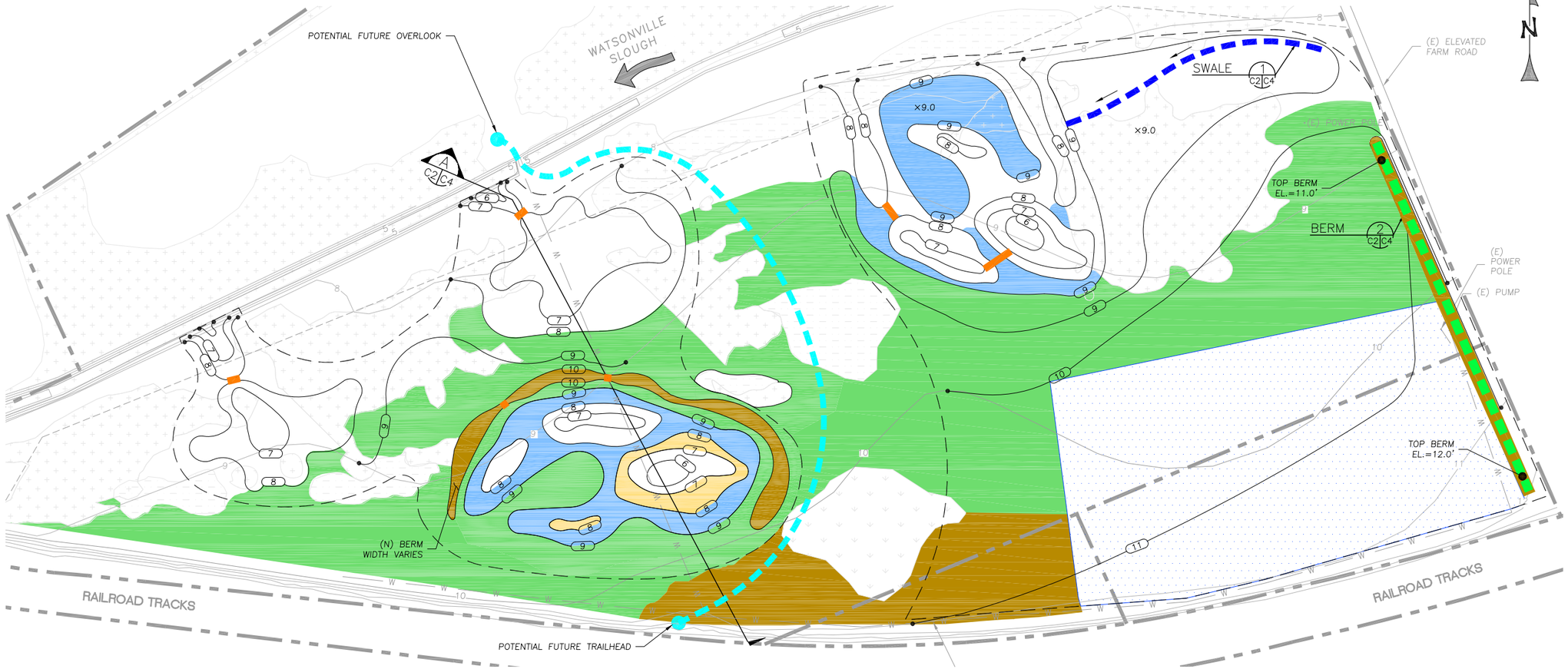

REVEGETATION PLAN
SCALE: 1"=80'

NOTE:
GRADING ACTIVITIES WILL BE FIELD FIT TO AVOID HIGH VALUE EXISTING HABITAT AT TIME OF CONSTRUCTION

PROPOSED PLANT COMMUNITIES

COMMUNITY		AREA	ELEVATION
	PROPOSED SEASONAL WETLAND ENHANCEMENT I	0.2 ACRES	7–8 FT.
	PROPOSED SEASONAL WETLAND ENHANCEMENT II	1.4 ACRES	8–9 FT.
	WET MEADOW ENHANCEMENT	8.0 ACRES	8–11 FT.
	NATIVE GRASSLAND ENHANCEMENT	1.8 ACRES	10–12 FT.

EXISTING PLANT COMMUNITIES

COMMUNITY	
	EXISTING SALIX SPP. DISTRIBUTION
	EXISTING WET MEADOW/SCRUB
	EXISTING RUDERAL GRASSLAND

LEGEND

- EXISTING CONTOURS
- EXISTING PARCEL BOUNDARY
- EXISTING EASEMENT BOUNDARY
- PROPOSED FINISH GRADE CONTOUR
- ×9.0 PROPOSED SPOT GRADE
- PROPOSED BERM
- POTENTIAL FUTURE TRAIL/BOARDWALK ALIGNMENT AND OVERLOOK
- POTENTIAL FUTURE EXCAVATION/BREACHING TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
- POTENTIAL SWALE TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
- AREA RESERVED FOR FUTURE DRAINAGE WATER RECYCLING AREA (4 ACRES ±)
- LIMITS OF GRADING

WATSONVILLE WETLANDS WATCH
500 HARKINS SLOUGH ROAD
WATSONVILLE, CA 95076

PRELIMINARY

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY

REVEGETATION PLAN

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
60% DESIGN SUBMITTAL

DESIGNED BY:	K.L.N.
DRAWN BY:	B.R.S.
CHECKED BY:	M.W.W.
DATE:	2/17/14
JOB NO.:	12-007

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

R1

Appendix B

Revegetation Plan Report

Bryant Habert Property Vegetation Management Plans

DRAFT

Prepared for:

Resource Conservation District of Santa Cruz County
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Capitola, California 95010
Contact: Kelli Camara

The Land Trust of Santa Cruz County
617 Water Street
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Watsonville, California, 95076
Contact: Jonathan Pilch

February 2014

Introduction and Existing Conditions

The Bryant Habert property is located within the Watsonville Slough corridor between San Andreas Road and Highway 1. It includes 46.3 acres of historic agricultural fields that are in the process of reverting back to a mix of permanent and seasonal marsh and upland habitats. The property includes sections of Watsonville Slough and Struve Slough. Portions of the Bryant Habert property were in agricultural production or maintained for future production with annual discing until 2010, at which point the entire property was fallowed and has been managed with annual discing, mowing, habitat preservation, and invasive plant management. Several landscape features from the historical farming practices remain on the property, including the Watsonville Slough maintenance channel, the Struve Slough maintenance channel, an underground irrigation network and an agricultural production well. In 2010, a permanent floodplain easement was established on the northern part of the property and select areas within the easement south of the Watsonville Slough channel were planted with native vegetation at that time.

An inventory of the plant communities on the property, associated with this vegetation management plan, was made in the fall of 2012 and is detailed in the vegetation inventory of the property and map (see Appendix A). Existing vegetation communities on the Bryant Habert property include low seasonal marsh, high seasonal marsh, ruderal wet meadow, willow scrub, and ruderal grassland habitat. The following vegetation management plan is a companion to the grading plan which is intended to enhance habitat on the property. By-in-large, grading activities are planned in a manner to retain stands of existing native plants and habitat areas or preferred non-native, non-invasive plants.

Implementation of this vegetation plan will consist of three phases:

- site preparation, including management measures to prepare the area prior to grading and planting,
- establishment, including planting activities such as seeding and transplanting and associated management measures such as irrigation, and
- monitoring, maintenance and adaptive management, including management measures such as mowing and herbicide applications.

The over-arching goal for management of the property is to restore a mosaic of functional and self-maintaining wetlands and uplands.

General goals of the project are as follows:

1. Enhance regional biodiversity and under-represented habitat units within the slough system.
2. Enhance system resilience to climatic and hydrologic change, through targeting processes and broad habitat types rather than the narrow needs of specific species.
3. Avoid the creation of additional perennial open water habitat.
4. Provide upland refugia in close proximity to wetland habitats.
5. Provide these enhancements in a self-sustaining (low maintenance) fashion.
6. Increase the viability of agriculture in the broader area.

7. Provide an aesthetic demonstration of ecologic restoration along the future Monterey Bay Sanctuary Trail.

The following is a list of objectives for vegetation management on the property.

1. Preserve existing high quality habitats and areas with desirable plant communities, including low seasonal marsh, high seasonal marsh, significant stands of willow scrub, and stands of desirable wet meadow and ruderal grassland habitat.
2. Utilize grading activities which favor low seasonal marsh, high seasonal marsh, wet meadow and mudflat to improve favorable habitat conditions and reduce the persistence of ruderal habitats dominated by invasive plants.
3. Enhance existing ruderal wet meadow and grassland habitat areas through vegetation management strategies, such as discing, and re-vegetation during the site preparation and establishment phases of the project.
4. Plan for minimal ongoing management, such as mowing and discing, during the maintenance and adaptive management phase, to both contain future maintenance costs and support wildlife and ground-nesting birds.
5. Reduce the abundance of undesirable plants, such Bristly ox tongue (*Helmenothica echoides).*
6. Establish plant communities compatible with surrounding farm operations.

The vegetation management plan contains the following sections:

I. Preservation of Existing Desirable Habitat
II. Management Measures and Constraints
III. Site Preparation Prior to Grading
IV. Vegetation Establishment
V. Maintenance, Monitoring, and Adaptive Management

The following appendices are located at the end of this document:

Appendix A. Site Maps
Appendix B. Specifications for Establishing Plant Material by Seed, Budgets
Appendix C. Specifications for Establishing Plant Material with Intensive Trasplants, Budgets
Appendix D. Vegetation Establishment Recommendation Memo: 6/2013
Appendix E. Establishing Native Plants from Transplant Memo

I. Preservation of Existing Desirable Habitat

Vegetation and plant communities were surveyed and mapped in 2012 as a part of the baseline inventory for the project. Existing mudflat, seasonal wetland, low seasonal marsh, high seasonal marsh, and willow scrub habitat areas are planned to be largely preserved during grading due to the presence of locally rare and valuable habitat and native plant species (see Figures 1 and 2, Appendix A).

Mudflats

Limited mudflats are found on the property. Mudflats represent an important habitat type within the slough system, providing habitat for permanent and migratory shorebirds in fall months. Areas that support mudflats will be preserved. Grading activities are designed to increase mudflat habitat.

Low Seasonal Marsh and High Seasonal Marsh Habitat

During the existing vegetation inventory in 2012, low seasonal marsh and high seasonal marsh habitats were identified (see Figure 1, Appendix A.). These areas support predominately native plant species, constitute relatively rare and under-represented habitat types within the Watsonville Sloughs watershed and provide desirable habitat conditions for a wide range of wildlife species. In 2010 and 2011, the high seasonal marsh habitat areas supported the locally rare native plant species, bracted popcorn flower (*Plagiobothrys bracteatus*), as well as other uncommon native plant species such as golden dock (*Rumex maritima*), and water speedwell (*Veronica anagallis-aquatica*).

Areas identified as low and high seasonal marsh habitat will be undisturbed during grading activities and require no re-vegetation activity, with the exception of those areas designed to provide a surface water connection between the Watsonville Slough channel and the planned seasonal wetland depressions (See Figure 2, Appendix A and grading plan).

Willow Scrub

Willow scrub habitat is found throughout the property below the 10’ elevation contour and is considered a desirable vegetation community due to its habitat value for a diversity of bird and mammal species, including songbird and raptor populations which use the property (see Figures 1 and 2, Appendix A). While relatively common in the sloughs, willow scrub habitat is decreasing in many parts of the slough system due to the decade long trend of consistently high levels of surface water in areas that historically dried annually. Emerging willow scrub habitat therefore has value in the context of watershed-wide habitat availability and associated value to wildlife.

Most areas mapped as willow scrub will be preserved. Some areas with willows less than 6-inch dbh (diameter at breast height) will be converted into other habitats through grading and re-vegetation.

Ruderal Wet Meadow and Grassland Habitat

The ruderal wet meadow and grassland habitat areas on the property contain extensive growth of non-native, invasive plant species, including bristly ox-tongue (*Helmenothica echoides*) and various other invasive thistle species. However, throughout these two habitat types, there are concentrations of native plants or non-native, *non-invasive* plants. These areas have been identified as existing desirable habitat within the ruderal grassland and wet meadow habitat (see Figure 2, Appendix A.). Native plants include marsh goldenrod *(Euthamia occidentalis*), coyote brush (*Baccharis pilularis*) and horsetail fern *(Equisetum arvensis*). Non-native plants that are considered non-invasive and naturalized within the sloughs watershed and throughout the State, include annual grasses and forbs such as Italian rye (*Festuca perrene*), annual oats (*Avena fatua*), and cut-leaf geranium (*Geranium disectum*).

Areas where wet meadow and grassland habitat is dominated by non-native invasive species will be managed to support more desirable vegetation. Areas where these habitats are dominated by non-native but non-invasive species will generally be preserved, as they are not considered a management priority. Some areas will be converted into other habitats through grading and re-vegetation. Maps to differentiate between desirable and undesirable plant communities in these habitat areas will be updated prior to implementation as described below.

Protection of Desirable Vegetation Areas

Desirable vegetation was mapped during the 2012 survey (see Figure 2, Appendix A). Prior to site preparation or grading activities, a thorough survey will be conducted by a qualified botanist or restoration ecologist to update this map and refine the areas subject to grading and/or vegetation management. This survey will update the 2012 survey as necessary to identify areas of desirable vegetation within the ruderal grassland and wet meadow habitat areas as well as the extent of low seasonal marsh, high seasonal marsh, mudflats, and seasonal wetlands, which are all considered to be desirable vegetation.

As a result of the 2012 and subsequent surveys, desirable plant communities will be avoided during site-preparation and grading work to the extent feasible. Site preparation activities may occur over several years for weed control. In that case, identification and marking of the extent of desirable vegetation will be conducted each year prior to site preparation activities and these areas will be left intact. Areas of desirable vegetation may expand to occupy areas of undesirable vegetation after they are subject to management measures. See Enhancement of Existing Stands of Desirable Vegetation below.

II. Vegetation Management Measures and Constraints

Several vegetation management measures, such as mowing and discing will be utilized at varying times during the site preparation, establishment, maintenance and adaptive management phases of this project.

The following table summarizes the methods and constraints of these practices to be described further in this plan:

Table 1. Management and Measures to Minimize Impacts.

	Management Measure							
Constraints (measures to minimize impacts)	Discing, tilling, and other cultivation	Mowing	Tractor mounted herbicide application	Manual herbicide application: spot spraying	Tractor-mounted flame torch weeding	Manual flame torch weeding	String trimming, weed-whacking, brush-cutting	Hand-pulling, grubbing
maximum occurances in an area	4/year	4/year	2/year	2/year	4/year	not limit	4/year	no limit
qualified biologist monitors area beforehand for CRLF between October 15 and August 15 and for bird nests between March 15 and August 15	yes	yes	yes	no	yes	yes	yes	no
avoidance buffer around inundated areas and saturated soils	50 feet	50 feet	50 feet	25 feet	50 feet	25 feet	25 feet	none
avoidance buffer around bird nests	50 feet	50 feet	50 feet	25 feet	50 feet	25 feet	25 feet	25 feet
other measures (see notes below)	1	2	3	3				

Notes		
	1	no cultivation for two weeks following a rainfall event of 0.75 inches or greater
	2	minimum mower height of 4"
	3	applied per label by a licensed applicator, with a marker dye as appropriate to avoid over-application

III. Site Preparation:

Site Preparation for Invasive Weed Control Prior to Grading and Re-vegetation

Site preparation activities may be implemented each year prior to grading and re-vegetation activities. Successive site preparation activities, such as discing, mowing, herbicide application, flame torch weeding, weed whacking and hand pulling will support recruitment of native plant species on site while decreasing the seed bank of invasive plants that has built up since the field was taken out of agricultural production. This activity is expected to reduce the need for ground disturbance and weed control efforts such as mowing and herbicide after re-vegetation is undertaken. If it is not feasible to prepare the site in the years prior to grading activity, site preparation will be performed in the same year that grading activity will occur so as to provide maximum control of invasive weed species above ground and in the seed bank.

Areas of existing desirable vegetation will be managed with mowing, herbicide application, weed whacking and hand pulling to control undesirable plant species within the over-all "patch" of desirable habitat to encourage expansion of desirable species and control undesirable species. See Table 1, above, for additional details.

Areas outside of those designated as habitat to be preserved (See Preservation of Existing Desirable Habitat, above), may be subject to site preparation measures to reduce the spread and seed-set by invasive and undesirable plant species, such as bristly ox-lounge (*Helmenothica echoides*), bull thistle (*Circium vulgare*), and Italian thistle (*Carduus pycnochephala*). Target species are listed by priority in our Table 2. Invasive Plant Priorities, below, under invasive species management.

Site preparation activities will follow the minimization and avoidance measures provided in the biological opinion for this project and as shown in Table 1, Management Measures and Minimization of Impacts.

A typical set of successive discing would be conducted as follows, though modifications may be made to achieve the desired goal. During discing activity, the first pass will be with a heavy disc implement, to an approximate 6" – 8" depth, due to the high clay content in the soil. Successive management measures will be performed repeatedly to flush weed seed and limit the weed seed in the soil seed bank. The goal is to flush and exhaust to the extent possible, the weed seed bank. Due to soil moisture conditions on site, it is expected that seedlings will continue to germinate in the spring after discing activity due to soil moisture, requiring additional management measures for weed control. Irrigation may be used as needed. Discing may occur up to 4 times per year, depending on soil and site conditions, including biological constraints as outlined in Table 1.

Mowing would be a less effective, but beneficial practice to reduce the establishment and seed production of invasive plant species on site. Due to its limited impact on invasive weed seed in the seed bank, it would likely only be used if discing is not an option due to soil moisture, nesting, or other biological activity. Mowing practices will follow minimization and avoidance measures provided in Table 1. Mowing will only occur outside of the areas of desirable vegetation (Figure 2, Appendix A) so as to exclude mowing in high seasonal marsh, low seasonal marsh, and willow scrub habitat. Mowing may be conducted up to 4 times per year and would typically be required more frequently than discing due to quicker re-growth after mowing, as compared to discing.

Herbicides may be used to reduce the extent of invasive non-native plants in a manner similar to discing or mowing as described above. Broadleaf and broad spectrum post emergent herbicides, including glyphosate, may be used for this purpose. All herbicide use will be conducted by a licensed applicator in strict accordance with the label. See Table 1 for additional details.

Biological Monitoring Prior to Site Preparation

Prior to many of the site preparation activities a survey by a qualified biologist will be conducted, as described in Table 1. The biologist will survey the area for California red-legged frog between October 15 and March 15 or as determined in the Biological Opinion and for nesting birds between March 15 and August 15. Surveys will be conducted within 48 hours of the start of the site preparation activity. Locations of nests will be flagged and avoided, and provided a buffer as shown in Table 1, or treated in another manner as specified in the

minimization and avoidance measures in the biological opinion. Discovery of California red-legged frogs will be addressed as determined in the Biological Opinion.

IV. Vegetation Establishment

Vegetation establishment is intended to provide the conditions for high quality habitat development that is largely self-maintaining and self-propagating, limits the spread and persistence of invasive weeds, and requires limited annual intervention. This will be achieved through:

- preservation and enhancement of existing desirable plant communities, that will provide seed stock to the surrounding areas
- grading activities that promote desirable plant communities through altering site hydrology and the resulting recruitment of desirable plant species, and
- Establishment of robust stands of desirable plant communities through seeding and direct transplant of native plant material.

The majority of the vegetation establishment activities are planned within the existing ruderal grassland and wet meadow habitat and outside areas in which desirable vegetation communities currently exist.

In areas where regular and prolonged surface flooding is anticipated as a result of grading activities, either low intensity re-vegetation no re-vegetation is planned, due to the expected establishment of desirable plant communities from water borne seed and/or high soil saturation condition.

During the establishment phase, the proportion of the re-vegetation to be conducted by direct transplant and seeding will be determined based on financial considerations. Direct transplant at high densities is anticipated to result in greater establishment success than seeding, while seeding has historically been less costly. The actual proportions will be determined based on available resources and market prices at the time of implementation. For the purpose of budgeting, separate budgets have been prepared for seeding and transplanting.

The performance criteria for re-vegetation, described below in the Section Maintenance, Monitoring and Adaptive Management, can be met using either the direct transplant or seeding techniques incorporated into this plan. Due to the high invasive weed presence, seeding and direct transplant are both planned to be done at a high rate so as to compete with the weed seed bank. Generally, direct transplanting is likely to exceed the performance criteria to a greater extent and provide additional benefits such as greater abundance and diversity of native plant species in the resulting grassland, and so it will be preferred if it can be implemented in a cost effective manner.

Trialing of efficient agricultural equipment for transplanting is planned on the Watsonville Slough Farms property to establish large blocks of native wet meadow or grassland habitat by direct transplant as opposed to seed. If this practice is found to be successful in establishing high percent cover of native plant species, this practice would be suitable in place of seeding.

Seeding will be conducted with seed mixes that contain at minimum 90% grass species in order to increase the effectiveness of the broadleaf herbicide application (see Maintenance and Adaptive Management section below). Limited forb species (selected for their hardiness) have been included in the seed mixes (described in Appendix B), as limited quantities of native forbs will persist through broadleaf herbicide treatments. Aggressive native forb species were selected as they can compete for similar areas as undesirable broadleaf weeds, limiting the spread and establishment of invasive weeds.

The planting palates will be differentiated along surface elevations due to the strong influence of seasonal surface water and depth to groundwater on the plant community. Establishment activities with different plant palates include: limited seasonal wetland enhancement, wet meadow enhancement, and native grassland enhancement.

As described in the grading plan, grading may be conducted in multiple entries over a five year period. Vegetation establishment will generally follow grading activity and may be conducted up to 2 years after grading to allow for sufficient site preparation, though most grading and re-vegetation will occur in the same year as to minimize disturbance to wildlife utilizing seasonal wetland habitat in the graded portion of the site. Monitoring and maintenance of the vegetation will occur for at least two years following planting, and potentially for longer as described below in the Section Maintenance, Monitoring and Adaptive Management.

Establishment may also be conducted on areas that are not graded to shift the plant community to a more desirable condition.

Enhancement of Existing Stands of Desirable Vegetation

As described in Section I, Preservation of Existing Desirable Habitat, desirable vegetation will be flagged and avoided during site preparation work. No re-vegetation is planned for these areas, however, these areas will be managed to remove priority invasive plant species (see Table 2 below) to facilitate the further development of the desirable plant community and native habitat.

Marking the Site after Grading

Land surface elevations will be determined following grading activities to ensure selection of the appropriate planting palate and guide planting.

As described in the grading plan and above in this plan, grading activities will be field fit to avoid high value existing habitat and site conditions at the time of construction. The extent of the final grade at different elevations and inundation regimes may vary as a result. Acreages listed below are likely to vary somewhat as a result.

Seedbed Cultivation

Prior to planting seeds or transplants, the site will typically be disced to reduce compaction and provide a proper seed bed for germination. Additional soil preparation activity is expected to include shallow ripping, chiseling, and ring rolling to provide proper soil structure and surface consolidation. Additional cultivation may be utilized prior to seeding or transplanting with other implements such as flex-tine cultivators and finger-tine cultivators. In areas where transplanting of container stock will occur, site preparation of greater intensity during the final cultivation prior to planting will likely be required to facilitate use of mechanical transplant equipment depending on site conditions.

Due to the high water table and difficulty of accessing the site once rains begin, site preparation will occur outside the rainy season to the extent practical.

Seasonal Marsh Enhancement

Seasonal marsh enhancement will be conducted in approximately 0.2 acres between 7 and 8 feet elevation (NAVD88) and 1.4 acres between 8 and 9 feet in elevation in areas which have been graded to lower the surface elevation as described in the grading plan. Most of the areas graded to between 7 and 8 feet in elevation are likely to receive surface floodwaters from the main slough channel, and it is expected that water borne native plant seed will establish in those areas without planting, as has been seen in other similar areas on the property in the time since the agricultural field has been out of production. Those areas that surface waters are unlikely to reach will be re-vegetated with native plant material. A plant material list is found in Appendices B and C.

Wet Meadow Enhancement

Wet meadow enhancement is planned for 8 acres within the 8 to 11 foot elevation range and is intended to provide high quality native wet meadow habitat within the existing ruderal wet meadows on site. Many of these areas will be subject to grading. Wet meadow enhancement work will include seeding and/or transplanting with site appropriate native plant material throughout the enhancement area. Detailed information on species quantities for container stock and seeding and seeding rates are found in Appendices B and C. Seed which requires cold stratification for improved germination will be stratified prior to installation. Quickly colonizing plant species were selected for the majority of the wet meadow enhancement area.

Native Grassland Enhancement

Native grassland restoration is planned for 1.3 acres within the 10 to 12 foot elevation range and is located primarily within areas which are currently ruderal grassland habitat, and which will be disturbed by grading activities. Native grassland enhancement work will include seeding and/or transplanting with site appropriate native seed stock throughout the enhancement area. Detailed

information on species quantities are found in Appendices B and C. Seed which requires cold stratification for improved germination will be stratified prior to installation.

Seed and Container Stock Installation

In areas receiving container stock, native seed will be broadcast seeded or drill seeded into well-tilled soil. After seeding, if the seed is broadcast, the site will be ring rolled and lightly compacted again as to provide good seed to soil contact.

Container stock may be established with either rain or irrigation. If established with rain, container stock will be planted directly into the tilled soil after the first rains but before significant rains make the site inaccessible. As the site is relatively flat and there is limited erosion potential, container stock installation will be conducted after rains or irrigation have established moisture to the depth of the root zone. If feasible, container stock will be planted once grading activity has ended, directly into the tilled soil and irrigated. In the case of container stock installation, the site may be seeded with native seed concurrent with transplanting in order to support greater establishment of desired species.

Container stock will be transplanted either by hand or with mechanized transplanting equipment. For use with agricultural transplant equipment, maximum container size is anticipated to be 2" x 2" x 2 ½".

Irrigation

An irrigation contingency plan will be in place for establishment plantings. In areas where seeding has been utilized, it is expected that with a normal rainfall year, rain will provide sufficient soil moisture for successful establishment of plant material. Irrigation is anticipated to be required for areas in which transplanting will be utilized due to the sensitivity of young transplants or under drought conditions. If large scale irrigation is needed, the irrigation infrastructure on the property will be upgraded to accommodate the pressure needs or a suitable alternative will be identified.

An irrigation contingency plan will be in place for maintaining any container plantings. Sufficient rain prior to planting would be indicated by soil moisture at the depth of the root ball of the plant to be planted. Sufficient rain after planting would be indicated by sufficient soil moisture at the root zone so as not to stress the installed plant. Irrigation of container stock may be conducted with sprinklers and/or drip irrigation by pumping groundwater from the well on site or that of a neighboring farm. A water truck may be used.

Plant Material for Seed and Container Installation

All plant material will be collected from parent material within the Pajaro River watershed or Monterey Bay bioregion to the maximum extent possible, as locally-sourced plant material will be most adapted to on-site conditions in the short-term and provide the conditions for long-term resiliency.

While most seed is planned to be sown at pure live seed rates, some seed collected from wild populations is planned to be sowed at bulk rates, as determining pure live seed rates would be impractical. These specifications are provided in the seeding lists found in Appendixes B and C. The large majority of species that have been selected for seeding and container stock were selected for their phenological abilities to self-propagate and spread aggressively by either seed or rhizome, in order to compete with the high presence of undesirable species on site.

Due to the complexity of production and collection of this material, the relative quantities of seeded and planted species may be adjusted at the time of project implementation.

V. Maintenance, Monitoring and Adaptive Management

Maintenance of areas that have been seeded or planted with container stock

Maintenance activities after seeding or planting are required to ensure the successful establishment of plant material. The maintenance period for this project is anticipated to be two years after installation. It will be extended if the performance measures are not met. During the first year of seeding, the primary goal is to establish native grass and mono-cotyledon species. Use of a broadleaf specific herbicide is planned to remove invasive forb species and establish native grass cover, if necessary. Small quantities of forb species have been included in the seeding mix; however, these may or may not persist due to maintenance practices which target broadleaf weeds. Maintenance practices may include mowing, herbicide application, flame torch weeding, string trimming/weed whacking and hand-weeding.

Maintenance methods will follow practice descriptions as described in the Management Measures and Constraints Table, in Section II Management Measures and Constraints. All practices will occur outside of areas with surface water inundation and outside of areas with saturated soils in order to avoid impacts to sensitive wildlife. A 50 foot buffer will be provided to all areas with surface water inundation with most management measures (see Table 1 for more details).

Flame-torch Weeding: Flame torch weeding can eliminate dicot species (forbs) while preserving monocot species (grasses) due to the relative position and growth of meristem tissue. Depending on the weather and access to the site, a tractor mounted flame torch weeder or hand torch may be used after early rains for control of broadleaf weeds, such as bristly ox-tongue (*Helmenothica echoides*) and bull thistle (*Circium vulgare*).

Herbicide Application: Use of a broadleaf herbicide in conjunction with native grass seeding has been shown to effectively establish high percent cover of native grass species and effectively control undesirable broadleaf weeds. Herbicides may be used for up to two years following planting, with exceptions determined by the adaptive management process described below in this section.

All herbicides would be applied in strict accordance with the label. Herbicides used at the site would typically include selective post-emergent herbicides that control broadleaf weeds at a variety of plant growth stages and are approved for use near or over water bodies (though herbicide applications would not occur over water at any time during the project). Broadleaf herbicides are used to control woody and herbaceous broadleaf plants but are ineffective on grasses. Broad spectrum post-emergent herbicides may also be used.

It is anticipated that one treatment per year for the first two years would be sufficient to accomplish the project goals. However additional applications may be used, though no greater than two applications will be made per year. The application would typically be accomplished using boom spray equipment attached to an ATV or wheeled tractor. Spot-treatments with a hand-wand attached to an ATV or backpack sprayer may be applied in lieu of broadcast treatments if broadleaf plants are not overly competitive or ubiquitous. Spot-treatments would typically utilize a marker dye to reduce the likelihood of repeat applications.

Mowing: As most of the plant species planned for planting are perennial, mowing will promote root development over vegetative growth, favoring perennial plants not reliant on annual seed set and reducing mowing needs in subsequent years. Some non-native plants are considered compatible with the goals of the re-vegetation effort, including non-native annual grasses and non-invasive, non-native forb species. Mowing would typically be conducted with a tractor mounted mower set 4 to 8 inches above the ground, and would typically be limited to two mowing treatments per year. Weed whacking would be used in lieu of mowing when treatment areas are small in size or inaccessible by mowing equipment, and would also typically be limited to two treatments per year. As described in the Management Measures and Constraints Table, work would be conducted outside of the nesting season or in areas determined to be clear of nesting birds, to prevent impacts to wildlife.

Prioritization of Invasive Species for Management

Invasive plant species have been divided into high priority and moderate priority species. High priority species, such as jubata grass or acacia, will be removed regularly as they would have a detrimental effect on the habitat and would colonize substantial acreage on the site quickly. Moderate priority species are those which either currently exist on the site or are known to exist in relatively close proximity and can have a detrimental impact to re-vegetation efforts, habitat quality, or surrounding land uses such as agriculture or conservation. Moderate priority species are those that are not known to colonize and out-compete native plants to the same degree as high priority species. For those species currently not on site, it would be of significant cost savings in maintenance effort and have significant impact on habitat establishment and quality to remove small to moderate populations as they appear on site and prior to their establishment and

seed set. Each species with a moderate ranking will be evaluated for control over time; ranking and new priority species will be evaluated in coordination with surrounding land managers and growers in the region, and the California Invasive plant council published lists (http://www.cal-ipc.org/paf/). The following is a list of high and moderate priority invasive plant species of concern for this site. These lists may be adjusted over time and the understanding of the site and region develops.

Table 2. Invasive Plant Species Priority Ranking

High Priority		**Moderate Priority**	
Acacia*	*Acacia dealbata*	Bristly Ox-tongue*	*Picris echoides*
Big Perriwinkle	*Vinca major*	Bull Thistle*	*Circium vulgare*
Cala Lilly	*Zantedseschia aethiopica*	Italian Thistle*	*Carduus pycnocephalus*
Cape Ivy	*Delairea odorata*	Poison Hemlock	*Conium maculatum*
English Ivy	*Hedera helix*	Purple Star Thistle	*Centauria calcetrapa*
Eucalyptus	*Eucalptus globulus*		
French Broom	*Genista monspenssulana*		
Fullers Teasel	*Dipsacus sativus*		
Giant Reed	*Arundo donax*		
Himalaya berry	*Rubis discolor*		
Jubata and Pampas Grass*	*Cortaderia Jubata/Cortaderia selloana*		
Parrotfeather	*Myriophylum aquaticum*		
Perrenial pepperweed	*Lepidium latifolium*		
Purple Loosestrife	*Lythrum salicaria*		
Sticky Eupatorium	*Ageratina adenophora*		
Stinkwort	*Detricia graviolens*		
Tocolote, Malta Star Thistle	*Centauria melitensis*		
Water Buttercup	*Ranunculus repens*		
Water hyacinth	*Echhiornia crassipus*		
Yellow Star Thistle	*Centauria solstitialis*		
* Species currently present on site			

Monitoring Requirements and Adaptive Management

Adaptive management will be utilized to support successful implementation to meet project goals. Performance metrics will be utilized as a basis for monitoring, evaluation, and determination of subsequent actions during the monitoring period. The maintenance period for this project is anticipated to be two years. In subsequent years, monitoring and management activities may be conducted as necessary to sustain the goals of the project.

A flow chart of the Adaptive Management process decision tree is shown in Figures 1 and 2, below.

The following performance measures will be used to guide maintenance and adaptive management actions during the maintenance period:

Performance Metric 1: Bare Ground

Bare ground can provide a place for invasive weed seed to establish and is an indicator of failure of seed or container stock to establish or lack of recruitment. Measurement of bare ground will occur outside of seasonal marshes (i.e. in areas above 8' in elevation), as development of mudflats within seasonal marshes are desirable.

Performance Monitoring

Monitoring will be conducted along temporary 50 meter transect lines located along permanent transects that run parallel in the north-south direction. Vegetative cover will be measured through collection of values using the point intercept method. Permanent transect lines will be established through a random selection process. A sufficient number of points will be collected to achieve statistical significance in the monitoring data. Monitoring will be stratified within vegetation types, including wet meadow and native grassland, so as to link areas which do not meet the performance metric by location and site condition.

Monitoring will be conducted two years after planting.

Performance Metric

After 2 years, bare ground within the limit of disturbance will not exceed 25%, in each of the vegetative communities, excluding areas of mudflats and seasonal marsh.

If the bare ground is less than 40% but greater than 25% and plant establishment appears to be on trajectory to meet the performance metric in the third year after planting, adaptive management actions may be delayed for a year, with monitoring repeated after that time. Otherwise adaptive management actions will be taken as described below.

If bare ground exceeds 40% two years after planting then adaptive management actions will be taken.

If this performance metric is met, monitoring for this criterion will be discontinued. If this performance metric is not met, adaptive management actions will be taken, and monitoring will be conducted again after a 2 year interval. This process will continue until the performance metric is met.

Adaptive Management and Maintenance Actions

Factors most likely to contribute to persistent bare ground include insufficient rainfall to support germination and growth of plant species or use of improper seeding or planting technique. Herbivory of seeded plant species can be a factor adjacent to wetlands, but is not expected due to the current low presence of duck and rabbit species within the areas of seeding.

Those areas that exceed the criteria for bare ground will require corrective actions until the performance metric is achieved. These may include additional installation of plant material, additional irrigation, or other management measures to promote plant establishment as identified in Table 1. Management Measures and Measures to Minimize Impacts and Constraints.

Additional installation of plant material will be conducted as needed in areas where the bare ground threshold is not met. Additional planting will most likely be required in areas which appear to be vulnerable to colonization by invasive weeds or with persistent bare ground. Such areas will be re-vegetated utilizing the methods described in this plan as appropriate. If re-vegetation is required, the species mix may be modified to exclude any species which were not successful.

Performance Metric 2: Invasive Plant Species Establishment

Invasive species can limit the establishment of beneficial habitat and present a problem for neighboring agricultural lands and habitat.

Performance Metric and Monitoring

Monitoring will be conducted after two years along temporary 50 meter transect lines located along permanent transects that run parallel in the north-south direction. The extent of invasive plant cover will be established through collection of values using the point intercept method. Permanent transect lines will be established through a random selection process. A sufficient number of points will be collected to achieve statistical significance in the monitoring data. Monitoring will be stratified within vegetation types (i.e. wet meadow, grassland, seasonal wetlands) so as to link areas which do not meet the performance metric by location and site condition. Alternatively, if invasive plants are located in distinct clumps or patches, monitoring efforts will focus on determining distribution and acreage with a hand-held gps recorder and GIS mapping.

Performance Metric

After 2 years, the extent of high priority invasive plant species (Table 2) does not exceed 5% of the vegetative cover and/or moderate priority invasive plant species does not exceed 20% of the vegetative cover within the limit of grading disturbance.

If the performance metric is achieved, monitoring may be terminated and no further actions may be taken. Additional vegetation management may be conducted, at the discretion of the owner, to

enhance the habitat above and beyond this performance metric provided that such actions are consistent with the measures to minimize impacts shown in Table 1.

If the performance metric is not achieved, the Adaptive Management and Maintenance Actions described below will be conducted, and monitoring will be repeated after another two year period in Year 5.

If the performance metric is achieved in Year 5, then monitoring may be terminated and no further actions may be taken. Additional vegetation management may be conducted, at the discretion of the owner, to enhance the habitat above and beyond this performance metric provided that such actions are consistent with the measures to minimize impacts shown in Table 1.

If in Year 5 the performance metric is not achieved, a site assessment will be conducted to identify the factors contributing to the lack of success and develop new approaches. Timing of mechanical and chemical control may be evaluated, as this can be a critical factor in efficacy of maintenance practices.

Additional management actions will be identified and, another round of management actions will be taken. Monitoring will be repeated after another two year period, in Year 7, to test whether the performance metric is achieved. The actions in response to the results will follow the process outlined for Year 5 above.

This site assessment may alternatively determine that no further action is acceptable within the project goals. For example, if moderate priority species are proliferating within the interior of the property, control efforts may cause more damage to habitat or water quality than the impacts of the invasive plants on habitat or surrounding land uses. Similarly, if the presence of invasive species is not impairing habitat or the recruitment or establishment of desirable vegetation, no further action may be warranted.

If the site assessment leads to the conclusion that no further action is necessary to achieve project goals, no further management actions will be taken. The assessment will develop additional monitoring criteria to verify the project goals are being met. Monitoring will be repeated after another two year period, in Year 7, based on both the original monitoring protocol and these additional criteria. If this monitoring determines that the goals are being met, then no further monitoring will be conducted. If this monitoring determines that the goals are not being met, management actions will be taken consistent with Table 1 and/or a new site assessment will be conducted following the process described for Year 5 above.

Adaptive Management and Maintenance Actions

Factors most likely to contribute to high percent cover of invasive plants species include insufficient germination or growth of seeded plant species due to problems associated with installation efforts, inadequate site preparation, inadequate maintenance during the establishment period, including timing of herbicide use, or the competitive advantage of the invasive species.

Areas that exceed the percent cover metric for high and moderate priority invasive plant species will be treated to reduce the invasive plant species present.

While there are a variety of effective methods for control and on-site eradication of invasive plant species, the primary methods for removal include hand grubbing, mechanical such as scraping or discing (areas within constrained area), mowing and herbicide application. Maintenance actions that include intensive soil disturbance such as scrapping or discing will be accompanied by re-vegetation efforts such as seeding or transplanting. Proportions of species within the seed mixes and container stock lists in Appendix B and C will be determined based on site conditions, but will emphasize those species that have shown to be successful. For each invasive plant species the most effective and efficient means of control will be utilized in a manner that takes into consideration the phenology of the plant species, likelihood of spread, impact on habitat, impact of the control efforts on wildlife, water quality and habitat, and the impact of the particular invasive plant on surrounding land uses.

All management actions will be conducted in a manner consistent with Table 1. Management Measures and Measures to Minimize Impacts.

Figure 1. Adaptive Management and Performance Monitoring for Bare Ground Performance Metric

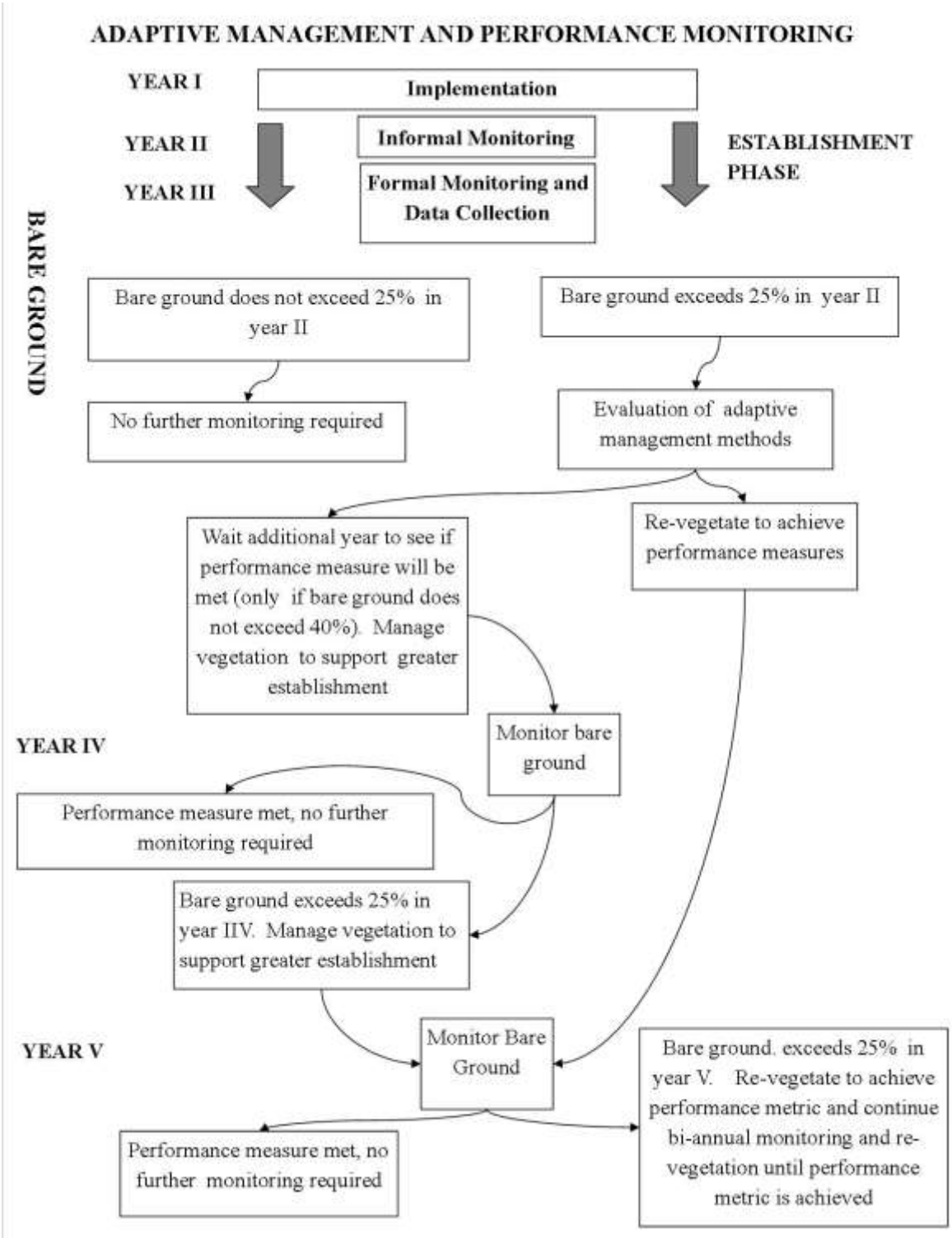
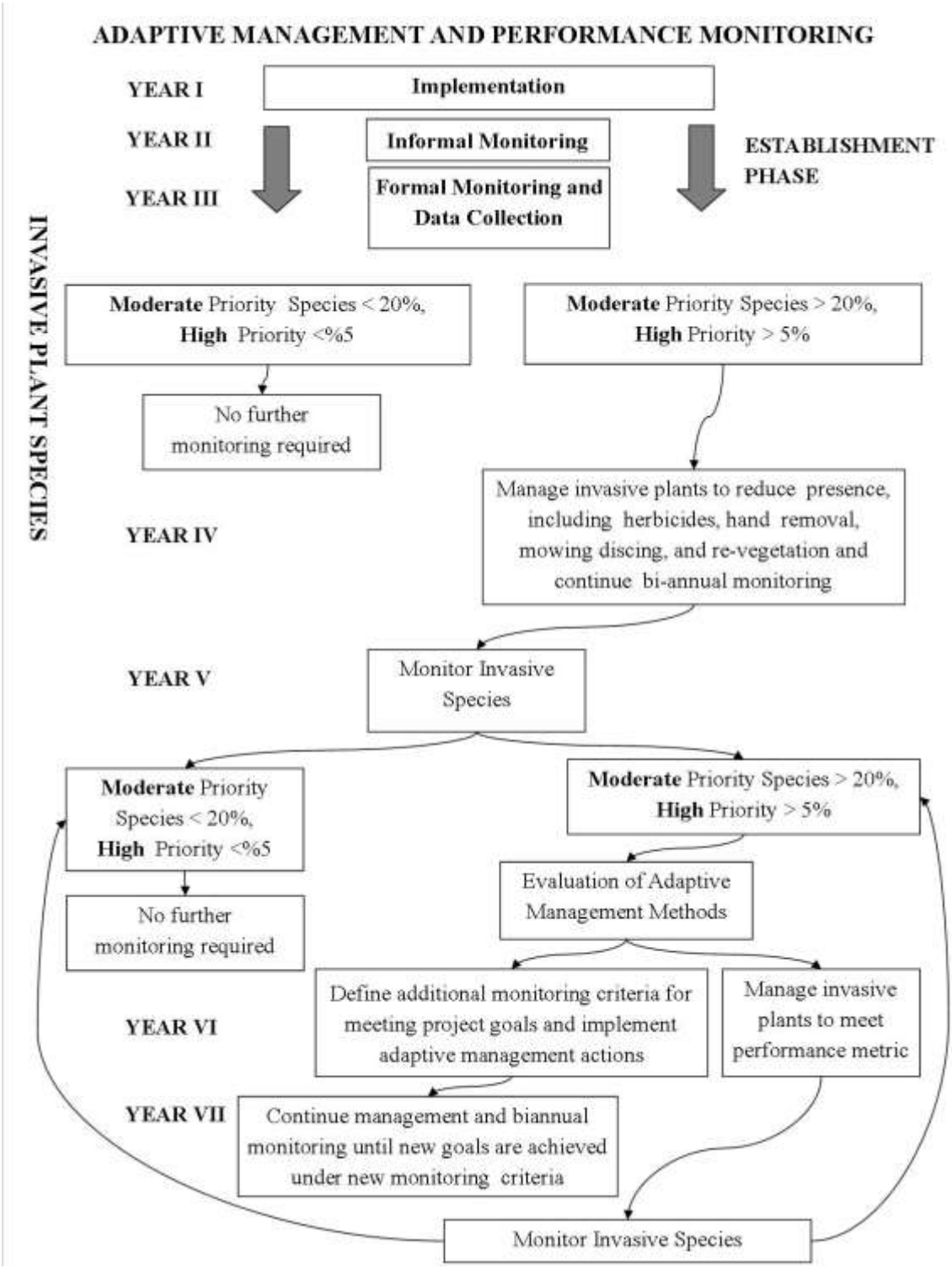


Figure 2. Adaptive Management and Performance Monitoring for Invasive Plant Species Performance Metric



Maintenance Beyond the Vegetation Establishment Period

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As a typical practice, a minimum 30 foot buffer from any areas adjacent to neighboring farmland may be mowed periodically if there are invasive seed borne plants, such as non-native thistle species. A mowed buffer will alleviate concerns on the part of surrounding landowners and growers related to food safety, fuel load, and the spread of weedy plant species. Mowing may also occur around all irrigation or other property infrastructure such as easement markers, environmental monitoring devices, and the pump house in order to maintain these features.

Beyond the establishment period, vegetation maintenance will focus on the long-term viability of native habitats with actions that support the growth habit of desirable vegetation and control priority invasive plant species. Mowing native plants with a tolerance for this will aid in the long-term viability of native plant populations, as this can reduce non-native and invasive plant cover as well as invigorate the growth of the native plants. The approach to avoid impacts to sensitive species by mowing is outlined above in Table 1. Management Measures and Measures to Minimize Impacts.

If native plant cover is established to the exclusion of undesirable broadleaf weeds, mowing may be conducted within 5 to 10 acres every 2 -4 years for the purpose of invigorating native grass species and reducing the likelihood of invasion by aggressive invasive forb species. The mower would be set no lower than 4" in order to retain a thatch layer, important for exclusion of invasive broadleaf weeds, as well as for the benefit of wildlife species. Spot treatment of invasive plants may also be conducted using broadleaf or broad spectrum herbicides following the protocols described above. Generally, invasive plants will be managed with an emphasis on priority and resources available, with the purpose of supporting the project goals over time. Additional vegetation management measures such as selective mowing or removal of invasive plants through other means such as weed whacking, herbicide, and hand pulling will be utilized to reduce establishment and persistence of undesirable plant species on the property. Long-term maintenance work will follow the guidelines listed in Table 1. Management and Measures to Minimize Impacts.

Table 3. Implementation and Operations Schedule for Establishing Plant Material from Transplant and Seed

Implementation and Establishment Period Operations Schedule - Establishing Plant Material with Seed													
	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Monitoring and Adaptive Management As Needed
Site Preparation													
Disc site 1-3x													
Ring roll/cutipack site													
Field cultivator/tined cultivator													
Implementation													
Broadcast/drill seed													
Ring roll/cultipack site													
Maintenance													
Mow 2 x 3 times													
Herbicide application 1 x 2 times													
Hand Removal of Invasive Weeds													
Mechanical weed control (non-tractor mounted)													
Monitoring													
Peformance monitoring													

Implementation and Establishment Period Operations Schedule - Establishing Plant Material with Transplants													
Vegetation Management, Maintenance, and Monitoring	**Year I**				**Year II**				**Year III**				**Year IV**
	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Monitoring and Adaptive Management As Needed
Site Prepration													
Disc site 1 -3x													
Chisell plow													
Ring roll/culitpack site 2x													
Field cultivator/tined culitvator													
Installation													
Sow native seed													
Transplant plugs													
Irrigation													
Maintenance													
Mow 1 x 3 times													
Herbicide application 1 x 2 times													
Hand Removal of Invasive Weeds													
Mechanical weed control (non-tractor mounted)													
Monitoring													
Peformance monitoring													

Appendices:

Appendix A. Site Maps
Appendix B. Specifications for Establishing Plant Material by Seed, Budget
Appendix C. Specifications for Establishing Plant Material with Intensive Transplanting, Budget
Appendix D. Vegetation Establishment Recommendation Memo: 6/2013

Appendix A. Site Maps

Figure 1.

Figure 2.


Re-vegetation and Vegetation Management Plan
Bryant Habert Property
60% Grading Plan
Legend
contours
Re-vegetation/ Vegetation Management
Seasonal Wetland Enhancement 7' - 8'
Seasonal Wetland Enhancement 8' -9'
Wet Meadow Enhancement
Native Grassland Enhancement
Existing Vegetation Type
Open Water, Mud Flats
Low Seasonal Marsh
High Seasonal Marsh
Willow scrub
Existing Stands of Desirable Vegetation
0 125 250 500
Feet

Appendix B. Specifications for Establishing Plant Material by Seed

Seeding Quantities:

Seasonal Wetland Enhancement I Seeding Quantities, Establishing Plant Material by Seed			
7' - 8' elevation range			
Species	Common Name	Sowing Rate (PLS): Lbs/Acre	Total Quantity Pure Live Seed (Lbs)
Bidens laevis	Marsh marigold	5.0	1.0
Helenium puberium	Sneezeweed	5.0	1.0
Mimulus guttatus	Seep monkey flower	2.0	0.4
Scirpus robustus	Prairie bulrush	5.0	1.0
Total		17.0	3.4

Seasonal Wetland Enhancement II, Establishing Plant Material by Seed			
8' - 9' Elevation range			
Speceis	Common Name	Sowing Rate (PLS): Lbs/Acre	Total Quantity Pure Live Seed (Lbs)
Elymus glaucus	Blue wild rye	2.0	2.8
Epilobium densiflorum	Dense flowered boidsvaldia	1.0	1.4
Helenium puberium	Sneezeweed	3.0	4.2
Hordeum bracyantherum	Meadow barley	6.0	8.4
Juncus effusis	Bog rush	1.0	1.4
Juncus patens	Spreading rush	1.0	1.4
Scirpus robustus	Priarie bullrush	1.0	1.4
Total		15.0	21.0

Native Grassland Enhancement Seed Quantities, Establishing Plant Material by Seed			
Species		Sowing Rate (PLS): Lbs/Acre	Total Quantity Pure Live Seed (Lbs)
Achillea mellifolium	Yarrow	0.3	0.4
Bromus carinatus	California Brome	5.0	6.5
Elymus glaucus	Blue wildrye	5.8	7.5
Horkelia cuneata	Wavy-leafed horkelia	0.2	0.2
Hordeum bracyantherum	Meadow barley	6.2	8.0
Nassella pulchra	Purple needle grass	8.6	11.2
Sisyrinchium bellum	Blue eyed grass	1.5	1.9
Total		27.5	35.8

Wet Meadow Enhancement Seed Quantities, Establishing Plant Material by Seed			
Species		Sowing Rate (PLS): Lbs/Acre	Total Quantity Pure Live Seed (Lbs)
Grasses and other Monocots			
Bulboschoenus robustus	Prairie Bulrush	0.2	1.5
Carex barbarae	Santa Barbara Sedge	0.2	1.4
Carex densa	Dense Sedge	0.4	2.8
Cyperus eragrostis	Nut Sedge	1.0	8.0
Echinochloa crus-galli	Barnyard Grass	1.1	8.5
Elymus glaucus	Blue wild rye	7.9	63.3
Hordeum bracyantherum	Meadow barley	7.5	60.3
Juncus effusis	Bog rush	0.1	0.8
Juncus patens	Spreadng rush	0.1	0.8
Paspalum distichum	Ditchgrass	1.0	8.1
Subtotal		19.4	155.5
Forbs			
Achillea millefolium	Yarrow	0.0	0.3
Artemesia douglasiana	Mugwort	0.1	1.1
Baccharis douglausii	Marsh Baccharis	0.1	0.5
Epilobium densiflorum	Dense flowered boidsvaldia	0.2	1.5
Euthamia occidentalis	Marsh goldenrod	0.1	1.2
Helenium puberium	Sneezeweed	0.0	0.3
Oenothera hookerii	Evening primrose	0.1	0.6
Subtotal		0.7	5.6
Total		20.1	161.1

Budget Summary:

Establishing Plant Material by Seed	
Site Preparation for Invasive Weed Control Prior to Grading and Excavation	$15,000
Vegetation Establishment	$25,522
Maintenance	$29,250
Biological Monitoring	$4,800
Subtotal	$74,572
Contingency (5%)	$3,729
Total	$78,300

Establishing Plant Material by Seed	
Cost Estimate By Year	
Year I	$10,740
Year II	$32,182
Year III	$15,825
Year IV	$15,825
Subtotal	$74,572
Contingency (5%)	$3,729
Total	$78,300

Budget Detail:

Establishing Plant Material By Seed							
Site Preparation for Invasive Weed Control Prior to Grading and Excavation (Year I,II)							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Site Preparation	Survey site for desirable vegetatio	14	$50	$700	$0	$0	$700
	Generate map	4	$50	$200	$0	$0	$200
	Mowing to facilitate discing	14	$50	$700	$500	$0	$1,200
	Coordinate discing	6	$50	$300	$0	$0	$300
	Contract discing	0	$0	$0	$1,500	$0	$1,500
	Biological monitor	0	$0	$0	$480	$0	$480
Total				**$1,900**	**$2,480**	**$0**	**$4,380**
Year I Estimate (3x/year)	**$10,740**						
Year II Estimate (2x/year)	**$6,660**						

Vegetation Establishment (Year II)							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Project Planning	Planning and coordination	40	$50	$2,000	$0	$0	$2,000
Enhancement of existing stands of desirable vegetation	Hand weeding to remove invasive species within desirable vegetation patches	20	$50	$1,000	$600	$0	$1,600
Seed Bed Cultivation	Rip, disc, chisel, ring roll	12	$50	$600	$4,800	$0	$5,400
Seasonal Marsh Enhancement (seeding)	Seed collection	6	$50	$300	$0	$0	$300
	Seeding and seeding mixture prep. and processing	14	$50	$700	$0	$504	$1,204
Wet Meadow Enhancement	Seed collection	35	$50	$1,750	$0	$0	$1,750
	Seeding and seeding mixture prep. and processing	86	$50	$4,300	$400	$6,273	$10,973
Native Grassland Enhancement	Seeding and seeding mixture prep. and processing	12	$50	$600	$0	$1,695	$2,295
Total				**$11,250**	**$5,800**	**$8,472**	**$25,522**

Maintenance 2 yrs (Year III, IV)							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Mowing	3x/year	78	$50	$3,900	$3,600	$300	$7,800
Herbicide	2x/year	16	$50	$800	$8,500	$0	$9,300
String Trimming		20	$50	$1,000	$0	$50	$1,050
Hand Removal		60	$50	$3,000	$1,800	$0	$4,800
Flame weeding	1x/year	6	$50	$300	$1,200	$0	$1,500
Monitoring for maintenance needs	24x/year	96	$50	$4,800	$0	$0	$4,800
Biological Monitoring	5x/year	0	$0	$0	$2,400	$0	$2,400
Total				**$13,800**	**$17,500**	**$350**	**$31,650**

Detailed Seeding Tables:

Wet Meadow Enhancement Detailed Seeding Table											
Total number of germinating seeds desired per square foot							55			Total Acres	8
Species		% desired proportion	seed per square foot	% purity of seed lot	% germination of seed lot	Estimated PLS% (% purity x % germ.)	estimated # of seeds per pound	Lbs/Acre (PLS)	Estimated Bulk Rate (lbs.)	Total PLS Qty (Lbs)	Total Estimated Bulk (lbs.)
Grasses and other Monocots											
Bulboschoenus robustus	Prairie Bulrush	1%	0.6	70%	40%	28.0%	450,000	0.2	0.7	1.5	5.4
Carex barbarae	Santa Barbara Sedge	1%	0.6	75%	40%	30.0%	450,000	0.2	0.6	1.4	4.7
Carex densa	Dense Sedge	2%	1.1	75%	40%	30.0%	450,000	0.4	1.2	2.8	9.5
Cyperus eragrostis	Nut Sedge	10%	5.5	75%	40%	30.0%	800,000	1.0	3.3	8.0	26.6
Echinochloa crus-galli	Barnyard Grass	5%	2.8	70%	40%	28.0%	400,000	1.1	3.8	8.5	30.5
Elymus glaucus	Blue wild rye	25%	13.8	80%	70%	56.0%	134,900	7.9	14.1	63.3	113.1
Hordeum bracyantherum	Meadow barley	20%	11.0	90%	70%	63.0%	100,800	7.5	12.0	60.3	95.7
Juncus effusis	Bog rush	8%	4.4	90%	80%	72.0%	2,800,000	0.1	0.1	0.8	1.1
Juncus patens	Spreadng rush	8%	4.4	90%	80%	72.0%	2,800,000	0.1	0.1	0.8	1.1
Paspalum distichum	Ditchgrass	10%	5.5	75%	70%	52.5%	450,000	1.0	1.9	8.1	15.4
Subtotal		**90%**						**19.4**	**37.9**	**155.5**	**303.0**
Achillea millefolium	Yarrow	1%	0.6	50%	40%	20.0%	2,770,000	0.0	0.2	0.3	1.7
Artemesia douglasiana	Mugwort	1%	0.6	70%	70%	49.0%	341,800	0.1	0.3	1.1	2.3
Baccharis douglausii	Marsh Baccharis	2%	1.1	40%	60%	24.0%	3,000,000	0.1	0.3	0.5	2.2
Epilobium densiflorum	Dense flowered boidsval	1%	0.6	40%	40%	16.0%	824,000	0.2	1.1	1.5	9.1
Euthamia occidentalis	Marsh goldenrod	3%	1.7	40%	40%	16.0%	3,000,000	0.1	0.9	1.2	7.5
Helenium puberium	Sneezeweed	1%	0.6	40%	50%	20.0%	2,770,000	0.0	0.2	0.3	1.7
Oenothera hookerii	Evening primrose	1%	0.6	40%	60%	24.0%	1,400,000	0.1	0.3	0.6	2.4
Subtotal		**10%**						**0.7**	**3.4**	**5.6**	**26.9**
Total		**100%**	**55.0**					**20.1**	**41.2**	**161.1**	**330.0**

Native Grassland Enhancement Detailed Seeding Table											
Total number of germinating seeds desired per square foot							50			Total Acres	1.3
Species		% desired proportion	seed per square foot	% purity of seed lot	% germination of seed lot	Estimated PLS% (% purity x % germ.)	estimated # of seeds per pound	Lbs/Acre (PLS)	Estimated Bulk Rate	Total PLS Qty (Lbs)	Total Estimated Bulk
Achillea mellifolium	Yarrow	5%	2.5	20%	70%	14.00%	2,770,000	0.3	2.0	0.4	2.6
Bromus carinatus	California Brome	15%	7.5	90%	70%	63.00%	103,000	5.0	8.0	6.5	10.4
Elymus glaucus	Blue wildrye	23%	11.3	90%	70%	63.00%	134,900	5.8	9.1	7.5	11.9
Horkelia cuneata	Wavy-leafed horkelia	5%	2.5	50%	70%	35.00%	1,850,000	0.2	0.5	0.2	0.6
Hordeum bracyantherum	Meadow barley	18%	9.0	90%	70%	63.00%	100,800	6.2	9.8	8.0	12.7
Nassella pulchra	Purple needle grass	25%	12.5	60%	70%	42.00%	150,000	8.6	20.5	11.2	26.7
Sisyrinchium bellum	Blue eyed grass	9%	4.5	95%	70%	66.50%	200,000	1.5	2.2	1.9	2.9
Total		**100%**	**49.8**					**27.5**	**52.2**	**35.8**	**67.8**

Appendix C. Specifications for Establishing Plant Material with Intensive Trasplanting:

Seeding Quantities:

Seasonal Wetland Enhancement I Seeding Quantities, Establishing Plant Material by Seed			
7' - 8' elevation range			
Species	**Common Name**	**Sowing Rate (PLS): Lbs/Acre**	**Total Quantity Pure Live Seed (Lbs)**
Bidens laevis	Marsh marigold	5.0	1.0
Helenium puberium	Sneezeweed	5.0	1.0
Mimulus guttatus	Seep monkey flower	2.0	0.4
Scirpus robustus	Prairie bulrush	5.0	1.0
Total		17.0	3.4

Seasonal Wetland Enhancement II, Establishing Plant Material by Seed			
8' - 9' Elevation range			
Speceis	**Common Name**	**Sowing Rate (PLS): Lbs/Acre**	**Total Quantity Pure Live Seed (Lbs)**
Elymus glaucus	Blue wild rye	2.0	2.8
Epilobium densiflorum	Dense flowered boidsvaldia	1.0	1.4
Helenium puberium	Sneezeweed	3.0	4.2
Hordeum bracyantherum	Meadow barley	6.0	8.4
Juncus effusis	Bog rush	1.0	1.4
Juncus patens	Spreading rush	1.0	1.4
Scirpus robustus	Priarie bullrush	1.0	1.4
Total		15.0	21.0

Wet Meadow Enhancement Seed Quantity, Establishing Plant Material with Transplants			
Species		**Lbs/Acre (PLS)**	**Total PLS Qty (Lbs)**
Grasses and other Monocots			
Bulboschoenus robustus	Prairie Bulrush	0.09	0.69
Carex barbarae	Santa Barbara Sedge	0.08	0.64
Carex densa	Dense Sedge	0.16	1.29
Cyperus eragrostis	Nut Sedge	0.45	3.63
Echinochloa crus-galli	Barnyard Grass	0.49	3.88
Elymus glaucus	Blue wild rye	3.60	28.79
Hordeum bracyantherum	Meadow barley	3.42	27.40
Juncus effusis	Bog rush	0.04	0.35
Juncus patens	Spreadng rush	0.04	0.35
Paspalum distichum	Ditchgrass	0.46	3.68
Subtotal		8.84	70.70
Forb Species			
Achillea millefolium	Yarrow	0.02	0.16
Artemesia douglasiana	Mugwort	0.06	0.52
Baccharis douglausii	Marsh Baccharis	0.03	0.24
Epilobium densiflorum	Dense flowered boidsvaldia	0.08	0.66
Euthamia occidentalis	Marsh goldenrod	0.07	0.54
Helenium puberium	Sneezeweed	0.02	0.16
Oenothera hookerii	Evening primrose	0.03	0.26
Subtotal		0.32	2.54
Total		9.15	73.23

Native Grassland Enhancement, Seeding Quantity, Establishing Plant Material with Trasplants			
Species		**Lbs/Acre (PLS)**	**Total PLS Qty (Lbs)**
Achillea mellifolium	Yarrow	0.1	0.2
Bromus carinatus	California Brome	2.5	3.3
Elymus glaucus	Blue wildrye	2.9	3.7
Horkelia cuneata	Wavy-leafed horkelia	0.1	0.1
Hordeum bracyantherum	Meadow barley	3.1	4.0
Nassella pulchra	Purple needle grass	4.3	5.6
Sisyrinchium bellum	Blue eyed grass	0.7	1.0
Total		13.8	17.9

Budget Summary:

Establishing Plant Material with Transplants	
Site Preparation for Invasive Weed Control Prior to Grading and Excavation	$15,000
Vegetation Establishment	$91,488
Maintenance	$41,840
Biological Monitoring	$5,400
Subtotal	$153,728
Contingency (5%)	$7,686.40
Total	$161,414.31

Cost Estimate By Year	
Year I	$10,740
Year II	$98,148
Year III	$22,420
Year IV	$22,420
Subtotal	$153,728
Contingency (5%)	$7,686.40
Total	$161,414.31

It should be noted that the unit cost of purchase for transplant plugs is the one of most significant cost factor for budgetary planning. Moderate cost estimates were used for the above cost estimate. It is reasonable to assume that this cost could be lowered at the time of implementation. See detailed transplant tables for further detail.

Budget Detail:

Establishing Plant Material By Transplant							
Site Prepration for Invasive Weed Control Prior to Grading and Excavation							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Site Preperation	Survey site for desirable vegetation	14	$50	$700	$0	$0	$700
	Generate map	4	$50	$200	$0	$0	$200
	Mowing to facilitate discing	14	$50	$700	$500	$0	$1,200
	Coordinate discing	6	$50	$300	$0	$0	$300
	Contract discing	0	$0	$0	$1,500	$0	$1,500
	Biological monitor	0	$0	$0	$480	$0	$480
Total				**$1,900**	**$2,480**	**$0**	**$4,380**
Year I Estimate (3x/year)	**$10,740**						
Year II Estimate (2x/year)	**$6,660**						

Vegetation Establishment (Year II)							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Project Implementation Planning	Planning and coordination	40	$50	$2,000	$600	$0	$2,600
Enhancement of existing stands of desirable vegetation	Hand weeding to remove invasive species within desirbale vegetation patches	24	$50	$1,200	$600	$0	$1,800
Seed Bed Cultivation	Rip, disc, chissel, ring roll	16	$50	$800	$6,600	$0	$7,400
Seasonal Marsh Enhancement (seeding)	Seed collection	4	$50	$200	$0	$0	$200
	Seeding and seeding mixture prep. and processing	18	$50	$900	$504	$0	$1,404
Wet Meadow Enhancement	Seed collection	11	$50	$550	$0	$0	$550
	Seeding and seeding mixture prep. and processing	70	$50	$3,500	$800	$4,562	$8,862
	Transplanting	168	$50	$8,400	$12,000	$40,941	$61,341
Native Grassland Enhancement	Seeding and seeding mixture prep. and processing	12	$50	$600	$0	$1,356	$1,956
	Transplanting	24	$50	$1,200	$1,820	$2,355	$5,375
Total				**$16,150**	**$20,504**	**$46,859**	**$91,488**

Maintenance 2yrs (Year III, IV)							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Irrigation	Installation	40	$50	$2,000	$5,000	$0	$7,000
	Maintenance	100	$50	$5,000	$0	$0	$5,000
Mowing	3x/year	84	$50	$4,200	$2,400	$0	$6,600
Herbicide	2x/year	16	$50	$800	$8,500	$0	$9,300
Flame weeding	1x	6	$50	$300	$1,440	$0	$1,740
String Trimming		20	$50	$1,000	$0	$0	$1,000
Hand Removal		80	$50	$4,000	$2,400	$0	$6,400
Monitoring for maintenance needs	24x/year	96	$50	$4,800	$0	$0	$4,800
Biological Monitoring	5x/year	0	$0	$0	$3,000	$0	$3,000
Total				**$22,100**	**$22,740**	**$0**	**$44,840**

Detailed Seeding and Transplant Tables:

Seeding Tables:

Wet Meadow Enhancement Seeding List, Seeding Quantity, Establishing Plant Material with Transplants											
Total number of germinating seeds desired per square foot							25			Total Acres	8
Species		**% desired proportion**	**seed per square foot**	**% purity of seed lot**	**% germination of seed lot**	**Estimated PLS% (% purity x % germ.)**	**estimated # of seeds per pound**	**Lbs/Acre (PLS)**	**Estimated Bulk Rate (lbs.)**	**Total PLS Qty (Lbs)**	**Total Estimated Bulk (lbs.)**
Grasses and other Monocots											
Bulboschoenus robustus	Prairie Bulrush	1%	0.3	70%	40%	28.0%	450,000	0.1	0.3	0.7	2.5
Carex barbarae	Santa Barbara Sedge	1%	0.3	75%	40%	30.0%	450,000	0.1	0.3	0.6	2.1
Carex densa	Dense Sedge	2%	0.5	75%	40%	30.0%	450,000	0.2	0.5	1.3	4.3
Cyperus eragrostis	Nut Sedge	10%	2.5	75%	40%	30.0%	800,000	0.5	1.5	3.6	12.1
Echinochloa crus-galli	Barnyard Grass	5%	1.3	70%	40%	28.0%	400,000	0.5	1.7	3.9	13.9
Elymus glaucus	Blue wild rye	25%	6.3	80%	70%	56.0%	134,900	3.6	6.4	28.8	51.4
Hordeum bracyantherum	Meadow barley	20%	5.0	90%	70%	63.0%	100,800	3.4	5.4	27.4	43.5
Juncus effusis	Bog rush	8%	2.0	90%	80%	72.0%	2,800,000	0.0	0.1	0.3	0.5
Juncus patens	Spreadng rush	8%	2.0	90%	80%	72.0%	2,800,000	0.0	0.1	0.3	0.5
Paspalum distichum	Ditchgrass	10%	2.5	75%	70%	52.5%	450,000	0.5	0.9	3.7	7.0
Subtotal		**90%**						**8.8**	**17.2**	**70.7**	**137.7**
Achillea millefolium	Yarrow	1%	0.3	50%	40%	20.0%	2,770,000	0.0	0.1	0.2	0.8
Artemesia douglasiana	Mugwort	1%	0.3	70%	70%	49.0%	341,800	0.1	0.1	0.5	1.1
Baccharis douglausii	Marsh Baccharis	2%	0.5	40%	60%	24.0%	3,000,000	0.0	0.1	0.2	1.0
Epilobium densiflorum	Dense flowered boidsvaldia	1%	0.3	40%	40%	16.0%	824,000	0.1	0.5	0.7	4.1
Euthamia occidentalis	Marsh goldenrod	3%	0.8	40%	40%	16.0%	3,000,000	0.1	0.4	0.5	3.4
Helenium puberium	Sneezeweed	1%	0.3	40%	50%	20.0%	2,770,000	0.0	0.1	0.2	0.8
Oenothera hookerii	Evening primrose	1%	0.3	40%	60%	24.0%	1,400,000	0.0	0.1	0.3	1.1
Subtotal		**10%**						**0.3**	**1.5**	**2.5**	**12.2**
Total		**100%**	**25.0**					**9.2**	**18.7**	**73.2**	**150.0**

Native Grassland Enhancement Seeding Quantity, Establishing Plant Material with Transplants											
Total number of germinating seeds desired per square foot							25			Total Acres	1.3
Species		**% desired proportion**	**seed per square foot**	**% purity of seed lot**	**% germination of seed lot**	**Estimated PLS% (% purity x % germ.)**	**estimated # of seeds per pound**	**Lbs/Acre (PLS)**	**Estimated Bulk Rate**	**Total PLS Qty (Lbs)**	**Total Estimated Bulk**
Achillea mellifolium	Yarrow	5%	1.3	20%	70%	14.00%	2,770,000	0.1	1.0	0.2	1.3
Bromus carinatus	California Brome	15%	3.8	90%	70%	63.00%	103,000	2.5	4.0	3.3	5.2
Elymus glaucus	Blue wildrye	23%	5.6	90%	70%	63.00%	134,900	2.9	4.6	3.7	5.9
Horkelia cuneata	Wavy-leafed horkelia	5%	1.3	50%	70%	35.00%	1,850,000	0.1	0.2	0.1	0.3
Hordeum bracyantherum	Meadow barley	18%	4.5	90%	70%	63.00%	100,800	3.1	4.9	4.0	6.4
Nassella pulchra	Purple needle grass	25%	6.3	60%	70%	42.00%	150,000	4.3	10.3	5.6	13.4
Sisyrinchium bellum	Blue eyed grass	9%	2.3	95%	70%	66.50%	200,000	0.7	1.1	1.0	1.4
Total		**100%**	**24.9**					**13.8**	**26.1**	**17.9**	**33.9**

Transplanting Tables for Container Stock:

Wet Meadow Enhancement Container Plant Species List, 8'-11' Elevation						Acres	8							
Species Name	**Common Name**	**Planting density (feet on center)**	**Site Specific Elevation Range**	**Total**	**Growth Habitat**	**Mowing tolerance**	**Parent Material Available within Watershed**	**Spacing**	**Square feet**	**Per Sq ft Rate**	**On site percentage**	**Total #**	**Unit Cost**	**Total Production Cost**
Baccharis douglausii	Marsh baccharis	1	8' - 9'	19488	Perennial	High	x	1	348000	243600	8.0%	19488	0.15	$2,923
Carex barbarae	Santa Barbara	1	8' - 10'	19488	Perennial	Medium	x	1	348000	243600	8.0%	19488	0.3	$5,846
Carex pallida	Woolley sedge	1	8' - 9'	19488	Perennial	Medium	x	1	348000	243600	8.0%	19488	0.3	$5,846
Elymus glaucus	Blue wild rye	1	9' - 11'	36540	Perennial	High	x	1	348000	243600	15.0%	36540	0.05	$1,827
Elymus triticoides	Creeping wild rye	1	8' 12'	48720	Perennial	High	x	1	348000	243600	20.0%	48720	0.3	$14,616
Euthamia	Marsh goldenrod	1	8' - 10'	24360	Perennial	High	x	1	348000	243600	10.0%	24360	0.15	$3,654
Hordeum	Meadow barley	1	8'- 11'	48720	Perennial	High	x	1	348000	243600	20.0%	48720	0.05	$2,436
Juncus	Brown-headed	1	8' - 9'	2436	Perennial	Medium	x	1	348000	243600	1.0%	2436	0.25	$609
Juncus mexicana	Mexican rush	1	8' - 9'	2436	Perennial	Low	x	1	348000	243600	1.0%	2436	0.25	$609
Oenothera hookerii	Evening primrose	1	8' - 10'	4872	Annual,	Low	x	1	348000	243600	2.0%	4872	0.15	$731
									348000					
Minor Species									348000					
Artemesia	Mugwort	1	8' - 11'	7308	Perennial	Low	x	1	348000	243600	3.0%	7308	0.15	$1,096
Carex obnuta	Slough Sedge	3	8' - 9'	731	Perennial	Medium	x	1	348000	243600	0.3%	731	0.25	$183
Juncus effusis	Bog rush	3	8' - 10'	804	Perennial	Low	x	0.33	348000	80388	1.0%	804	0.15	$121
Juncus patens	Spreading rush	3	8' - 12'	804	Perennial	Medium	x	0.33	348000	80388	1.0%	804	0.15	$121
Juncus xiphoides	Iris leaved rush	1	8' - 9'	487	Perennial	Medium	x	1	348000	243600	0.2%	487	0.25	$122
Rosa californica	California rose	3	9' - 12'	804	Perennial	Low	x	0.33	348000	80388	1.0%	804	0.25	$201
Total				**237486**							**100%**	**237486**		**$40,941**

Native Grassland Enhancement Container Stock table						Acres	1.3							
Species Name	**Common Name**	**Planting density (feet on center)**	**Site Specific Elevation Range**	**Total**	**Growth Habitat**	**Mowing Tollerance**	**Parent Material Available within Watershed**	**Spacing**	**Square feet**	**Per Sq ft Rate**	**On site percentage**	**Total #**	**Unit Cost**	**Total Production Cost**
Achillia mellifolia	Yarrow	1	10' - 12'	3959	Perennial	High	x	1	56550	39585	10%	3958.5	0.1	$396
Carex tumilacola	Hilldweller sedge	1	11' - 12'	396	Perennial	High	x	1	56550	39585	1%	395.85	0.25	$99
Elymus glaucus	Blue wildrye	1	10' - 12'	11876	Perennial	High	x	1	56550	39585	30%	11875.5	0.05	$594
Elymus triticoides	Creeping wildrye	1	10' - 12'	3959	Perennial	High	x	1	56550	39585	10%	3958.5	0.25	$990
Hordeum bracyantherum	Meadow barley	1	10' - 12'	3959	Perennial	High	x	1	56550	39585	10%	3958.5	0.05	$198
Horkelia cuneata	Wavy leafed horkelia	1	10' - 12'	792	Perennial	High	x	1	56550	39585	2%	791.7	0.1	$79
Rosa californica	Wild rose	2	10' - 12'	0	Perennial	Low	x	0.5	1.3	0.455	2%	0.0091	0.25	$0
Sisyrinchium bellum	Blue eyed grass	1	10' - 12'	0	Perennial	Medium	x	1	1.3	0.91	10%	0.091	0.1	$0
Stipa pulchra	purple needle grass	1	11' - 12'	0	Perennial	High	x	1	1.3	0.91	25%	0.2275	0.2	$0
Total				**24939**							**100%**	**24939**		**$2,355**

Appendix C

Construction Cost Estimate

WATERWAYS CONSULTING, INC.

Bryant-Habert/Wait Ecological Restoration Design
ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COSTS

Job No: 12-007 3/11/2014

60% DESIGN LEVEL

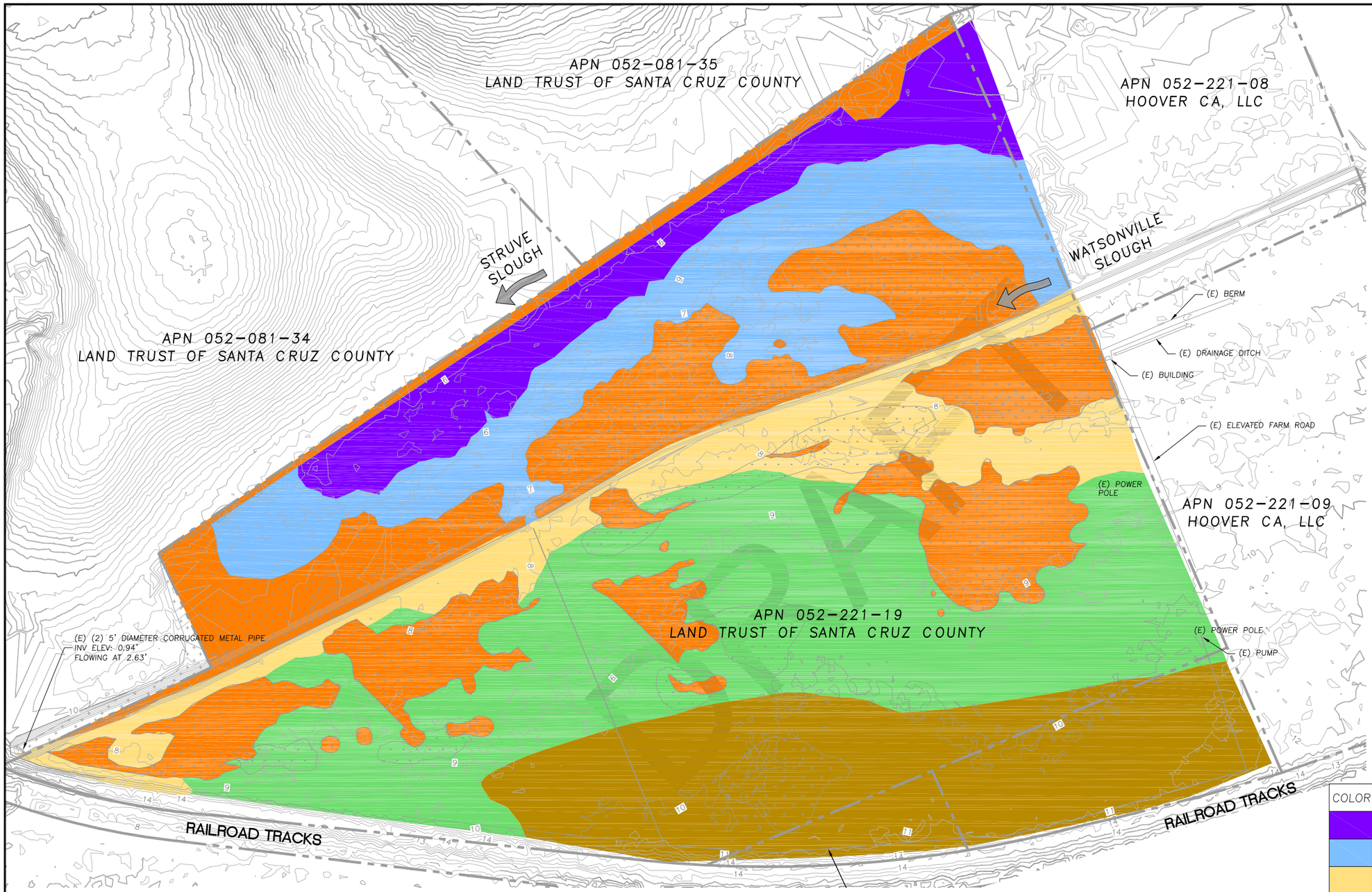
ITEM NO.	ITEM	ESTIMATED QUANTITY	UNIT	UNIT COST	TOTAL
1	MOBILIZATION AND DEMOBILIZATION	1	LS	$ 25,000	$ 25,000
2	SWPPP PREPARATION AND IMPLEMENTATION	1	LS	$ 12,000	$ 12,000
3	EROSION CONTROL	1	LS	$ 16,200	$ 16,200
	FIBER ROLL	2,820	LF	$ 5	
	SILT FENCE	420	LF	$ 5	
4	CLEARING AND GRUBBING	1	LS	$ 7,000	$ 7,000
5	EXCAVATION	11,200	CY	$ 6	$ 67,200
6	FILL	11,200	CY	$ 7	$ 78,400
			SUBTOTAL		$ 205,800
			CONTINGENCIES	25%	$ 51,450
			TOTAL PROJECT COST		$ 257,250

NOTES & ASSUMPTIONS:

1. Quantities shown are approximate only; the Contractor shall be responsible for all work indicated on the Drawings and prescribed in
2. In the event that the product of a unit price and an estimated quantity does not equal the extended amount stated, the unit price will govern and the correct product of the unit price and the estimated quantity shall be deemed to be the bid amount.
3. Long term vegetation and maintenance costs are detailed in the Vegetation Assessment and Baseline Monitoring Report.
4. Refer to Appendices B and C of the Vegetation Management Plan for costs asssociated with revegetation and maintenance.

Appendix D

Concept Level Drawings (Various Alternatives)



SITE PLAN
SCALE: 1"=100'

LEGEND

- EXISTING CONTOURS (85 / 86)
- EXISTING SALIX SPP. DISTRIBUTION
- EXISTING WET MEADOW/SCRUB COMMUNITY
- EXISTING RUDERAL GRASSLAND COMMUNITY
- EXISTING PARCEL BOUNDARY

GRADING SUMMARY -ALTERNATIVE 1

CUT	0 CY
FILL	0 CY
NET	0 CY

COLOR	VEGETATION COMMUNITY	ACRES	% AREA
	OPEN WATER/ MUD FLAT	3.7	8%
	LOW SEASONAL MARSH	6.0	12%
	HIGH SEASONAL MARSH	4.7	10%
	WET MEADOW ENHANCEMENT	12.7	26%
	WILLOW SCRUB	12.7	26%
	NATIVE GRASSLAND ENHANCEMENT	8.4	17%

NOTES:
1. UNDER THIS SCENARIO EXISTING TOPOGRAPHIC CONDITIONS WOULD REMAIN UNDISTURBED.

2. VEGETATION COMMUNITY ENHANCEMENT AREAS SHOWN HEREON WERE DETERMINED BY WATSONVILLE WETLANDS WATCH AND DO NOT NECESSARILY CORRESPOND TO EXISTING ELEVATIONS ON THE PROJECT SITE.

WATERWAYS CONSULTING INC.
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PRELIMINARY

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY

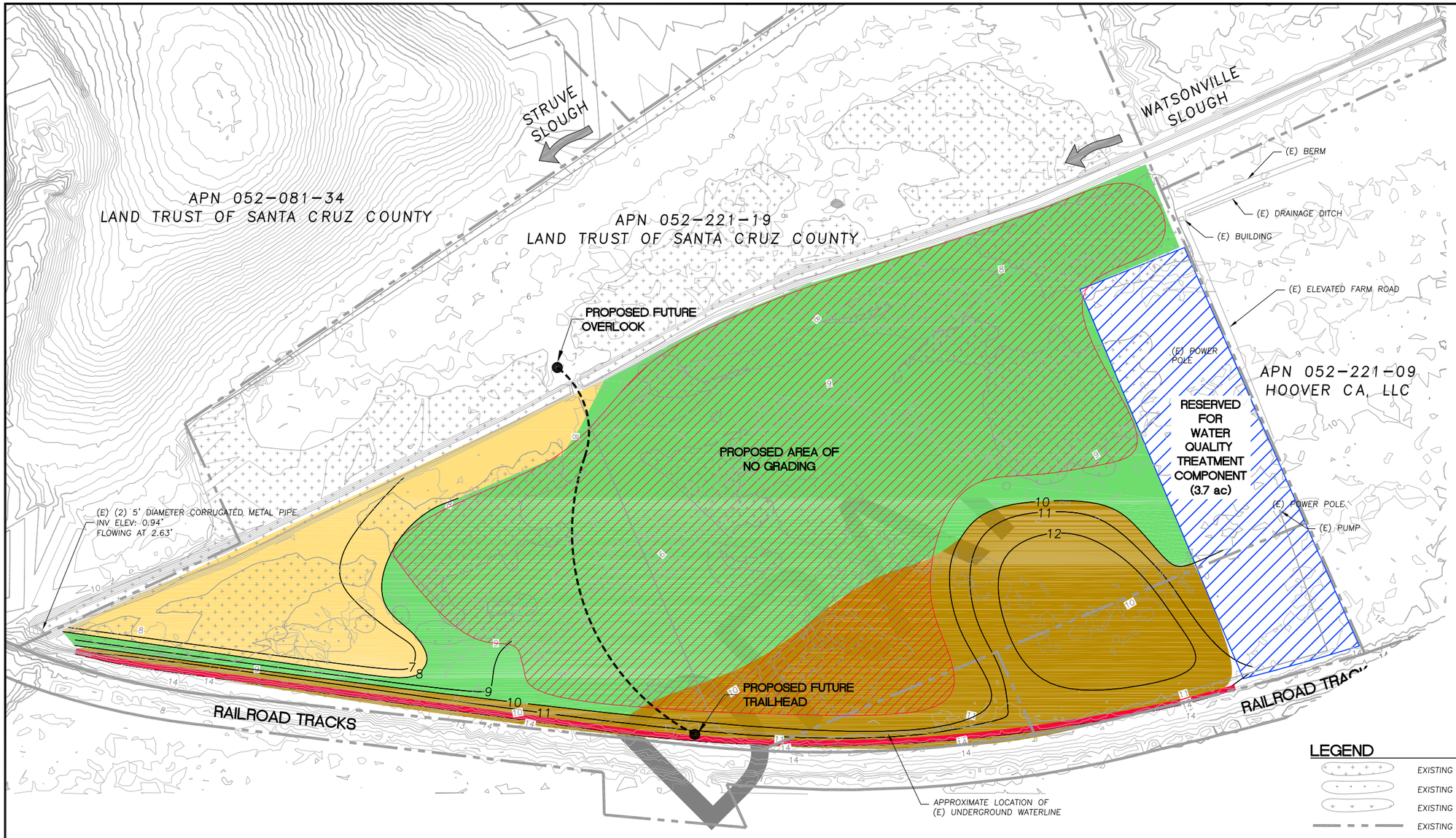
ALTERNATIVE 1

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN CONCEPT LEVEL SUBMITTAL

DESIGNED BY: K.L.N.
DRAWN BY: K.L.N.
CHECKED BY: M.W.W.
DATE: 12/11/12
JOB NO.: 12-007

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

FIG 1 | 1 OF 4



COLOR	VEGETATION COMMUNITY	ELEVATION RANGE	ACRES	% AREA
	LOW SEASONAL MARSH	6'–7'	0	0%
	HIGH SEASONAL MARSH	7'–8'	3.4	12%
	WET MEADOW/ WILLOW SCRUB	8'–10'	16.8	61%
	UPLAND/ GRASSLAND	10'–12'	7.5	27%

SITE PLAN
SCALE: 1"=100'

GRADING SUMMARY -ALTERNATIVE 2

CUT	10,173 CY
FILL	10,354 CY
NET	181 CY

NOTE: MAXIMUM CONSTRUCTED SLOPE SHOULD NOT EXCEED 10

LEGEND

- EXISTING SALIX SPP. DISTRIBUTION
- EXISTING WET MEADOW/SCRUB COMMUNITY
- EXISTING RUDERAL GRASSLAND COMMUNITY
- EXISTING PARCEL BOUNDARY
- EXISTING CONTOURS
- PROPOSED FINISH GRADE CONTOUR
- ×6.5 PROPOSED SPOT GRADE
- LOW SEASONAL MARSH (ELEV 6'–7')
- HIGH SEASONAL MARSH (ELEV 7'–8')
- WET MEADOW/WILLOW SCRUB (ELEV 8'–10')
- UPLAND/GRASSLAND (ELEV 10'–12')
- PROPOSED AREA OF NO GRADING
- PROPOSED WATER QUALITY TREATMENT AREA
- PROPOSED ACCESS ROAD
- FUTURE TRAIL

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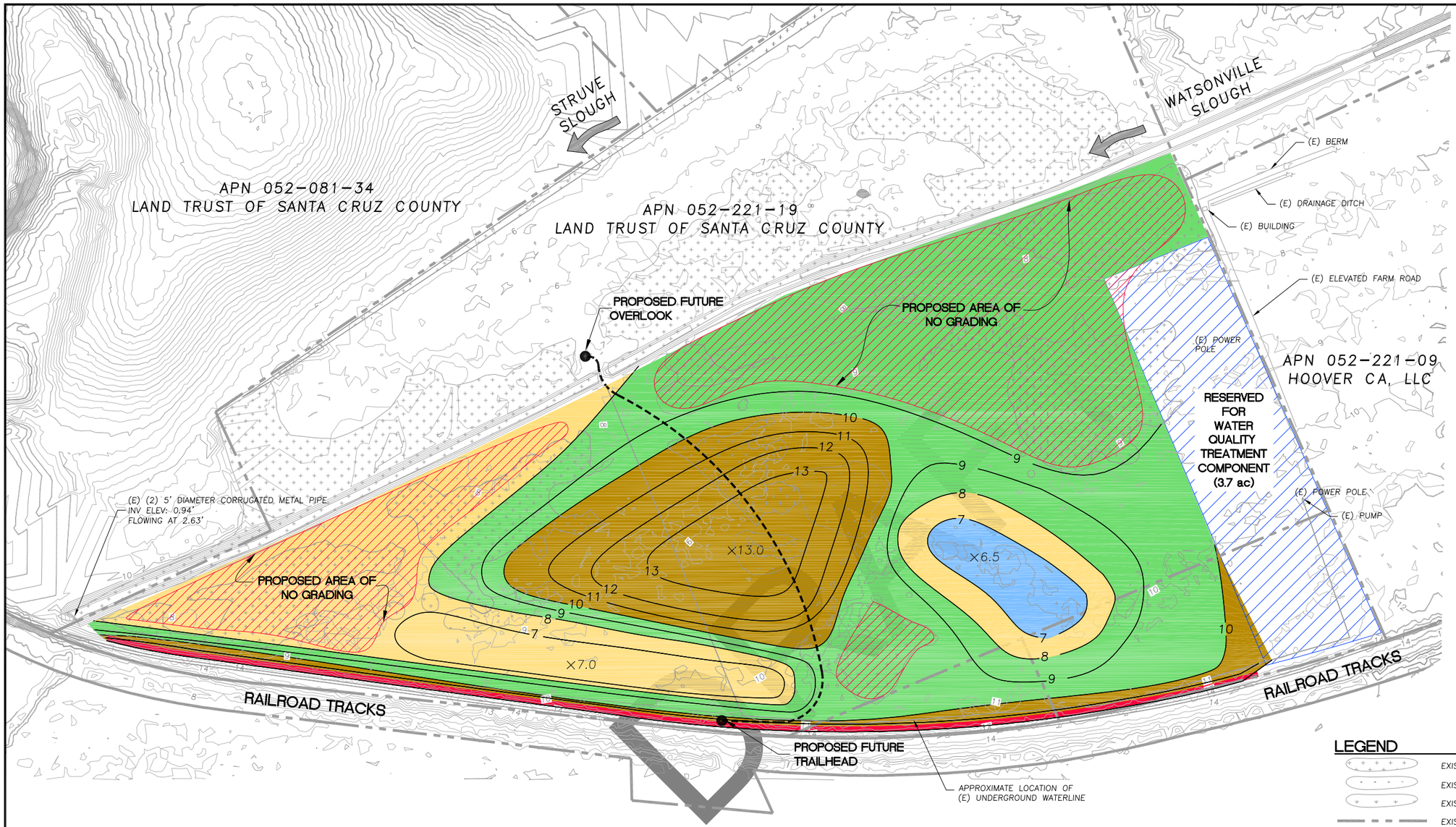
ALTERNATIVE 2

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN CONCEPT LEVEL SUBMITTAL

DESIGNED BY:	K.L.N.
DRAWN BY:	K.L.N.
CHECKED BY:	M.W.W.
DATE:	12/11/12
JOB NO.:	12-007

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

FIG 2 | 2 OF 4



SITE PLAN
SCALE: 1"=100'

COLOR	VEGETATION COMMUNITY	ELEVATION RANGE	ACRES	% AREA
	LOW SEASONAL MARSH	6'–7'	0.7	3%
	HIGH SEASONAL MARSH	7'–8'	5.8	21%
	WET MEADOW/ WILLOW SCRUB	8'–10'	14.6	53%
	UPLAND/ GRASSLAND	10'–12'	6.5	23%

GRADING SUMMARY - ALTERNATIVE 3

CUT	23,463 CY
FILL	21,765 CY
NET	1,758 CY

LEGEND

- EXISTING SALIX SPP. DISTRIBUTION
- EXISTING WET MEADOW/SCRUB COMMUNITY
- EXISTING RUDERAL GRASSLAND COMMUNITY
- EXISTING PARCEL BOUNDARY
- 85 86 EXISTING CONTOURS
- 8 PROPOSED FINISH GRADE CONTOUR
- ×6.5 PROPOSED SPOT GRADE
- LOW SEASONAL MARSH (ELEV 6'–7')
- HIGH SEASONAL MARSH (ELEV 7'–8')
- WET MEADOW/WILLOW SCRUB (ELEV 8'–10')
- UPLAND/GRASSLAND (ELEV 10'–12')
- PROPOSED AREA OF NO GRADING
- PROPOSED WATER QUALITY TREATMENT AREA
- PROPOSED ACCESS ROAD
- FUTURE TRAIL

N

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ALTERNATIVE 3

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
CONCEPT LEVEL SUBMITTAL

DESIGNED BY: K.L.N.
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CHECKED BY: M.W.W.
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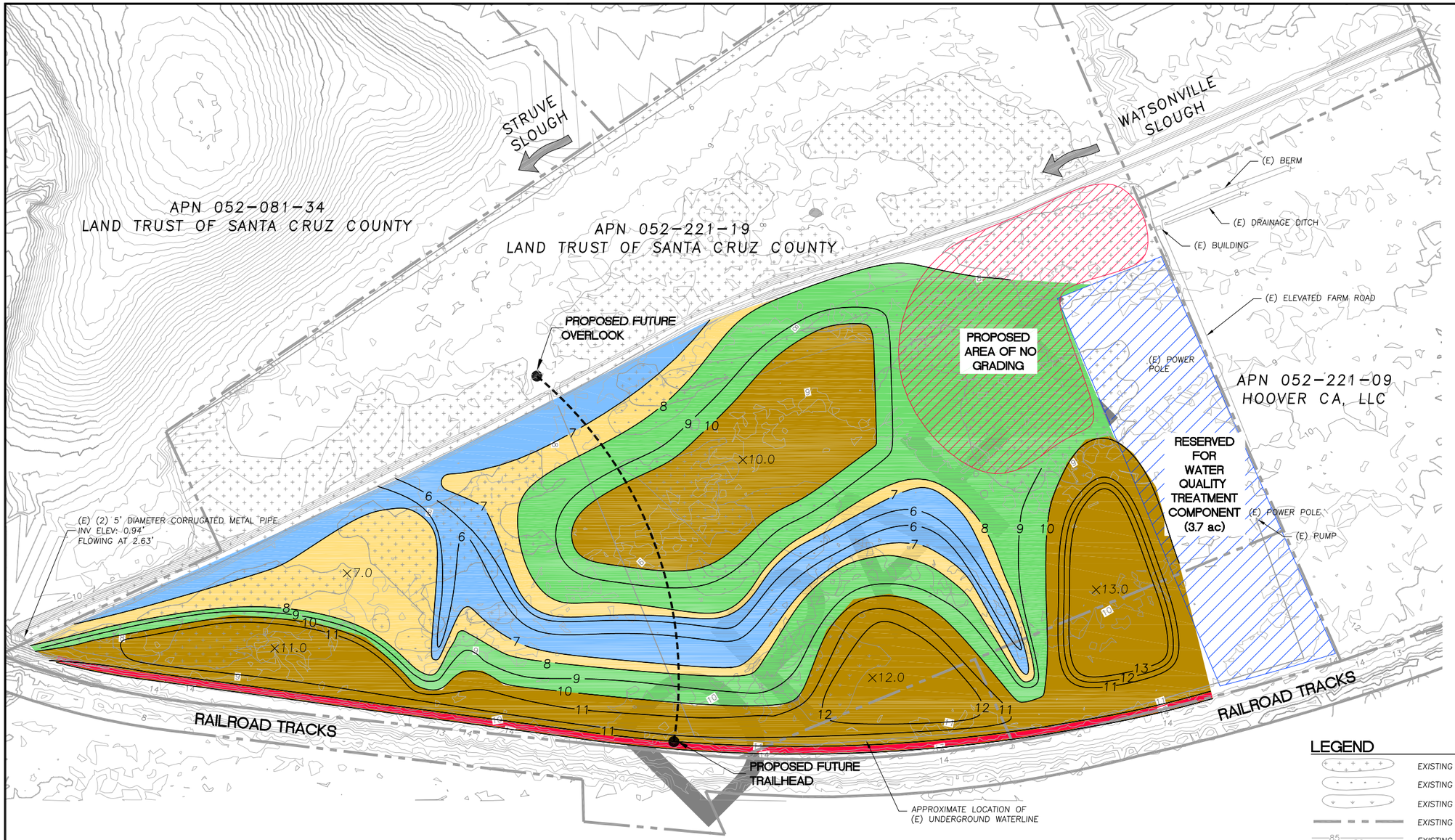
JOB NO.: 12-007

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

FIG 3



SITE PLAN
SCALE: 1"=100'

COLOR	VEGETATION COMMUNITY	ELEVATION RANGE	ACRES	% AREA
	LOW SEASONAL MARSH	6'–7'	3.9	14%
	HIGH SEASONAL MARSH	7'–8'	4.7	17%
	WET MEADOW/ WILLOW SCRUB	8'–10'	8.8	32%
	UPLAND/ GRASSLAND	10'–12'	10.5	38%

GRADING SUMMARY – ALTERNATIVE 4

CUT	26,595 CY
FILL	25,554 CY
NET	1,041 CY

NOTE: MAXIMUM CONSTRUCTED SLOPE SHOULD NOT EXCEED 10:1.

LEGEND

- EXISTING CONTOURS
- EXISTING SALIX SPP. DISTRIBUTION
- EXISTING WET MEADOW/SCRUB COMMUNITY
- EXISTING RUDERAL GRASSLAND COMMUNITY
- EXISTING PARCEL BOUNDARY
- PROPOSED FINISH GRADE CONTOUR
- PROPOSED SPOT GRADE
- LOW SEASONAL MARSH (ELEV 6'–7')
- HIGH SEASONAL MARSH (ELEV 7'–8')
- WET MEADOW/WILLOW SCRUB (ELEV 8'–10')
- UPLAND/GRASSLAND (ELEV 10'–12')
- PROPOSED AREA OF NO GRADING
- PROPOSED WATER QUALITY TREATMENT AREA
- PROPOSED ACCESS ROAD
- FUTURE TRAIL

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ALTERNATIVE 4

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JOB NO.: 12–007

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

FIG 4

Attachment 3

Bryant-Habert Property
Vegetation Management Plan
100% Design

March 2015

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Bryant Habert Property Vegetation Management Plan

For 100% Design

Prepared for:

Resource Conservation District of Santa Cruz County
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Capitola, California 95010
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The Land Trust of Santa Cruz County
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March 2015

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Introduction and Existing Conditions

The Bryant Habert property is located within the Watsonville Slough corridor between San Andreas Road and Highway 1. It includes 46.3 acres of historic agricultural fields that are in the process of reverting back to a mix of permanent and seasonal marsh and upland habitats. The property includes sections of Watsonville Slough and Struve Slough. Portions of the Bryant Habert property were in agricultural production or maintained for future production with annual discing until 2010, at which point the entire property was fallowed and has been managed with annual discing, mowing, habitat preservation, and invasive plant management. Several landscape features from the historical farming practices remain on the property, including the Watsonville Slough maintenance channel, the Struve Slough maintenance channel, an underground irrigation network and an agricultural production well. In 2010, a permanent floodplain easement was established on the northern part of the property and select areas within the easement south of the Watsonville Slough channel were planted with native plants.

An inventory of the plant communities on the property, associated with this vegetation management plan, was made in the fall of 2012 and is detailed in the vegetation inventory of the property and map (see Appendix A). Existing vegetation communities on the Bryant Habert property include low seasonal marsh, high seasonal marsh, ruderal wet meadow, willow scrub, and ruderal grassland habitat. The following vegetation management plan is a companion to the grading plan which is intended to enhance habitat on the property. By-in-large, grading activities are planned in a manner to retain stands of existing native plants and habitat areas or preferred non-native, non-invasive plants.

Implementation of this vegetation plan will consist of three phases:

- site preparation, including management measures to prepare the area prior to grading and planting,
- establishment, including planting activities such as seeding and transplanting and associated management measures such as irrigation, and
- monitoring, maintenance and adaptive management, including management measures such as mowing and herbicide applications.

The over-arching goal for management of the property is to restore a mosaic of functional and self-maintaining wetlands and uplands.

General goals of the project are as follows:

1. Enhance regional biodiversity and under-represented habitat units within the slough system.
2. Enhance system resilience to climatic and hydrologic change, through targeting processes and broad habitat types rather than the narrow needs of specific species.
3. Avoid the creation of additional perennial open water habitat.
4. Provide upland refugia in close proximity to wetland habitats.
5. Provide these enhancements in a self-sustaining (low maintenance) fashion.
6. Increase the viability of agriculture in the broader area.
7. Provide an aesthetic demonstration of ecologic restoration along the future Monterey Bay Sanctuary Trail.

The following is a list of objectives for vegetation management on the property.

1. Preserve existing high quality habitats and areas with desirable plant communities, including low seasonal marsh, high seasonal marsh, significant stands of willow scrub, and stands of desirable wet meadow and ruderal grassland habitat.
2. Utilize grading activities which favor low seasonal marsh, high seasonal marsh, wet meadow and mudflat to improve favorable habitat conditions and reduce the persistence of ruderal habitats dominated by invasive plants.
3. Enhance existing ruderal wet meadow and grassland habitat areas through vegetation management strategies, such as discing, and re-vegetation during the site preparation and establishment phases of the project.
4. Plan for minimal ongoing management, such as mowing and discing, during the maintenance and adaptive management phase, to both contain future maintenance costs and support wildlife and ground-nesting birds.
5. Reduce the abundance of undesirable plants, such Bristly ox tongue (*Helmenothica echoides).*
6. Establish plant communities compatible with surrounding farm operations.

The vegetation management plan contains the following sections:

I. Preservation of Existing Desirable Habitat
II. Management Measures and Constraints
III. Site Preparation Prior to Grading
IV. Vegetation Establishment
V. Maintenance, Monitoring, and Adaptive Management

The following appendices are located at the end of this document:

Appendix A. Site Maps
Appendix B. Specifications for Establishing Plant Material by Seed, Budgets
Appendix C. Specifications for Establishing Plant Material with Intensive Transplants, Budgets
Appendix D. Vegetation Establishment Recommendation Memo: 6/2013
Appendix E. Establishing Native Plants from Transplant Memo

I. Preservation of Existing Desirable Habitat

Vegetation and plant communities were surveyed and mapped in 2012 as a part of the baseline inventory for the project. Existing mudflat, seasonal wetland, low seasonal marsh, high seasonal marsh, and willow scrub habitat areas are planned to be largely preserved during grading due to the presence of locally rare and valuable habitat and native plant species (see Figures 1 and 2, Appendix A).

Mudflats

Limited mudflats are found on the property. Mudflats represent an important habitat type within the slough system, providing habitat for permanent and migratory shorebirds in fall months. Areas that support mudflats will be preserved. Grading activities are designed to increase mudflat habitat.

Low Seasonal Marsh and High Seasonal Marsh Habitat

During the existing vegetation inventory in 2012, low seasonal marsh and high seasonal marsh habitats were identified (see Figure 1, Appendix A.). These areas support predominately native plant species, constitute relatively rare and under-represented habitat types within the Watsonville Sloughs watershed and provide desirable habitat conditions for a wide range of wildlife species. In 2010 and 2011, the high seasonal marsh habitat areas supported the locally rare native plant species, bracted popcorn flower (*Plagiobothrys bracteatus*), as well as other uncommon native plant species such as golden dock (*Rumex maritima*), and water speedwell (*Veronica anagallis-aquatica*).

Areas identified as low and high seasonal marsh habitat will be undisturbed during grading activities and require no re-vegetation activity, with the exception of those areas designed to provide a surface water connection between the Watsonville Slough channel and the planned seasonal wetland depressions (See Figure 2, Appendix A and grading plan).

Willow Scrub

Willow scrub habitat is found throughout the property below the 10' elevation contour and is considered a desirable vegetation community due to its habitat value for a diversity of bird and mammal species, including songbird and raptor populations which use the property (see Figures 1 and 2, Appendix A). While relatively common in the sloughs, willow scrub habitat is decreasing in many parts of the slough system due to the decade long trend of consistently high levels of surface water in areas that historically dried annually. Emerging willow scrub habitat therefore has value in the context of watershed-wide habitat availability and associated value to wildlife.

Most areas mapped as willow scrub will be preserved. Some areas with willows less than 6-inch dbh (diameter at breast height) will be converted into other habitats through grading and re-vegetation.

Ruderal Wet Meadow and Grassland Habitat

The ruderal wet meadow and grassland habitat areas on the property contain extensive growth of non-native, invasive plant species, including bristly ox-tongue (*Helmenothica echoides*) and various other invasive thistle species. However, throughout these two habitat types, there are concentrations of native plants or non-native, *non-invasive* plants. These areas have been identified as existing desirable habitat within the ruderal grassland and wet meadow habitat (see Figure 2, Appendix A.). Native plants include marsh goldenrod *(Euthamia occidentalis*), coyote brush (*Baccharis pilularis*) and horsetail fern *(Equisetum arvensis*). Non-native plants that are considered non-invasive and naturalized within the sloughs watershed and throughout the State, include annual grasses and forbs such as Italian rye (*Festuca perrene*), annual oats (*Avena fatua*), and cut-leaf geranium (*Geranium disectum*).

Areas where wet meadow and grassland habitat is dominated by non-native invasive species will be managed to support more desirable vegetation. Areas where these habitats are dominated by non-native but non-invasive species will generally be preserved, as they are not considered a management priority. Some areas will be converted into other habitats through grading and re-vegetation. Maps to differentiate between desirable and undesirable plant communities in these habitat areas will be updated prior to implementation as described below.

Protection of Desirable Vegetation Areas

Desirable vegetation was mapped during the 2012 survey (see Figure 2, Appendix A). Prior to site preparation or grading activities, a thorough survey will be conducted by a qualified botanist or restoration ecologist to update this map and refine the areas subject to grading and/or vegetation management. This survey will update the 2012 survey as necessary to identify areas of desirable vegetation within the ruderal grassland and wet meadow habitat areas as well as the extent of low seasonal marsh, high seasonal marsh, mudflats, and seasonal wetlands, which are all considered to be desirable vegetation.

As a result of the 2012 and subsequent surveys, desirable plant communities will be avoided during site-preparation and grading work to the extent feasible. Site preparation activities may occur over several years for weed control. In that case, identification and marking of the extent of desirable vegetation will be conducted each year prior to site preparation activities and these areas will be left intact. Areas of desirable vegetation may expand to occupy areas of undesirable vegetation after they are subject to management measures. See Enhancement of Existing Stands of Desirable Vegetation below.

II. Vegetation Management Measures and Constraints

Several vegetation management measures, such as mowing and discing will be utilized at varying times during the site preparation, establishment, maintenance and adaptive management phases of this project.

The following table summarizes the methods and constraints of these practices to be described further in this plan:

Table 1. Management and Measures to Minimize Impacts.

	Management Measure							
Constraints (measures to minimize impacts)	Discing, tilling, and other cultivation	Mowing	Tractor mounted herbicide application	Manual herbicide application: spot spraying	Tractor-mounted flame torch weeding	Manual flame torch weeding	String trimming, weed-whacking, brush-cutting	Hand-pulling, grubbing
maximum occurances in an area	4/year	4/year	2/year	2/year	4/year	not limit	4/year	no limit
qualified biologist monitors area beforehand for CRLF between October 15 and August 15 and for bird nests between March 15 and August 15	yes	yes	yes	no	yes	yes	yes	no
avoidance buffer around inundated areas and saturated soils	50 feet	50 feet	50 feet	25 feet	50 feet	25 feet	25 feet	none
avoidance buffer around bird nests	50 feet	50 feet	50 feet	25 feet	50 feet	25 feet	25 feet	25 feet
other measures (see notes below)	1	2	3	3				
Notes	1	no cultivation for two weeks following a rainfall event of 0.75 inches or greater						
	2	minimum mower height of 4"						
	3	applied per label by a licensed applicator, with a marker dye as appropriate to avoid over-application						

III. Site Preparation:

Site Preparation for Invasive Weed Control Prior to Grading and Re-vegetation

Site preparation activities may be implemented each year prior to grading and re-vegetation activities. Successive site preparation activities, such as discing, mowing, herbicide application, flame torch weeding, weed whacking and hand pulling will support recruitment of native plant species on site while decreasing the seed bank of invasive plants that has built up since the field was taken out of agricultural production. This activity is expected to reduce the need for ground disturbance and weed control efforts such as mowing and herbicide after re-vegetation is undertaken. If it is not feasible to prepare the site in the years prior to grading activity, site preparation will be performed in the same year that grading activity will occur so as to provide maximum control of invasive weed species above ground and in the seed bank.

Areas of existing desirable vegetation will be managed with mowing, herbicide application, weed whacking and hand pulling to control undesirable plant species within the over-all "patch" of desirable habitat to encourage expansion of desirable species and control undesirable species. See Table 1, above, for additional details.

Areas outside of those designated as habitat to be preserved (See Preservation of Existing Desirable Habitat, above), may be subject to site preparation measures to reduce the spread and seed-set by invasive and undesirable plant species, such as bristly ox-lounge (*Helmenothica echoides*), bull thistle (*Circium vulgare*), and Italian thistle (*Carduus pycnochephala*). Target species are listed by priority in our Table 2. Invasive Plant Priorities, below, under invasive species management.

Site preparation activities will follow the minimization and avoidance measures provided in the biological opinion for this project and as shown in Table 1, Management Measures and Minimization of Impacts.

A typical set of successive discing would be conducted as follows, though modifications may be made to achieve the desired goal. During discing activity, the first pass will be with a heavy disc implement, to an approximate 6" – 8" depth, due to the high clay content in the soil. Successive management measures will be performed repeatedly to flush weed seed and limit the weed seed in the soil seed bank. The goal is to flush and exhaust to the extent possible, the weed seed bank. Due to soil moisture conditions on site, it is expected that seedlings will continue to germinate in the spring after discing activity due to soil moisture, requiring additional management measures for weed control. Irrigation may be used as needed. Discing may occur up to 4 times per year, depending on soil and site conditions, including biological constraints as outlined in Table 1.

Mowing would be a less effective, but beneficial practice to reduce the establishment and seed production of invasive plant species on site. Due to its limited impact on invasive weed seed in the seed bank, it would likely only be used if discing is not an option due to soil moisture, nesting, or other biological activity. Mowing practices will follow minimization and avoidance measures provided in Table 1. Mowing will only occur outside of the areas of desirable vegetation (Figure 2, Appendix A) so as to exclude mowing in high seasonal marsh, low seasonal marsh, and willow scrub habitat. Mowing may be conducted up to 4 times per year and would typically be required more frequently than discing due to quicker re-growth after mowing, as compared to discing.

Herbicides may be used to reduce the extent of invasive non-native plants in a manner similar to discing or mowing as described above. Broadleaf and broad spectrum post emergent herbicides, including glyphosate, may be used for this purpose. All herbicide use will be conducted by a licensed applicator in strict accordance with the label. See Table 1 for additional details.

Biological Monitoring Prior to Site Preparation

Prior to many of the site preparation activities a survey by a qualified biologist will be conducted, as described in Table 1. The biologist will survey the area for California red-legged frog between October 15 and March 15 or as determined in the Biological Opinion and for nesting birds between March 15 and August 15. Surveys will be conducted within 48 hours of the start of the site preparation activity. Locations of nests will be flagged and avoided, and provided a buffer as shown in Table 1, or treated in another manner as specified in the

minimization and avoidance measures in the biological opinion. Discovery of California red-legged frogs will be addressed as determined in the Biological Opinion.

IV. Vegetation Establishment

Vegetation establishment is intended to provide the conditions for high quality habitat development that is largely self-maintaining and self-propagating, limits the spread and persistence of invasive weeds, and requires limited annual intervention. This will be achieved through:

- preservation and enhancement of existing desirable plant communities, that will provide seed stock to the surrounding areas
- grading activities that promote desirable plant communities through altering site hydrology and the resulting recruitment of desirable plant species, and
- Establishment of robust stands of desirable plant communities through seeding and direct transplant of native plant material.

The majority of the vegetation establishment activities are planned within the existing ruderal grassland and wet meadow habitat and outside areas in which desirable vegetation communities currently exist.

In areas where regular and prolonged surface flooding is anticipated as a result of grading activities, either low intensity re-vegetation no re-vegetation is planned, due to the expected establishment of desirable plant communities from water borne seed and/or high soil saturation condition.

During the establishment phase, the proportion of the re-vegetation to be conducted by direct transplant and seeding will be determined based on financial considerations. Direct transplant at high densities is anticipated to result in greater establishment success than seeding, while seeding has historically been less costly. The actual proportions will be determined based on available resources and market prices at the time of implementation. For the purpose of budgeting, separate budgets have been prepared for seeding and transplanting.

The performance criteria for re-vegetation, described below in the Section Maintenance, Monitoring and Adaptive Management, can be met using either the direct transplant or seeding techniques incorporated into this plan. Due to the high invasive weed presence, seeding and direct transplant are both planned to be done at a high rate so as to compete with the weed seed bank. Generally, direct transplanting is likely to exceed the performance criteria to a greater extent and provide additional benefits such as greater abundance and diversity of native plant species in the resulting grassland, and so it will be preferred if it can be implemented in a cost effective manner.

Trialing of efficient agricultural equipment for transplanting is planned on the Watsonville Slough Farms property to establish large blocks of native wet meadow or grassland habitat by direct transplant as opposed to seed. If this practice is found to be successful in establishing high percent cover of native plant species, this practice would be suitable in place of seeding.

Seeding will be conducted with seed mixes that contain at minimum 90% grass species in order to increase the effectiveness of the broadleaf herbicide application (see Maintenance and Adaptive Management section below). Limited forb species (selected for their hardiness) have been included in the seed mixes (described in Appendix B), as limited quantities of native forbs will persist through broadleaf herbicide treatments. Aggressive native forb species were selected as they can compete for similar areas as undesirable broadleaf weeds, limiting the spread and establishment of invasive weeds.

The planting palates will be differentiated along surface elevations due to the strong influence of seasonal surface water and depth to groundwater on the plant community. Establishment activities with different plant palates include: limited seasonal wetland enhancement, wet meadow enhancement, and native grassland enhancement.

As described in the grading plan, grading may be conducted in multiple entries over a five year period. Vegetation establishment will generally follow grading activity and may be conducted up to 2 years after grading to allow for sufficient site preparation, though most grading and re-vegetation will occur in the same year as to minimize disturbance to wildlife utilizing seasonal wetland habitat in the graded portion of the site. Monitoring and maintenance of the vegetation will occur for at least two years following planting, and potentially for longer as described below in the Section Maintenance, Monitoring and Adaptive Management.

Establishment may also be conducted on areas that are not graded to shift the plant community to a more desirable condition.

Enhancement of Existing Stands of Desirable Vegetation

As described in Section I, Preservation of Existing Desirable Habitat, desirable vegetation will be flagged and avoided during site preparation work. No re-vegetation is planned for these areas, however, these areas will be managed to remove priority invasive plant species (see Table 2 below) to facilitate the further development of the desirable plant community and native habitat.

Marking the Site after Grading

Land surface elevations will be determined following grading activities to ensure selection of the appropriate planting palate and guide planting.

As described in the grading plan and above in this plan, grading activities will be field fit to avoid high value existing habitat and site conditions at the time of construction. The extent of the final grade at different elevations and inundation regimes may vary as a result. Acreages listed below are likely to vary somewhat as a result.

Seedbed Cultivation

Prior to planting seeds or transplants, the site will typically be disced to reduce compaction and provide a proper seed bed for germination. Additional soil preparation activity is expected to include shallow ripping, chiseling, and ring rolling to provide proper soil structure and surface consolidation. Additional cultivation may be utilized prior to seeding or transplanting with other implements such as flex-tine cultivators and finger-tine cultivators. In areas where transplanting of container stock will occur, site preparation of greater intensity during the final cultivation prior to planting will likely be required to facilitate use of mechanical transplant equipment depending on site conditions.

Due to the high water table and difficulty of accessing the site once rains begin, site preparation will occur outside the rainy season to the extent practical.

Seasonal Marsh Enhancement

Seasonal marsh enhancement will be conducted in approximately 0.2 acres between 7 and 8 feet elevation (NAVD88) and 1.4 acres between 8 and 9 feet in elevation in areas which have been graded to lower the surface elevation as described in the grading plan. Most of the areas graded to between 7 and 8 feet in elevation are likely to receive surface floodwaters from the main slough channel, and it is expected that water borne native plant seed will establish in those areas without planting, as has been seen in other similar areas on the property in the time since the agricultural field has been out of production. Those areas that surface waters are unlikely to reach will be re-vegetated with native plant material. A plant material list is found in Appendices B and C.

Wet Meadow Enhancement

Wet meadow enhancement is planned for 8 acres within the 8 to 11 foot elevation range and is intended to provide high quality native wet meadow habitat within the existing ruderal wet meadows on site. Many of these areas will be subject to grading. Wet meadow enhancement work will include seeding and/or transplanting with site appropriate native plant material throughout the enhancement area. Detailed information on species quantities for container stock and seeding and seeding rates are found in Appendices B and C. Seed which requires cold stratification for improved germination will be stratified prior to installation. Quickly colonizing plant species were selected for the majority of the wet meadow enhancement area.

Native Grassland Enhancement

Native grassland restoration is planned for 1.3 acres within the 10 to 12 foot elevation range and is located primarily within areas which are currently ruderal grassland habitat, and which will be disturbed by grading activities. Native grassland enhancement work will include seeding and/or transplanting with site appropriate native seed stock throughout the enhancement area. Detailed

information on species quantities are found in Appendices B and C. Seed which requires cold stratification for improved germination will be stratified prior to installation.

Seed and Container Stock Installation

In areas receiving container stock, native seed will be broadcast seeded or drill seeded into well-tilled soil. After seeding, if the seed is broadcast, the site will be ring rolled and lightly compacted again as to provide good seed to soil contact.

Container stock may be established with either rain or irrigation. If established with rain, container stock will be planted directly into the tilled soil after the first rains but before significant rains make the site inaccessible. As the site is relatively flat and there is limited erosion potential, container stock installation will be conducted after rains or irrigation have established moisture to the depth of the root zone. If feasible, container stock will be planted once grading activity has ended, directly into the tilled soil and irrigated. In the case of container stock installation, the site may be seeded with native seed concurrent with transplanting in order to support greater establishment of desired species.

Container stock will be transplanted either by hand or with mechanized transplanting equipment. For use with agricultural transplant equipment, maximum container size is anticipated to be 2" x 2" x 2 ½".

Irrigation

An irrigation contingency plan will be in place for establishment plantings. In areas where seeding has been utilized, it is expected that with a normal rainfall year, rain will provide sufficient soil moisture for successful establishment of plant material. Irrigation is anticipated to be required for areas in which transplanting will be utilized due to the sensitivity of young transplants or under drought conditions. If large scale irrigation is needed, the irrigation infrastructure on the property will be upgraded to accommodate the pressure needs or a suitable alternative will be identified.

An irrigation contingency plan will be in place for maintaining any container plantings. Sufficient rain prior to planting would be indicated by soil moisture at the depth of the root ball of the plant to be planted. Sufficient rain after planting would be indicated by sufficient soil moisture at the root zone so as not to stress the installed plant. Irrigation of container stock may be conducted with sprinklers and/or drip irrigation by pumping groundwater from the well on site or that of a neighboring farm. A water truck may be used.

Plant Material for Seed and Container Installation

All plant material will be collected from parent material within the Pajaro River watershed or Monterey Bay bioregion to the maximum extent possible, as locally-sourced plant material will be most adapted to on-site conditions in the short-term and provide the conditions for long-term resiliency.

While most seed is planned to be sown at pure live seed rates, some seed collected from wild populations is planned to be sowed at bulk rates, as determining pure live seed rates would be impractical. These specifications are provided in the seeding lists found in Appendixes B and C. The large majority of species that have been selected for seeding and container stock were selected for their phenological abilities to self-propagate and spread aggressively by either seed or rhizome, in order to compete with the high presence of undesirable species on site.

Due to the complexity of production and collection of this material, the relative quantities of seeded and planted species may be adjusted at the time of project implementation.

V. Maintenance, Monitoring and Adaptive Management

Maintenance of areas that have been seeded or planted with container stock

Maintenance activities after seeding or planting are required to ensure the successful establishment of plant material. The maintenance period for this project is anticipated to be two years after installation. It will be extended if the performance measures are not met. During the first year of seeding, the primary goal is to establish native grass and mono-cotyledon species. Use of a broadleaf specific herbicide is planned to remove invasive forb species and establish native grass cover, if necessary. Small quantities of forb species have been included in the seeding mix; however, these may or may not persist due to maintenance practices which target broadleaf weeds. Maintenance practices may include mowing, herbicide application, flame torch weeding, string trimming/weed whacking and hand-weeding.

Maintenance methods will follow practice descriptions as described in the Management Measures and Constraints Table, in Section II Management Measures and Constraints. All practices will occur outside of areas with surface water inundation and outside of areas with saturated soils in order to avoid impacts to sensitive wildlife. A 50 foot buffer will be provided to all areas with surface water inundation with most management measures (see Table 1 for more details).

Flame-torch Weeding: Flame torch weeding can eliminate dicot species (forbs) while preserving monocot species (grasses) due to the relative position and growth of meristem tissue. Depending on the weather and access to the site, a tractor mounted flame torch weeder or hand torch may be used after early rains for control of broadleaf weeds, such as bristly ox-tongue (*Helmenothica echoides*) and bull thistle (*Circium vulgare*).

Herbicide Application: Use of a broadleaf herbicide in conjunction with native grass seeding has been shown to effectively establish high percent cover of native grass species and effectively control undesirable broadleaf weeds. Herbicides may be used for up to two years following planting, with exceptions determined by the adaptive management process described below in this section.

All herbicides would be applied in strict accordance with the label. Herbicides used at the site would typically include selective post-emergent herbicides that control broadleaf weeds at a variety of plant growth stages and are approved for use near or over water bodies (though herbicide applications would not occur over water at any time during the project). Broadleaf herbicides are used to control woody and herbaceous broadleaf plants but are ineffective on grasses. Broad spectrum post-emergent herbicides may also be used.

It is anticipated that one treatment per year for the first two years would be sufficient to accomplish the project goals. However additional applications may be used, though no greater than two applications will be made per year. The application would typically be accomplished using boom spray equipment attached to an ATV or wheeled tractor. Spot-treatments with a hand-wand attached to an ATV or backpack sprayer may be applied in lieu of broadcast treatments if broadleaf plants are not overly competitive or ubiquitous. Spot-treatments would typically utilize a marker dye to reduce the likelihood of repeat applications.

Mowing: As most of the plant species planned for planting are perennial, mowing will promote root development over vegetative growth, favoring perennial plants not reliant on annual seed set and reducing mowing needs in subsequent years. Some non-native plants are considered compatible with the goals of the re-vegetation effort, including non-native annual grasses and non-invasive, non-native forb species. Mowing would typically be conducted with a tractor mounted mower set 4 to 8 inches above the ground, and would typically be limited to two mowing treatments per year. Weed whacking would be used in lieu of mowing when treatment areas are small in size or inaccessible by mowing equipment, and would also typically be limited to two treatments per year. As described in the Management Measures and Constraints Table, work would be conducted outside of the nesting season or in areas determined to be clear of nesting birds, to prevent impacts to wildlife.

Prioritization of Invasive Species for Management

Invasive plant species have been divided into high priority and moderate priority species. High priority species, such as jubata grass or acacia, will be removed regularly as they would have a detrimental effect on the habitat and would colonize substantial acreage on the site quickly. Moderate priority species are those which either currently exist on the site or are known to exist in relatively close proximity and can have a detrimental impact to re-vegetation efforts, habitat quality, or surrounding land uses such as agriculture or conservation. Moderate priority species are those that are not known to colonize and out-compete native plants to the same degree as high priority species. For those species currently not on site, it would be of significant cost savings in maintenance effort and have significant impact on habitat establishment and quality to remove small to moderate populations as they appear on site and prior to their establishment and

seed set. Each species with a moderate ranking will be evaluated for control over time; ranking and new priority species will be evaluated in coordination with surrounding land managers and growers in the region, and the California Invasive plant council published lists (http://www.cal-ipc.org/paf/). The following is a list of high and moderate priority invasive plant species of concern for this site. These lists may be adjusted over time and the understanding of the site and region develops.

Table 2. Invasive Plant Species Priority Ranking

High Priority		**Moderate Priority**	
Acacia*	*Acacia dealbata*	Bristly Ox-tongue*	*Picris echoides*
Big Perriwinkle	*Vinca major*	Bull Thistle*	*Circium vulgare*
Cala Lilly	*Zantedseschia aethiopica*	Italian Thistle*	*Carduus pycnocephalus*
Cape Ivy	*Delairea odorata*	Poison Hemlock	*Conium maculatum*
English Ivy	*Hedera helix*	Purple Star Thistle	*Centauria calcetrapa*
Eucalyptus	*Eucalptus globulus*		
French Broom	*Genista monspenssulana*		
Fullers Teasel	*Dipsacus sativus*		
Giant Reed	*Arundo donax*		
Himalaya berry	*Rubis discolor*		
Jubata and Pampas Grass*	*Cortaderia Jubata/Cortaderia selloana*		
Parrotfeather	*Myriophylum aquaticum*		
Perrenial pepperweed	*Lepidium latifolium*		
Purple Loosestrife	*Lythrum salicaria*		
Sticky Eupatorium	*Ageratina adenophora*		
Stinkwort	*Detricia graviolens*		
Tocolote, Malta Star Thistle	*Centauria melitensis*		
Water Buttercup	*Ranunculus repens*		
Water hyacinth	*Echhiornia crassipus*		
Yellow Star Thistle	*Centauria solstitialis*		

* Species currently present on site

Monitoring Requirements and Adaptive Management

Adaptive management will be utilized to support successful implementation to meet project goals. Performance metrics will be utilized as a basis for monitoring, evaluation, and determination of subsequent maintenance actions during the monitoring period. The establishment period for this project is anticipated to be two years. In subsequent years, monitoring and management activities may be conducted as necessary to sustain the goals of the project.

A flow chart of the Adaptive Management process decision tree is shown in Figures 2, 3, and 4 below.

Performance metrics have been identified for each of the major habitat groups on the project site and will be monitored throughout the areas within the limit of disturbance. Vegetation sampling will be utilized two years after project implementation as a means to assess project performance for each habitat type and support adaptive management measures. Performance metrics were developed as a means to identify vegetative cover post restoration work that reflects the project goals and objectives.

Table 3. Summary of Performance Metrics

	Performance Metrics			
Habitat Type	**Bare ground**	**Invasive plants**	**Total Native Cover for Habitat Type (equal to or greater than)**	**Total Native Species Richness**
Low seasonal marsh	n/a	high priority = <5%, moderate prority = <20%	30%	1 or greater per graded depression
High seasonal marsh	n/a	high priority = <5%, moderate prority = <20%	25%	1 or greater per graded depression
Wet meadow and willow scrub	<25%	high priority = <5%, moderate prority = <20%	25%	5
Grassland	<25%	high priority = <5%, moderate prority = <20%	15%	4

Monitoring Methodology

Vegetative sampling methodologies for this project were developed with methodologies supported by the United States Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, and the Nature Conservancy (Elizinga, Salzer, Willoughby, Gibbs, 2001) and also reflect effective practices identified by Watsonville Wetlands Watch over many years of vegetative monitoring in the Watsonville Slough System.

Vegetation monitoring will be conducted within habitat types using distinct sampling methodologies for seasonal marshes and wet meadow/grassland areas. The varying sampling methodologies were selected due to the varying typical growth and composition within seasonal wetlands, as compared to wet meadow and grassland areas on this project site, as described within the sampling methodology section for each habitat type below.

Seasonal Marsh Habitat: Seasonal marshes will be sampled for vegetative cover using a stratified systematic sampling methodology where the starting point for regular placement is selected randomly along a permanent baseline at each seasonal depression. Vegetative cover will be recorded by species using modified Braun-Blanquet cover classes (1=0-5%, 2=5-10%, 3=10-25%, 4=25-50%, 5=50-75%, 6=75-90%, 7=90-100%) within quadrats placed at each meter along the transect line. Transect lines will serve as the sampling unit for development of total

percent cover by species and total native and non-native cover, including bare ground. A minimum of three transects will be monitored within each seasonal wetland. Monitoring for native species richness will include a survey of all plants within each seasonal wetland.

Wet Meadow and Grassland Habitat: Wet meadow and grassland habitats will be sampled for vegetative cover with the point intercept method, using a stratified systematic sampling methodology where the starting points for regular placement is selected randomly along fixed transects. Locations of fixed transect will be generated at the onset of monitoring through a random selection process along a permanent baseline (see figure 1. below). Vegetative cover will be monitored using the point intercept methodology, in which all plants that come in contact with a pin flag dropped at each monitoring point along the transect are recorded. Monitoring points will be utilized as the sampling unit for the purpose of developing percent cover for individual species and total native, non-native cover, and bare ground measurements. Due to the high proportion of grasses and other narrow leafed plant species and the presumed high diversity of plant species within a small area in the wet meadow and grassland habitat areas, the point intercept method is felt to be less biased and more consistent between monitoring persons than a quadrat sampling methodology. It is also felt that point intercept sampling can be performed much quicker than quadrat sampling on this site, due to the high diversity of plant species and grasses in particular, and therefore a much higher number of samples can be taken, increasing the power of the sampling analysis. While point intercept monitoring typically records the canopy cover only, it will be utilized here as a proxy for plant community composition, as all plants in contact with the pin flag will be recorded.

Total species richness and native species richness will be recorded in a 1 meter belt transect along each monitoring transect. A minimum of 50 points will be recorded along each transect at 1 meter intervals with in the wet meadow habitat areas and a minimum of 40 points will be recorded along each transect at 1 meter intervals within the grassland habitat area. A minimum of 5 transects will be recorded with in the grassland areas and a minimum of 8 transects will be recorded in the wet meadow habitat area due to the relative size of each habitat area. Additional transects will be utilized if the performance metric cannot be met with at least a 90% confidence interval.

A final monitoring report will be prepared once all performance monitoring metrics have been reached.

Figure 1. Location of Fixed Monitoring Baselines

Habitat Type Performance Metrics

Native Cover and Native Species Richness: Seasonal Marsh, Wet Meadow and Willow Scrub Habitat, Grassland Habitat

Native vegetative cover and native species richness is important to support high quality habitat that sustains the desired conditions within each restored vegetative community over time. Established native cover will reduce invasive plant species growth and persistence and support wildlife habitat.

Performance Metric

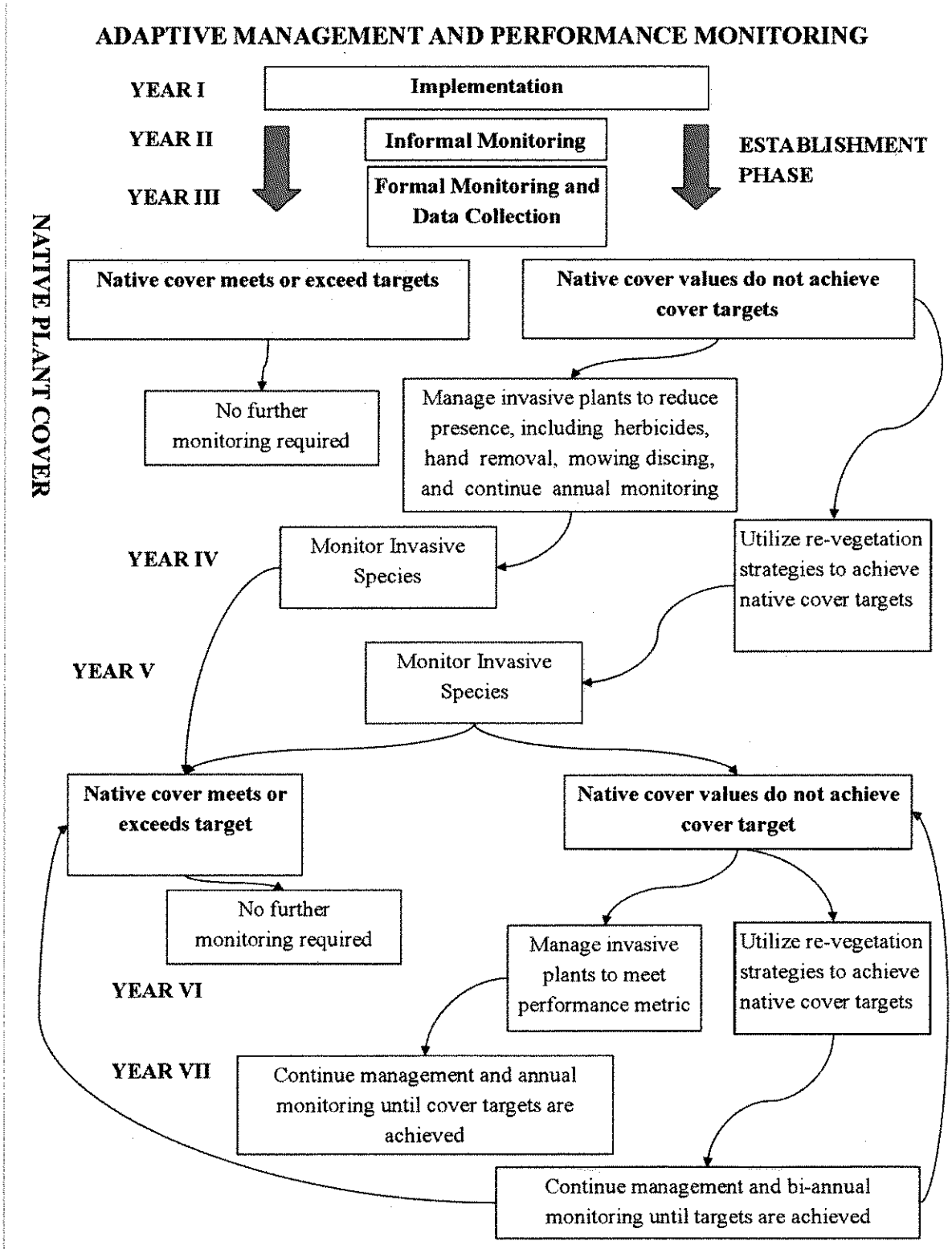
After 2 years, total native cover and native species richness will be equal to or greater than the cover and richness values in Table. 3 Summary of Performance Metrics found on the preceding pages.

Maintenance and Adaptive Management

If the performance metric is not met two years after restoration, additional maintenance and adaptive measures should be utilized. These might include increased invasive plant control measures, such as hand weeding, flame torch weeding, or herbicide application, scraping of the soil surface to promote growth of new plant species or additional installation of native seed or container stock. If invasive plant removal or other vegetation management methods are utilized, monitoring can be conducted each year after the performance metric is complete until the performance metric is met. If maintenance actions include re-vegetation, additional performance monitoring should follow 2 years after installation of native seed or container stock for the habitat area in which this practice was utilized. If the performance metric is not achieved after monitoring and there is concern that ongoing intensive maintenance will be required to achieve the metric that will have significant impacts on listed or sensitive wildlife species, the property owner may elect to consult with applicable agencies, such as U.S. Fish and Wildlife Service, the Resource Conservation District of Santa Cruz County, and Santa Cruz County to determine an alternative performance metric for a given habitat area.

Once the performance metric is achieved monitoring may be terminated and no further actions may be taken. Additional vegetation management may be conducted, at the discretion of the owner, to enhance the habitat above and beyond this performance metric provided that such actions are consistent with the measures to minimize impacts shown in Table 1.

Figure 2. Adaptive Management and Performance Monitoring for Native Cover Performance Metric



Non-Habitat Type Specific Performance Metrics

Bare Ground

Bare ground can provide a place for invasive weed seed to establish and is an indicator of failure of seed or container stock to establish or lack of recruitment. Measurement of bare ground will occur outside of seasonal marshes (i.e. in areas above 8' in elevation), as development of mudflats within seasonal marshes are desirable.

Performance Metric

After 2 years, bare ground within the limit of disturbance will not exceed 25%, in each of the vegetative communities, excluding areas of mudflats and seasonal marsh.

If the bare ground is less than 40% but greater than 25% and plant establishment appears to be on trajectory to meet the performance metric in the third year after planting, adaptive management actions may be delayed for a year, with monitoring repeated after that time. Otherwise adaptive management actions will be taken as described below.

If bare ground exceeds 40% two years after planting then adaptive management actions will be taken.

If this performance metric is met, monitoring for this criterion will be discontinued. If this performance metric is not met, adaptive management actions will be taken, and monitoring will be conducted again after a 2 year interval. This process will continue until the performance metric is met.

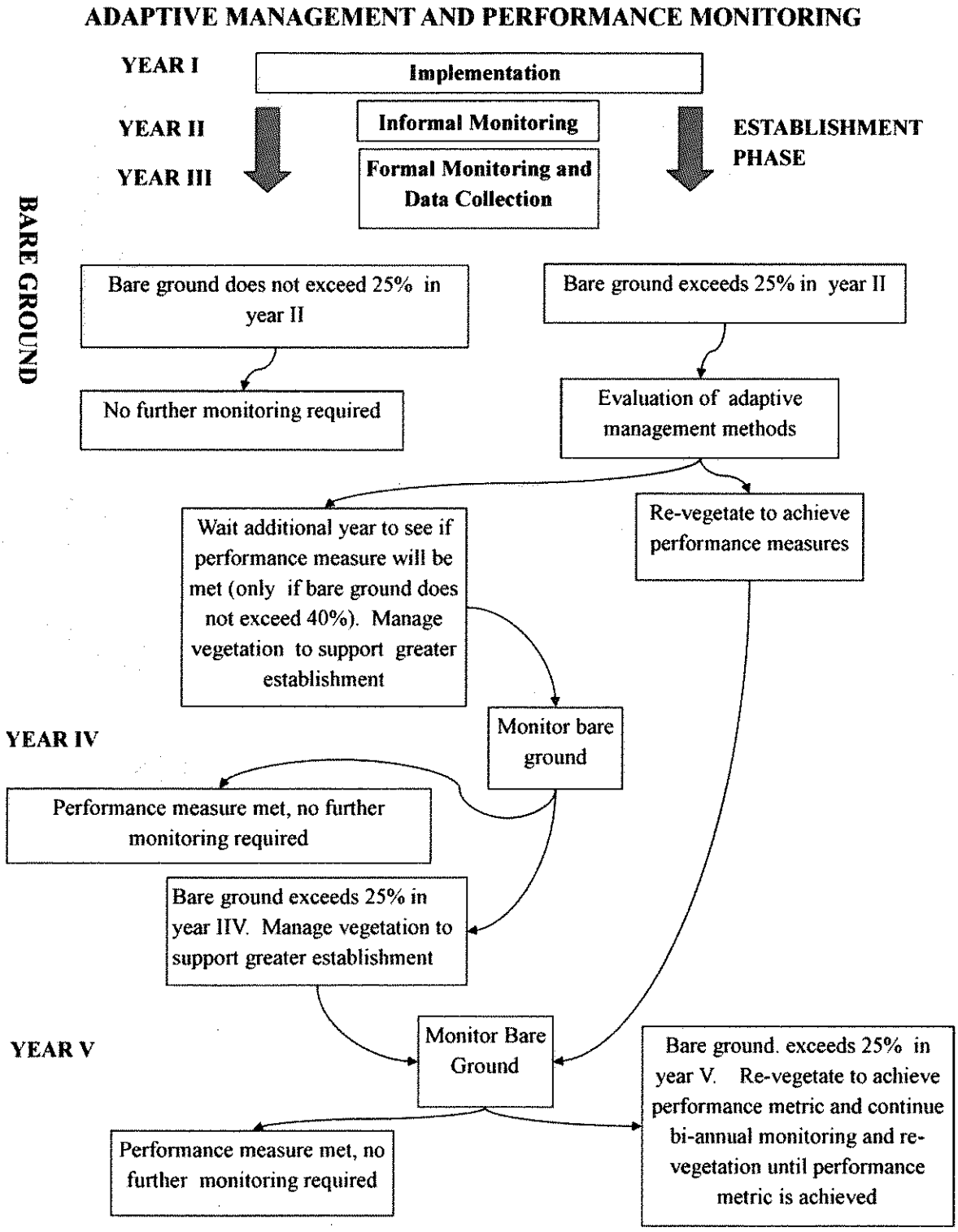
Adaptive Management and Maintenance Actions

Factors most likely to contribute to persistent bare ground include insufficient rainfall to support germination and growth of plant species or use of improper seeding or planting technique. Herbivory of seeded plant species can be a factor adjacent to wetlands, but is not expected due to the current low presence of duck and rabbit species within the areas of seeding.

Those areas that exceed the criteria for bare ground will require corrective actions until the performance metric is achieved. These may include additional installation of plant material, additional irrigation, or other management measures to promote plant establishment as identified in Table 1. Management Measures and Measures to Minimize Impacts and Constraints.

Additional installation of plant material will be conducted as needed in areas where the bare ground threshold is not met. Additional planting will most likely be required in areas which appear to be vulnerable to colonization by invasive weeds or with persistent bare ground. Such areas will be re-vegetated utilizing the methods described in this plan as appropriate. If re-vegetation is required, the species mix may be modified to exclude any species which were not successful.

Figure 2. Adaptive Management and Performance Monitoring for Bare Ground Performance Metric



Invasive Plant Species Establishment

Invasive species can limit the establishment of beneficial habitat and present a problem for neighboring agricultural lands and habitat.

Performance Metric and Monitoring

Monitoring will be conducted after two years. Monitoring for this performance metric will utilize both the vegetative sampling methodologies as described for marsh, wet meadow, and grassland habitat areas as well as gps mapping when invasive plants are located as individuals or patches. If invasive plants are located in distinct clumps or patches, invasive plant distribution and acreage will be collected with a hand-held gps recorder and evaluated within a GIS map.

Performance Metric

After 2 years, the extent of high priority invasive plant species (Table 2) does not exceed 5% of the vegetative cover and/or moderate priority invasive plant species does not exceed 20% of the vegetative cover within the limit of grading disturbance.

If the performance metric is achieved, monitoring may be terminated and no further actions may be taken. Additional vegetation management may be conducted, at the discretion of the owner, to enhance the habitat above and beyond this performance metric provided that such actions are consistent with the measures to minimize impacts shown in Table 1.

If the performance metric is not achieved, the Adaptive Management and Maintenance Actions described below will be conducted, and monitoring will be repeated after another two year period in Year 5.

If the performance metric is achieved in Year 5, then monitoring may be terminated and no further actions may be taken. Additional vegetation management may be conducted, at the discretion of the owner, to enhance the habitat above and beyond this performance metric provided that such actions are consistent with the measures to minimize impacts shown in Table 1.

If in Year 5 the performance metric is not achieved, a site assessment will be conducted to identify the factors contributing to the lack of success and develop new approaches. Timing of mechanical and chemical control may be evaluated, as this can be a critical factor in efficacy of maintenance practices.

Additional management actions will be identified and, another round of management actions will be taken. Monitoring will be repeated after another two year period, in Year 7, to test whether the performance metric is achieved. The actions in response to the results will follow the process outlined for Year 5 above.

This site assessment may alternatively determine that no further action is acceptable within the project goals. For example, if moderate priority species are proliferating within the interior of

the property, control efforts may cause more damage to habitat or water quality than the impacts of the invasive plants on habitat or surrounding land uses. Similarly, if the presence of invasive species is not impairing habitat or the recruitment or establishment of desirable vegetation, no further action may be warranted.

If the site assessment leads to the conclusion that no further action is necessary to achieve project goals, no further management actions will be taken. The assessment will develop additional monitoring criteria to verify the project goals are being met. Monitoring will be repeated after another two year period, in Year 7, based on both the original monitoring protocol and these additional criteria. If this monitoring determines that the goals are being met, then no further monitoring will be conducted. If this monitoring determines that the goals are not being met, management actions will be taken consistent with Table 1 and/or a new site assessment will be conducted following the process described for Year 5 above.

Adaptive Management and Maintenance Actions

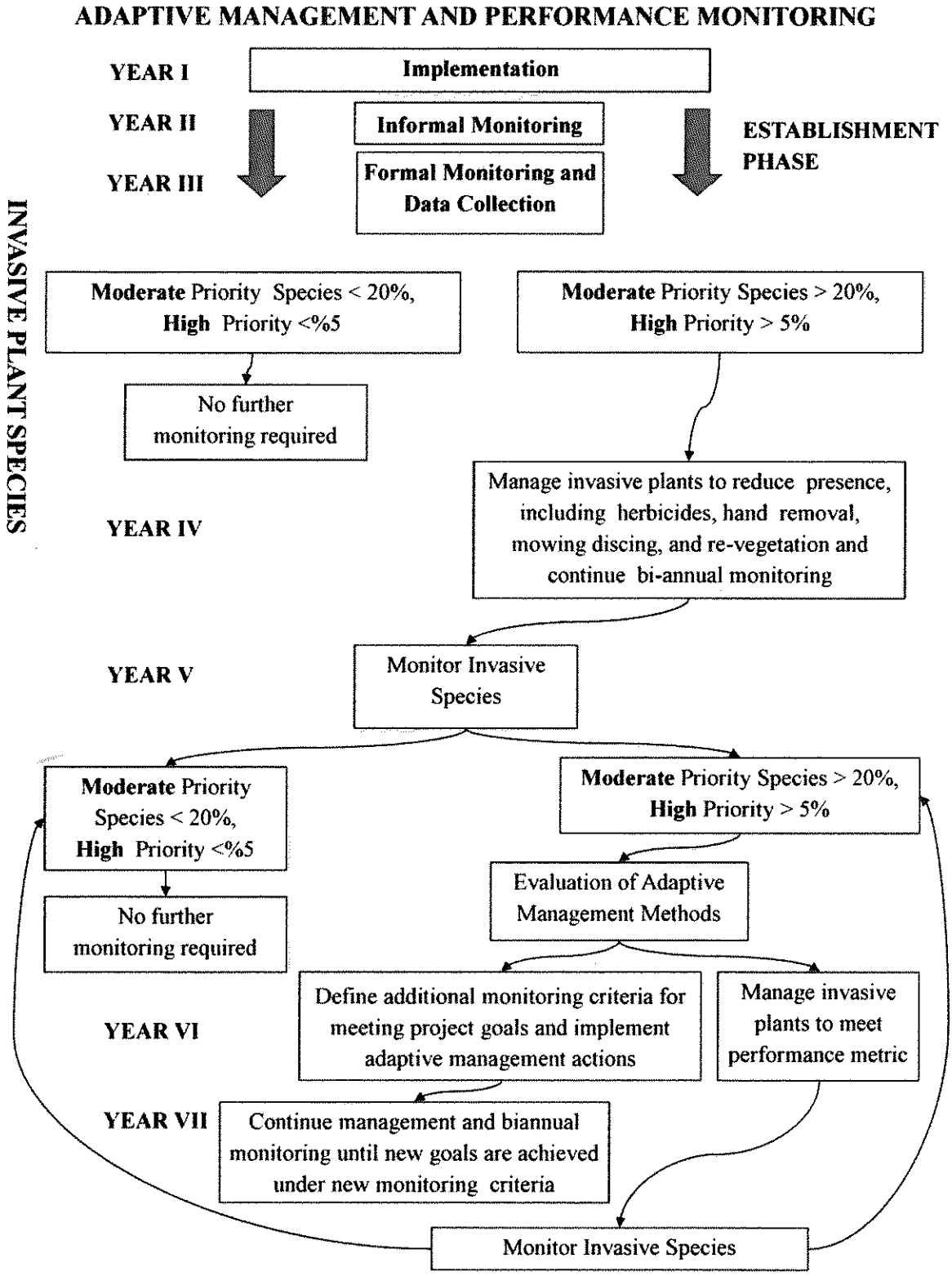
Factors most likely to contribute to high percent cover of invasive plants species include insufficient germination or growth of seeded plant species due to problems associated with installation efforts, inadequate site preparation, inadequate maintenance during the establishment period, including timing of herbicide use, or the competitive advantage of the invasive species.

Areas that exceed the percent cover metric for high and moderate priority invasive plant species will be treated to reduce the invasive plant species present.

While there are a variety of effective methods for control and on-site eradication of invasive plant species, the primary methods for removal include hand grubbing, mechanical such as scraping or discing (areas within constrained area), mowing and herbicide application. Maintenance actions that include intensive soil disturbance such as scrapping or discing will be accompanied by re-vegetation efforts such as seeding or transplanting. Proportions of species within the seed mixes and container stock lists in Appendix B and C will be determined based on site conditions, but will emphasize those species that have shown to be successful. For each invasive plant species the most effective and efficient means of control will be utilized in a manner that takes into consideration the phenology of the plant species, likelihood of spread, impact on habitat, impact of the control efforts on wildlife, water quality and habitat, and the impact of the particular invasive plant on surrounding land uses.

All management actions will be conducted in a manner consistent with Table 1. Management Measures and Measures to Minimize Impacts.

Figure 3. Adaptive Management and Performance Monitoring for Invasive Plant Species Performance Metric



Maintenance Beyond the Vegetation Establishment Period

As a typical practice, a minimum 30 foot buffer from any areas adjacent to neighboring farmland may be mowed periodically if there are invasive seed borne plants, such as non-native thistle species. A mowed buffer will alleviate concerns on the part of surrounding landowners and growers related to food safety, fuel load, and the spread of weedy plant species. Mowing may also occur around all irrigation or other property infrastructure such as easement markers, environmental monitoring devices, and the pump house in order to maintain these features.

Beyond the establishment period, vegetation maintenance will focus on the long-term viability of native habitats with actions that support the growth habit of desirable vegetation and control priority invasive plant species. Mowing native plants with a tolerance for this will aid in the long-term viability of native plant populations, as this can reduce non-native and invasive plant cover as well as invigorate the growth of the native plants. The approach to avoid impacts to sensitive species by mowing is outlined above in Table 1. Management Measures and Measures to Minimize Impacts.

If native plant cover is established to the exclusion of undesirable broadleaf weeds, mowing may be conducted within 5 to 10 acres every 2 -4 years for the purpose of invigorating native grass species and reducing the likelihood of invasion by aggressive invasive forb species. The mower would be set no lower than 4" in order to retain a thatch layer, important for exclusion of invasive broadleaf weeds, as well as for the benefit of wildlife species. Spot treatment of invasive plants may also be conducted using broadleaf or broad spectrum herbicides following the protocols described above. Generally, invasive plants will be managed with an emphasis on priority and resources available, with the purpose of supporting the project goals over time. Additional vegetation management measures such as selective mowing or removal of invasive plants through other means such as weed whacking, herbicide, and hand pulling will be utilized to reduce establishment and persistence of undesirable plant species on the property. Long-term maintenance work will follow the guidelines listed in Table 1. Management and Measures to Minimize Impacts.

Table 4. Implementation and Operations Schedule for Establishing Plant Material from Transplant and Seed

Implementation and Establishment Period Operations Schedule - Establishing Plant Material with Seed													
	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Monitoring and Adaptive Management As Needed
Site Preparation													
Disc site 1-3x													
Ring roll/cutipack site													
Field cultivator/tined cultivator													
Implementation													
Broadcast/drill seed													
Ring roll/cultipack site													
Maintenance													
Mow 2 x 3 times													
Herbicide application 1 x 2 times													
Hand Removal of Invasive Weeds													
Mechanical weed control (non-tractor mounted)													
Monitoring													
Peformance monitoring													

Implementation and Establishment Period Operations Schedule - Establishing Plant Material with Transplants													
Vegetation Management, Maintenance, and Monitoring	**Year I**				**Year II**				**Year III**				**Year IV**
	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Monitoring and Adaptive Management As Needed
Site Prepration													
Disc site 1 -3x													
Chisell plow													
Ring roll/cultipack site 2x													
Field cultivator/tined cultivator													
Installation													
Sow native seed													
Transplant plugs													
Irrigation													
Maintenance													
Mow 1 x 3 times													
Herbicide application 1 x 2 times													
Hand Removal of Invasive Weeds													
Mechanical weed control (non-tractor mounted)													
Monitoring													
Peformance monitoring													

Appendix A. Site Maps

Figure 1.

Existing Vegetation Types, Bryant Habert Property
Watsonville Slough Farm, Land Trust of Santa Cruz County

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Vegetation Management Measures
Bryant Habert Property

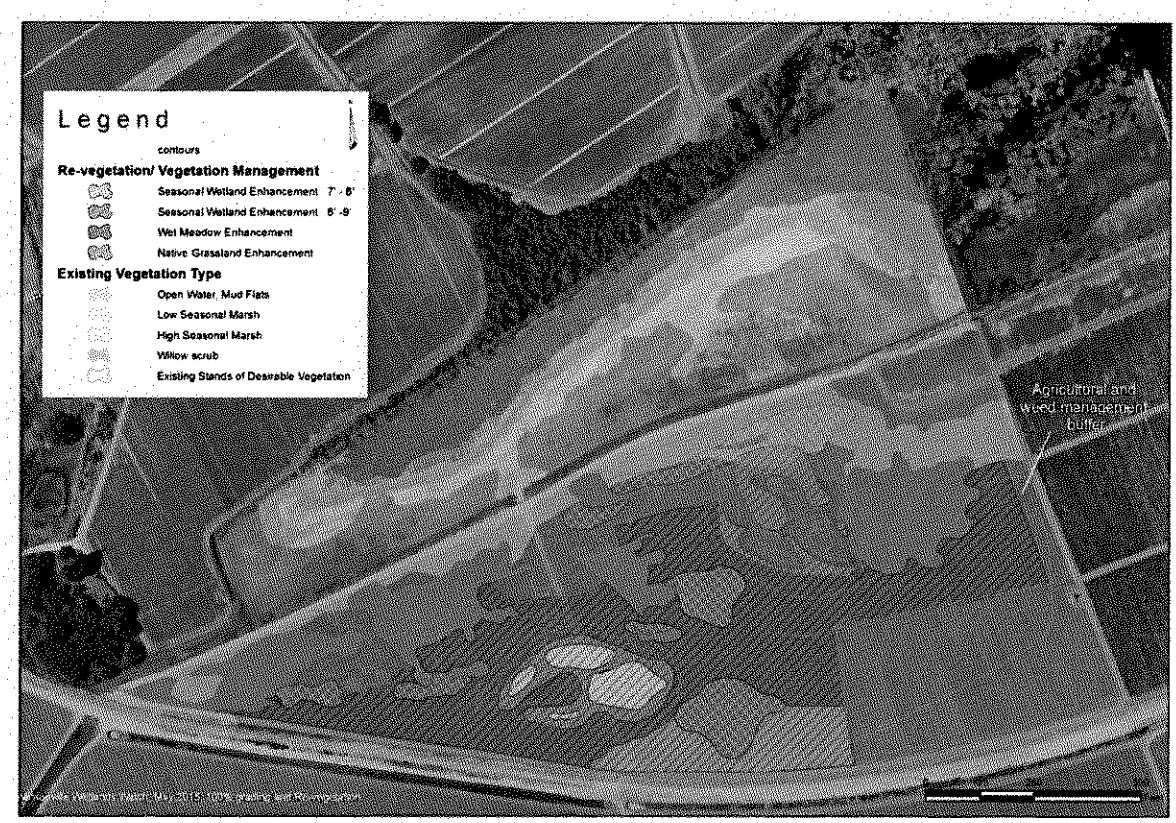

Figure 2.

Appendix B. Specifications for Establishing Plant Material by Seed

Seeding Quantities:

Seasonal Wetland Enhancement I Seeding Quantities, Establishing Plant Material by Seed			
7' - 8' elevation range			
Species	Common Name	Sowing Rate (PLS): Lbs./Acre	Total Quantity Pure Live Seed (Lbs.)
Bidens laevis	Marsh marigold	5.0	1.0
Helenium puberium	Sneezeweed	5.0	1.0
Mimulus guttatus	Seep monkey flower	2.0	0.4
Scirpus robustus	Prairie bulrush	5.0	1.0
Total		17.0	3.4

Seasonal Wetland Enhancement II, Establishing Plant Material by Seed			
8' - 9' Elevation range			
Species	Common Name	Sowing Rate (PLS): Lbs./Acre	Total Quantity Pure Live Seed (Lbs.)
Epilobium densiflorum	Dense flowered boidsvaldia	1.0	1.4
Helenium puberium	Sneezeweed	3.0	4.2
Hordeum bracyantherum	Meadow barley	6.0	8.4
Juncus effusis	Bog rush	1.5	2.1
Juncus patens	Spreading rush	1.0	1.4
Scirpus robustus	Prairie bulrush	2.0	2.8
Total		14.5	20.3

Native Grassland Enhancement Seed Quantities, Establishing Plant Material by Seed			
Species		Sowing Rate (PLS): Lbs./Acre	Total Quantity Pure Live Seed (Lbs.)
Achillea mellifolium	Yarrow	0.3	0.4
Bromus carinatus	California Brome	4.4	5.7
Elymus glaucus	Blue wildrye	5.8	7.5
Festuca microstachys	Small fescue	1.7	2.2
Horkelia cuneata	Wavy-leafed horkelia	0.2	0.2
Hordeum bracyantherum	Meadow barley	1.7	2.2
Nassella pulchra	Purple needle grass	8.6	11.2
Sisyrinchium bellum	Blue eyed grass	1.5	1.9
Total		24.1	31.3

Wet Meadow Enhancement Seed Quantities, Establishing Plant Material by Seed			
Species		Sowing Rate (PLS): Lbs./Acre	Total Quantity Pure Live Seed (Lbs.)
Grasses and other Monocots			
Bulboschoenus robustus	Prairie Bulrush	0.2	1.5
Carex barbarae	Santa Barbara Sedge	0.2	1.4
Carex densa	Dense Sedge	0.4	2.8
Cyperus eragrostis	Nut Sedge	1.0	8.0
Danthonia californica	California oat grass	1.2	4.0
Echinochloa crus-galli	Barnyard Grass	1.1	8.5
Elymus glaucus	Blue wild rye	3.2	25.3
Hordeum bracyantherum	Meadow barley	12.1	96.4
Juncus effusis	Bog rush	0.1	0.8
Juncus patens	Spreading rush	0.1	0.8
Paspalum distichum	Ditchgrass	1.0	8.1
Subtotal		20.6	163.4
Forbs			
Achillea millefolium	Yarrow	0.0	0.3
Artemesia douglasiana	Mugwort	0.1	1.1
Baccharis douglausii	Marsh Baccharis	0.1	0.5
Epilobium densiflorum	Dense flowered boidsvaldia	0.2	1.5
Euthamia occidentalis	Marsh goldenrod	0.1	1.2
Helenium puberium	Sneezeweed	0.0	0.3
Oenothera hookerii	Evening primrose	0.1	0.6
Subtotal		0.7	5.6
Total		21.3	169.0

Budget Summary:

Establishing Plant Material by Seed	
Site Preparation for Invasive Weed Control Prior to Grading and Excavation	$15,000
Vegetation Establishment	$25,522
Maintenance	$29,250
Biological Monitoring	$4,800
Subtotal	$74,572
Contingency (5%)	$3,729
Total	$78,300

Establishing Plant Material by Seed	
Cost Estimate By Year	
Year I	$10,740
Year II	$32,182
Year III	$15,825
Year IV	$15,825
Subtotal	$74,572
Contingency (5%)	$3,729
Total	$78,300

Budget Detail:

Establishing Plant Material By Seed

Site Preparation for Invasive Weed Control Prior to Grading and Excavation (Year I,II)							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Site Preparation	Survey site for desirable vegetatio	14	$50	$700	$0	$0	$700
	Generate map	4	$50	$200	$0	$0	$200
	Mowing to facilitate discing	14	$50	$700	$500	$0	$1,200
	Coordinate discing	6	$50	$300	$0	$0	$300
	Contract discing	0	$0	$0	$1,500	$0	$1,500
	Biological monitor	0	$0	$0	$480	$0	$480
Total				**$1,900**	**$2,480**	**$0**	**$4,380**
Year I Estimate (3x/year)	**$10,740**						
Year II Estimate (2x/year)	**$6,660**						

Vegetation Establishment (Year II)							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Project Planning	Planning and coordination	40	$50	$2,000	$0	$0	$2,000
Enhancement of existing stands of desirable vegetation	Hand weeding to remove invasive species within desirable vegetation patches	20	$50	$1,000	$600	$0	$1,600
Seed Bed Cultivation	Rip, disc, chisel, ring roll	12	$50	$600	$4,800	$0	$5,400
Seasonal Marsh Enhancement (seeding)	Seed collection	6	$50	$300	$0	$0	$300
	Seeding and seeding mixture prep. and processing	14	$50	$700	$0	$504	$1,204
Wet Meadow Enhancement	Seed collection	35	$50	$1,750	$0	$0	$1,750
	Seeding and seeding mixture prep. and processing	86	$50	$4,300	$400	$6,273	$10,973
Native Grassland Enhancement	Seeding and seeding mixture prep. and processing	12	$50	$600	$0	$1,695	$2,295
Total				**$11,250**	**$5,800**	**$8,472**	**$25,522**

Maintenance 2 yrs (Year III, IV)							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Mowing	3x/year	78	$50	$3,900	$3,600	$300	$7,800
Herbicide	2x/year	16	$50	$800	$8,500	$0	$9,300
String Trimming		20	$50	$1,000	$0	$50	$1,050
Hand Removal		60	$50	$3,000	$1,800	$0	$4,800
Flame weeding	1x/year	6	$50	$300	$1,200	$0	$1,500
Monitoring for maintenance needs	24x/year	96	$50	$4,800	$0	$0	$4,800
Biological Monitoring	5x/year	0	$0	$0	$2,400	$0	$2,400
Total				**$13,800**	**$17,500**	**$350**	**$31,650**

Detailed Seeding Tables:

Wet Meadow Enhancement Detailed Seeding Table											
Total number of germinating seeds desired per square foot							55			Total Acres	8
Species		% desired proportion	seed per square foot	% purity of seed lot	% germination of seed lot	Estimated PLS% (% purity x % germ.)	estimated # of seeds per pound	Lbs/Acre (PLS)	Estimated Bulk Rate (lbs.)	Total PLS Qty (Lbs)	Total Estimated Bulk (lbs.)
Grasses and other Monocots											
Bulboschoenus robustus	Prairie Bulrush	1%	0.6	70%	40%	28.0%	450,000	0.2	0.7	1.5	5.4
Carex barbarae	Santa Barbara Sedge	1%	0.6	75%	40%	30.0%	450,000	0.2	0.6	1.4	4.7
Carex densa	Dense Sedge	2%	1.1	75%	40%	30.0%	450,000	0.4	1.2	2.8	9.5
Cyperus eragrostis	Nut Sedge	10%	5.5	75%	40%	30.0%	800,000	1.0	3.3	8.0	26.6
Danthonia californica	California Oat Grass	3%	1.4	75%	40%	30.0%	165,000	1.2	4.0	9.7	32.2
Echinochloa crus-galli	Barnyard Grass	1%	0.3	70%	40%	28.0%	40,000	1.1	3.8	8.5	30.5
Elymus glaucus	Blue wild rye	10%	5.5	80%	70%	56.0%	134,900	3.2	5.7	25.3	45.2
Hordeum bracyantherum	Meadow barley	32%	17.6	90%	70%	63.0%	100,800	12.1	19.1	96.4	153.1
Juncus effusis	Bog rush	8%	4.4	90%	80%	72.0%	2,800,000	0.1	0.1	0.8	1.1
Juncus patens	Spreading rush	8%	4.4	90%	80%	72.0%	2,800,000	0.1	0.1	0.8	1.1
Paspalum distichum	Ditchgrass	10%	5.5	75%	70%	52.5%	450,000	1.0	1.9	8.1	15.4
Subtotal		**85%**						**20.4**	**40.6**	**163.4**	**324.8**
Achillea millefolium	Yarrow	1%	0.6	50%	40%	20.0%	2,770,000	0.0	0.2	0.3	1.7
Artemesia douglasiana	Mugwort	1%	0.6	70%	70%	49.0%	341,800	0.1	0.3	1.1	2.3
Baccharis douglasii	Marsh Baccharis	2%	1.1	40%	60%	24.0%	3,000,000	0.1	0.3	0.5	2.2
Epilobium densiflorum	Dense flowered boidsvaldia	1%	0.6	40%	40%	16.0%	824,000	0.2	1.1	1.5	9.1
Euthamia occidentalis	Marsh goldenrod	3%	1.7	40%	40%	16.0%	3,000,000	0.1	0.9	1.2	7.5
Helenium puberium	Sneezeweed	1%	0.6	40%	50%	20.0%	2,770,000	0.0	0.2	0.3	1.7
Oenothera hookeri	Evening primrose	1%	0.6	40%	60%	24.0%	1,400,000	0.1	0.3	0.6	2.4
Subtotal		**10%**						**0.7**	**3.4**	**5.6**	**26.9**
Total		**95%**	**52.3**					**21.1**	**44.0**	**168.9**	**351.7**

Native Grassland Enhancement Detailed Seeding Table											
Total number of germinating seeds desired per square foot							50			Total Acres	1.3
Species		% desired proportion	seed per square foot	% purity of seed lot	% germination of seed lot	Estimated PLS% (% purity x % germ.)	estimated # of seeds per pound	Lbs/Acre (PLS)	Estimated Bulk Rate	Total PLS Qty (Lbs)	Total Estimated Bulk
Achillea mellifolium	Yarrow	5%	2.5	20%	70%	14.00%	2,770,000	0.3	2.0	0.4	2.6
Bromus carinatus	California Brome	13%	6.5	90%	70%	63.00%	103,000	4.4	6.9	5.7	9.0
Elymus glaucus	Blue wildrye	23%	11.3	90%	70%	63.00%	134,900	5.8	9.1	7.5	11.9
Festuca microstachys	Small fescue	15%	7.5	90%	70%	63.00%	300,000	1.7	2.7	2.2	3.6
Horkelia cuneata	Wavy-leafed horkelia	5%	2.5	50%	70%	35.00%	1,850,000	0.2	0.5	0.2	0.6
Hordeum bracyantherum	Meadow barley	5%	2.5	90%	70%	63.00%	100,800	1.7	2.7	2.2	3.5
Nassella pulchra	Purple needle grass	25%	12.5	60%	70%	42.00%	150,000	8.6	20.5	11.2	26.7
Sisyrinchium bellum	Blue eyed grass	9%	4.5	95%	70%	66.50%	200,000	1.5	2.2	1.9	2.9
Total		**100%**	**49.8**					**24.1**	**46.8**	**31.3**	**60.8**

Appendix C. Specifications for Establishing Plant Material with Intensive Transplanting:

Seeding Quantities:

Seasonal Wetland Enhancement I Seeding Quantities, Establishing Plant Material by Seed			
7' - 8' elevation range			
Species	**Common Name**	**Sowing Rate (PLS): Lbs./Acre**	**Total Quantity Pure Live Seed (Lbs.)**
Bidens laevis	Marsh marigold	5.0	1.0
Helenium puberium	Sneezeweed	5.0	1.0
Mimulus guttatus	Seep monkey flower	2.0	0.4
Scirpus robustus	Prairie bulrush	5.0	1.0
Total		17.0	3.4

Seasonal Wetland Enhancement II, Establishing Plant Material by Seed			
8' - 9' Elevation range			
Species	**Common Name**	**Sowing Rate (PLS): Lbs./Acre**	**Total Quantity Pure Live Seed (Lbs.)**
Epilobium densiflorum	Dense flowered boidsvaldia	1.0	1.4
Helenium puberium	Sneezeweed	3.0	4.2
Hordeum bracyantherum	Meadow barley	6.0	8.4
Juncus effusis	Bog rush	1.5	2.1
Juncus patens	Spreading rush	1.0	1.4
Scirpus robustus	Prairie bulrush	2.0	2.8
Total		14.5	20.3

Wet Meadow Enhancement Seed Quantity, Establishing Plant Material with Transplants			
Species		**Lbs./Acre (PLS)**	**Total PLS Qty (Lbs.)**
Grasses and other Monocots			
Bulboschoenus robustus	Prairie Bulrush	0.09	0.69
Carex barbarae	Santa Barbara Sedge	0.08	0.64
Carex densa	Dense Sedge	0.16	1.29
Cyperus eragrostis	Nut Sedge	0.45	3.63
Danthonia californica	California oat grass	0.90	7.30
Echinochloa crus-galli	Barnyard Grass	0.49	3.88
Elymus glaucus	Blue wild rye	1.40	11.50
Hordeum bracyantherum	Meadow barley	5.1	41.1
Juncus effusis	Bog rush	0.04	0.35
Juncus patens	Spreading rush	0.04	0.35
Paspalum distichum	Ditchgrass	0.46	3.68
Subtotal		9.61	76.91
Forb Species			
Achillea millefolium	Yarrow	0.02	0.16
Artemesia douglasiana	Mugwort	0.06	0.52
Baccharis douglausii	Marsh Baccharis	0.03	0.24
Epilobium densiflorum	Dense flowered boidsvaldia	0.08	0.66
Euthamia occidentalis	Marsh goldenrod	0.07	0.54
Helenium puberium	Sneezeweed	0.02	0.16
Oenothera hookerii	Evening primrose	0.03	0.26
Subtotal		0.32	2.54
Total		9.15	73.23

Native Grassland Enhancement, Seeding Quantity, Establishing Plant Material with Transplants			
Species		**Lbs./Acre (PLS)**	**Total PLS Qty (Lbs.)**
Achillea mellifolium	Yarrow	0.1	0.2
Bromus carinatus	California Brome	2.5	3.3
Elymus glaucus	Blue wildrye	0.7	1.0
Festuca microstachys	Small Fescue	0.7	1.0
Horkelia cuneata	Wavy-leafed horkelia	0.1	0.1
Hordeum bracyantherum	Meadow barley	0.9	1.1
Nassella pulchra	Purple needle grass	4.3	5.6
Sisyrinchium bellum	Blue eyed grass	0.7	1.0
Total		12.3	16.0

Budget Summary:

Establishing Plant Material with Transplants	
Site Preparation for Invasive Weed Control Prior to Grading and Excavation	$15,000
Vegetation Establishment	$91,488
Maintenance	$41,840
Biological Monitoring	$5,400
Subtotal	$153,728
Contingency (5%)	$7,686.40
Total	$161,414.31

Cost Estimate By Year	
Year I	$10,740
Year II	$98,148
Year III	$22,420
Year IV	$22,420
Subtotal	$153,728
Contingency (5%)	$7,686.40
Total	$161,414.31

It should be noted that the unit cost of purchase for transplant plugs is the one of most significant cost factor for budgetary planning. Moderate cost estimates were used for the above cost estimate. It is reasonable to assume that this cost could be lowered at the time of implementation. See detailed transplant tables for further detail.

Budget Detail:

Establishing Plant Material By Transplant

Site Prepration for Invasive Weed Control Prior to Grading and Excavation							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Site Preperation	Survey site for desirable vegetation	14	$50	$700	$0	$0	$700
	Generate map	4	$50	$200	$0	$0	$200
	Mowing to facilitate discing	14	$50	$700	$500	$0	$1,200
	Coordinate discing	6	$50	$300	$0	$0	$300
	Contract discing	0	$0	$0	$1,500	$0	$1,500
	Biological monitor	0	$0	$0	$480	$0	$480
Total				**$1,900**	**$2,480**	**$0**	**$4,380**
Year I Estimate (3x/year)	**$10,740**						
Year II Estimate (2x/year)	**$6,660**						

Vegetation Establishment (Year II)							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Project Implementation Planning	Planning and coordination	40	$50	$2,000	$600	$0	$2,600
Enhancement of existing stands of desirable vegetation	Hand weeding to remove invasive species within desirbale vegetation patches	24	$50	$1,200	$600	$0	$1,800
Seed Bed Cultivation	Rip, disc, chissel, ring roll	16	$50	$800	$6,600	$0	$7,400
Seasonal Marsh Enhancement (seeding)	Seed collection	4	$50	$200	$0	$0	$200
	Seeding and seeding mixture prep. and processing	18	$50	$900	$504	$0	$1,404
Wet Meadow Enhancement	Seed collection	11	$50	$550	$0	$0	$550
	Seeding and seeding mixture prep. and processing	70	$50	$3,500	$800	$4,562	$8,862
	Transplanting	168	$50	$8,400	$12,000	$40,941	$61,341
Native Grassland Enhancement	Seeding and seeding mixture prep. and processing	12	$50	$600	$0	$1,356	$1,956
	Transplanting	24	$50	$1,200	$1,820	$2,355	$5,375
Total				**$16,150**	**$20,504**	**$46,859**	**$91,488**

Maintenance 2yrs (Year III, IV)							
Task	**Description**	**Hours**	**Rate**	**Labor**	**Contract Services**	**Materials**	**Subtotal**
Irrigation	Installation	40	$50	$2,000	$5,000	$0	$7,000
	Maintenance	100	$50	$5,000	$0	$0	$5,000
Mowing	3x/year	84	$50	$4,200	$2,400	$0	$6,600
Herbicide	2x/year	16	$50	$800	$8,500	$0	$9,300
Flame weeding	1x	6	$50	$300	$1,440	$0	$1,740
String Trimming		20	$50	$1,000	$0	$0	$1,000
Hand Removal		80	$50	$4,000	$2,400	$0	$6,400
Monitoring for maintenance needs	24x/year	96	$50	$4,800	$0	$0	$4,800
Biological Monitoring	5x/year	0	$0	$0	$3,000	$0	$3,000
Total				**$22,100**	**$22,740**	**$0**	**$44,840**

Detailed Seeding and Transplant Tables:

Seeding Tables:

Native Grassland Enhancement Seeding Quantity, Establishing Plant Material with Transplants											
Total number of germinating seeds desired per square foot							25			Total Acres	1.3
Species		% desired proportion	seed per square foot	% purity of seed lot	% germination of seed lot	Estimated PLS% (% purity x % germ.)	estimated # of seeds per pound	Lbs/Acre (PLS)	Estimated Bulk Rate	Total PLS Qty (Lbs)	Total Estimated Bulk
Achillea mellifolium	Yarrow	5%	1.3	20%	70%	14.00%	2,770,000	0.1	1.0	0.2	1.3
Bromus carinatus	California Brome	15%	3.8	90%	70%	63.00%	103,000	2.5	4.0	3.3	5.2
Elymus glaucus	Blue wildrye	23%	5.6	90%	70%	63.00%	134,900	2.9	4.6	3.7	5.9
Festuca microstacys	Small fescue	13%	3.3	90%	70%	63.00%	300,000	0.7	1.2	1.0	1.5
Horkelia cuneata	Wavy-leafed horke	5%	1.3	50%	70%	35.00%	1,850,000	0.1	0.2	0.1	0.3
Hordeum bracyanther	Meadow barley	5%	1.3	90%	70%	63.00%	100,800	0.9	1.4	1.1	1.8
Nassella pulchra	Purple needle grass	25%	6.3	60%	70%	42.00%	150,000	4.3	10.3	5.6	13.4
Sisyrinchium bellum	Blue eyed grass	9%	2.3	95%	70%	66.50%	200,000	0.7	1.1	1.0	1.4
Total		**100%**	**24.9**					**12.3**	**23.7**	**16.0**	**30.8**

Wet Meadow Enhancement Seeding List, Seeding Quantity, Establishing Plant Material with Transplants											
Total number of germinating seeds desired per square foot							25			Total Acres	8
Species		% desired proportion	seed per square foot	% purity of seed lot	% germination of seed lot	Estimated PLS% (% purity x % germ.)	estimated # of seeds per pound	Lbs/Acre (PLS)	Estimated Bulk Rate (lbs.)	Total PLS Qty (Lbs)	Total Estimated Bulk (lbs.)
Grasses and other Monocots											
Bulboschoenus robustus	Prairie Bulrush	1%	0.3	70%	40%	28.0%	450,000	0.1	0.3	0.7	2.5
Carex barbarae	Santa Barbara Sedge	1%	0.3	75%	40%	30.0%	450,000	0.1	0.3	0.6	2.1
Carex densa	Dense Sedge	2%	0.5	75%	40%	30.0%	450,000	0.2	0.5	1.3	4.3
Cyperus eragrostis	Nut Sedge	10%	2.5	75%	40%	30.0%	800,000	0.5	1.5	3.6	12.1
Danthonia californica	CA oatgrass	5%	1.3	75%	40%	30.0%	200,000	0.9	3.0	7.3	24.2
Echinochloa crus-galli	Barnyard Grass	5%	1.3	70%	40%	28.0%	400,000	0.5	1.7	3.9	13.9
Elymus glaucus	Blue wild rye	10%	2.5	80%	70%	56.0%	134,900	1.4	2.6	11.5	20.6
Hordeum bracyantherum	Meadow barley	30%	7.5	90%	70%	63.0%	100,800	5.1	8.2	41.1	65.2
Juncus effusis	Bog rush	8%	2.0	90%	80%	72.0%	2,800,000	0.0	0.1	0.3	0.5
Juncus patens	Spreading rush	8%	2.0	90%	80%	72.0%	2,800,000	0.0	0.1	0.3	0.5
Paspalum distichum	Ditchgrass	10%	2.5	75%	70%	52.5%	450,000	0.5	0.9	3.7	7.0
Subtotal		**90%**						**9.3**	**19.1**	**74.4**	**152.8**
Achillea millefolium	Yarrow	1%	0.3	50%	40%	20.0%	2,770,000	0.0	0.1	0.2	0.8
Artemesia douglasiana	Mugwort	1%	0.3	70%	70%	49.0%	341,800	0.1	0.1	0.5	1.1
Baccharis douglausii	Marsh Baccharis	2%	0.5	40%	60%	24.0%	3,000,000	0.0	0.1	0.2	1.0
Epilobium densiflorum	Dense flowered boidsvaldia	1%	0.3	40%	40%	16.0%	824,000	0.1	0.5	0.7	4.1
Euthamia occidentalis	Marsh goldenrod	3%	0.8	40%	40%	16.0%	3,000,000	0.1	0.4	0.5	3.4
Helenium puberium	Sneezeweed	1%	0.3	40%	50%	20.0%	2,770,000	0.0	0.1	0.2	0.8
Oenothera hookerii	Evening primrose	1%	0.3	40%	60%	24.0%	1,400,000	0.0	0.1	0.3	1.1
Subtotal		**10%**						**0.3**	**1.5**	**2.5**	**12.2**
Total		**100%**	**25.0**					**9.61**	**20.6**	**76.91**	**165.0**

Transplanting Tables for Container Stock:

Wet Meadow Enhancement Container Plant Species List, 8'-11' Elevation						Acres	%
Species Name	Common Name	Planting density (feet on center)	Site Specific Elevation Range	Total	Growth Habitat	Mowing tolerance	Parent Material Available within Watershed
Baccharis douglasii	Marsh baccharis	1	8' - 9'	19488	Perennial	High	x
Carex barbarae	Santa Barbara	1	8' - 10'	19488	Perennial	Medium	x
Carex pallida	Woolley sedge	1	8' - 9'	19488	Perennial	Medium	x
Elymus glaucus	Blue wild rye	1	9' - 11'	36540	Perennial	High	x
Elymus triticoides	Creeping wild rye	1	8' 12'	48720	Perennial	High	x
Euthamia	Marsh goldenrod	1	8' - 10'	24360	Perennial	High	x
Hordeum	Meadow barley	1	8'- 11'	48720	Perennial	High	x
Juncus	Brown-headed	1	8' - 9'	2436	Perennial	Medium	x
Juncus mexicana	Mexican rush	1	8' - 9'	2436	Perennial	Low	x
Oenothera hookerii	Evening primrose	1	8' - 10'	4872	Annual,	Low	x
Minor Species							
Artemesia	Mugwort	1	8' - 11'	7308	Perennial	Low	x
Carex obnuta	Slough Sedge	3	8' - 9'	731	Perennial	Medium	x
Juncus effusis	Bog rush	3	8' - 10'	804	Perennial	Low	x
Juncus patens	Spreading rush	3	8' - 12'	804	Perennial	Medium	x
Juncus xiphoides	Iris leaved rush	1	8' - 9'	487	Perennial	Medium	x
Rosa californica	California rose	3	9' - 12'	804	Perennial	Low	x
Total				237486			

Spacing	Square feet	Per Sq ft Rate	On site percentage	Total #	Unit Cost	Total Production Cost
1	348000	243600	8.0%	19488	0.15	$2,923
1	348000	243600	8.0%	19488	0.3	$5,846
1	348000	243600	8.0%	19488	0.3	$5,846
1	348000	243600	15.0%	36540	0.05	$1,827
1	348000	243600	20.0%	48720	0.3	$14,616
1	348000	243600	10.0%	24360	0.15	$3,654
1	348000	243600	20.0%	48720	0.05	$2,436
1	348000	243600	1.0%	2436	0.25	$609
1	348000	243600	1.0%	2436	0.25	$609
1	348000	243600	2.0%	4872	0.15	$731
	348000					
	348000					
1	348000	243600	3.0%	7308	0.15	$1,096
1	348000	243600	0.3%	731	0.25	$183
0.33	348000	80388	1.0%	804	0.15	$121
0.33	348000	80388	1.0%	804	0.15	$121
1	348000	243600	0.2%	487	0.25	$122
0.33	348000	80388	1.0%	804	0.25	$201
			100%	237486		$40,941

Native Grassland Enhancement Container Stock table						Acres	1.3
Species Name	Common Name	Planting density (feet on center)	Site Specific Elevation Range	Total	Growth Habitat	Mowing Tollerance	Parent Material Available within Watershed
Achillia millifolia	Yarrow	1	10' - 12'	3959	Perennial	High	x
Carex tumilacola	Hillsweller sedge	1	11' - 12'	396	Perennial	High	x
Elymus glaucus	Blue wildrye	1	10' - 12'	11876	Perennial	High	x
Elymus triticoides	Creeping wildrye	1	10' - 12'	3959	Perennial	High	x
Hordeum bracyantherum	Meadow barley	1	10' - 12'	3959	Perennial	High	x
Horkelia cuneata	Wavy leafed horkelia	1	10' - 12'	792	Perennial	High	x
Rosa californica	Wild rose	2	10' - 12'	0	Perennial	Low	x
Sisyrinchium bellum	Blue eyed grass	1	10' - 12'	0	Perennial	Medium	x
Stipa pulchra	purple needle grass	1	11' - 12'	0	Perennial	High	x
Total				24939			

Spacing	Square feet	Per Sq ft Rate	On site percentage	Total #	Unit Cost	Total Production Cost
1	56550	39585	10%	3958.5	0.1	$396
1	56550	39585	1%	395.85	0.25	$99
1	56550	39585	30%	11875.5	0.05	$594
1	56550	39585	10%	3958.5	0.25	$990
1	56550	39585	10%	3958.5	0.05	$198
1	56550	39585	2%	791.7	0.1	$79
0.5	1.3	0.455	2%	0.0091	0.25	$0
1	1.3	0.91	10%	0.091	0.1	$0
1	1.3	0.91	25%	0.2275	0.2	$0
			100%	24939		$2,355

Appendix D.

Bryant Habert Plant Materials and Vegetation Management Memo
7/5/2013, rev. 2

In consideration of the size and scale of vegetation management and native vegetation establishment activities on the Bryant Habert property, extensive research has been conducted on approaches that have been proven to be successful in similar settings. The total limit of disturbance incorporates approximately 30 acres. Re-vegetation activities are planned for approximately 10 acres within this area, due to the presence of undesirable invasive weeds within this acreage. Several peer reviewed papers have been written that are applicable to the re-vegetation work and these are listed at the end of this memo. Additionally, a number of professionals were consulted on methods. Their input is detailed below by project objective or practice.

Objective: Establish sufficient cover through re-vegetation to exclude broadleaf weeds such as bristly ox-tongue post grading and establish desirable plant communities/native habitat.

Several alternatives have been discussed for this objective including:

-large scale transplanting of native plant plugs with agricultural transplant equipment
-use of monocot species (i.e. grass) and subsequent favorable management such as flaming and broadleaf herbicide
-utilizing a mixture of native and quick growing non-native naturalized annual species (such as blando brome or zoro fescue) to provide quick cover.
-Seeding a mixture of native grass and forb species with "islands" of transplanted rhizomatous plant material throughout the seeded area
-Seeding with a naturally re-seeding cover crop species, such as annual rye, used on the Watsonville Slough Farms property

Use of Non-native plant material: Rich Casale, District conservationist in SC County, recommended only zoro fescue as a naturalized annual that would be short stature and might integrate with native plant material. He commented that blando brome would likely grow too tall on the wet and heavy clay soils found on the site. Rich also recommended use of quick growing natives like meadow barley and red fescue. Our experience on Watsonville Slough Farm has shown that annual rye, var. AGS 104, a proprietary rust resistant variety, is a very effective cover crop that annually re-seeds. Like blando brome, it is believed to be likely too aggressive and tall growing to integrate successfully with native plant material. However, we have an on-going trial of this in the Middle Watsonville Slough grassland enhancement project adjacent to the Bryant Habert property where we have seeded native plant material into a previously cover cropped field. The rye has re-grown significantly despite successive irrigation and disking prior to seeding native plant grasses and forbs. From this trial we will learn the methods required for this species to be integrated successfully with native seed, but it is clear that it would require pre-irrigation (either natural or manual) and tillage prior to planting native seed due to its ability to form robust stands quickly. Other naturalized annual grasses that could be considered include slender wild oats and barbed wild oats. Zoro fescue was considered, however published literature and field trials have shown this to suppress native species from establishing and failing to resist the establishment of non-native and invasive plant species.

Both Jeanette Wrysinski (Executive Director with Yolo County RCD) and Chris Rose (Executive Director with Solano County RCD), were strongly discouraging of the use of non-native seed in a native seed mix. Both have had good success and significant experience with native plant establishment from

seed. Both commented strongly that use of naturalized non-natives would out-compete native plants and serve to counter the goals of native plant establishment. Several journal articles had the same findings, as noted at the end of this memo.

Both contacted felt the most effective method for native grass cover establishment is utilization of seeded grass species followed by successive applications of a broadleaf herbicide. Chris recommended planning to spray or mow, depending on broadleaf establishment 2 x per year for 2 years. He also recommended using quick growing native grasses like meadow barley as a nurse crop. Both persons have experience using rhizomatous grasses from seed such as creeping wild rye, which are not available from local watershed stock. Jeanette recommended considering separating forb plantings from grass plantings as the Xerces society has found to be effective. Chris noted that one of his colleagues is having success integrating some forb seed into the mixes and continuing with broadleaf herbicide applications. Due to the timing of germination rates and variability of plant cover, this colleague is finding that some forbs are persisting on the site. Both Chris and Jeanette noted that control of bristly ox-tongue with herbicides would be successful in their experience.

Other native plant materials that were recommended aside from meadow barley and creeping wild rye for quick and effective cover were iris leafed rush and brown headed rush (by Josh Fodor, Central Coast Wilds). Our experience with previous plantings on the Bryant Habert property and observations of existing and self-propagating native plant species on site demonstrate that Santa Barbara sedge, Marsh goldenrod, Creeping wild rye, Horsetail fern, Bog rush, Mexican rush, and Spreading rush are all able to establish and compete well on this site. Natural recruitment of sneezeweed and marsh baccharis have been observed on the site and would make good candidates for larger scale establishment efforts. Dense sedge, Pacific oenanthe and wild rose have also been successfully established from container stock.

Mechanical Transplanting

Mechanical transplanting is felt to be a strong candidate for successful establishment of native plant material.

Native Plug Production: A number of commercial nurseries have been approached for their willingness to grow native plant plugs from seed produced from local sources, such as from the on-site native seed farm. Several large scale commercial nurseries in Watsonville and Gilroy with extensive experience with plug production have agreed to grow plugs with a low cost per plug unit cost if produced in a high volume. Other nurseries in Watsonville has expressed an interest in growing plugs from divisions for rhizomatous plant species. Difficult to grow species are recommended to be grown at the nursery facility at the Fitz Wetlands Educational Resource Center (WWW), due to the complexity and special attention needed and the ability to offset costs with student and volunteer labor.

Transplanting: There are a few examples of successful use of standard agricultural equipment for this purpose. The NRCS Lockford Plant Materials Center has experience using this. US Fish and Wildlife Service has used this equipment in the Central Valley in California and contracted this plug production with a nursery in Watsonville. Hedgerow Farms in Yolo County is using tomato transplant equipment for native seed production beds. A restoration project on the Owens Lake eastern California has used this technique for large-scale planting of salt grass. River Partners in Chico, California has used this technique with limited success and commented that this can be a successful technique though they had challenges properly calibrating the equipment, which they believed to the key to success. Steve Pederson, of High Ground Organics has a two seat mechanical transplanter and has agreed to do a trail planting this fall. Growers Transplant in Salinas conducts the transplanting for Lakeside Organics on the Watsonville

Slough Farms property. They would be willing to transplant native plugs as a part of a grassland restoration effort in-expensively, but their equipment is set up for listed beds and is unable to transplant directly into the ground. This is believed to be a significant obstacle at this time, given the scale of Growers Transplants operation and their potential inability to fine tune work on a small scale project (10 acres or less). Their cost however would be acceptable to the LTSCC. Further work on finding the most effective and cost efficient transplant method is still needed. A worksheet has been created on this subject. Hand transplant is estimated to be able to plant 800 – 1000 plugs per person per day and could be an option for smaller "island" plantings. Highly managed, mulched plantings with larger container sizes (2" – 4" containers) cost approximately $30K - $35K per acre over three to four years of establishment, which would be the highest cost for this effort, but is felt to be unnecessary due to the high incidence of recruitment of native plants on the site and too costly.

Objective: Provide performance metrics that are realistic and achievable while meeting the goals of habitat enhancement for the project

There is a wide variety of opinions on acceptable and reachable percent cover metrics for native plant species. While Jeanette Wrysinski (Yolo County RCD) commented that 50% cover was achievable for projects that establish native grass cover by seed in their experience if given the proper care and sufficient time for establishment; Chris Rose, (Solano County RCD) commented that they do not use percent cover of native species as a performance metric if they can avoid it, based on the difficulty of controlling naturalized annual species that are not problematic to habitat objectives, such as annual European grasses or forbs which do not outcompete native plants.

Experience with establishment of seeded native plant material on WSF shows that over 40% cover of native plant species is achievable after 2 years on recently retired agricultural fields (Hanson Slough upland enhancement project), but this may be significantly more difficult on the Bryant Habert property due to the heavy clay soils with a high moisture content and the fact that there are two years of limited weed control efforts since the field was retired from agricultural production, allowing weeds to establish. Site preparation prior to planting is believed to be therefore, critical to the successful establishment of native plant material from seed.

Currently willow species occupy 6 acres (approximately 20% cover) of the 30 acres considered within the limit of disturbance.

Peer-reviewed articles and other resources:

Evaluation of the use of native and non-native grass seed in restoration and re-vegetation:

NRCS, Plant Materials Technical Note, No. 75, Elkhorn Slough Watershed Grass Performance Conservation Field Trial Results

This technical note describes a two year conservation field trial designed to evaluate and promote the use of grasses for erosion control in northern Monterey County, California. Compares native and naturalize annual and perennial grasses in growth habitat, percent cover, and re-seeding.

NRCS Technical Memo – TN-Plant Materials-39 1995. Effectiveness of annual and perennial grasses and legume species for early emergence and erosion control.

A Caltrans Study which evaluates emergence and cover of native and non-native grass species.

Brown, C. S. and K. J. Rice. 2000. The mark of Zorro: effects of the exotic annual grass *Vulpia myuros* on California native perennial grasses. Restoration Ecology 8:10–17.

Examines the impact of zoro fescue on native grassland restoration efforts when included in a seeding mixture and concludes that this is counter-productive to restoration objectives due to suppression of native grasses.

Corbin, J. D. and C. M. D'Antonio. 2004. Competition between native perennial and exotic annual grasses: implications for an historical invasion. Ecology 85:1273–1283.

Peer-reviewed journal article which demonstrates the ability of established native grasses to withstand competition and out-compete non-native naturalized annual grasses.

Felicia A. Rein, Marc Los Huertos, Karen D. Holl, and Jean H. Langenheim. 2007. Restoring native grasses as vegetative buffers in a coastal California agricultural landscape. Madrono

Evaluates varying seeding rates and mixes with native and non-native erosion control mix species, such as zoro fescue. Concludes that the mixture of native and non-native species is counterproductive and details the need for on-going management which favors native species.

Stomberg, Kephart, Yardon Composition, invasibility, and diversity in coastal California grasslands,

Describes historical data on native grassland restoration sites and background information on reference conditions for California native grasslands; describes challenges to native grassland restoration efforts, including the presence of pocket gophers.

Establishment of Native Plant Material from Seed:

NRCS, Plant Materials Technical Note, TN-Plant Materials-CA-5 Revision 2, Basic Seed Data Supporting NRCS Vegetative Guides

Technical memo which describes seeding rate calculations, germination rates, seeds per pound, and seeds per square foot of native species

NRCS, Plant Materials Technical Note, Plant Materials No. 35. 2003. Considerations for establishing native grasses from seed for restoration, re-vegetation, and erosion control in Western Washington and Western Oregon.

NRCS, Plant Materials Technical Note, No. 38. 2001. Users guide to description, propagation, and establishment of wetland plant species and grasses for riparian areas for Intermountain west.

Corbin, J. D., C. M. D'Antonio, and S. Bainbridge. 2004. Tipping the balance in the restoration of native plants: experimental approaches to changing the exotic : native ratio in California grassland. *in* Gordon, M. and S. Bartol, editors. Experimental approaches to conservation biology Berkeley, CA University of California Press. 154–179.

Stromberg, M. R. and J. R. Griffin. 1996. Long-term patterns in coastal California grasslands in relation to cultivation, gophers, and grazing. Ecological Applications 6:1189–1211

Stromberg, M. R. and P. Kephart. 1996. Restoring native grasses to California old fields. Restoration and Management Notes 14:102–111.

Attachment 4

Special Status Plant and Wildlife Tables

May 2014

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Table C-1. Special Status Plant Species with Potential to Occur in the Bryant-Habert Wetland Restoration Project Region

Species Name	Common Name	Federal, State, & CNPS Listing[1]	Habitat Preferences & Distribution Information	Flowering Phenology/ Life Form	Habitat Suitability & Local Distribution	Potential For Occurrence
Chorizanthe robusta var. robusta	robust spineflower	FE, 1B.1	Cismontane woodland, coastal dunes, coastal scrub. Sandy terraces and bluffs or in loose sand. 3-120m.	April-September annual herb	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 4.25 miles from site, south of entrance to Manresa State Beach (EONDX #9617).	Not expected
Piperia yadonii	Yadon's rein orchid	FE, 1B.1	Closed-cone coniferous forest, chaparral, coastal bluff scrub. On sandstone and sandy soil, but poorly drained and often dry. 10-415m.	February-August perennial herb	No suitable vegetation associations present. Nearest CNDDB (2013) record is approx. 4 miles from site (EONDX #7361) on ridge (North) of Blohm Ranch.	Not expected
Ceanothus ferrisiae	Coyote ceanothus	FE, 1B.1	Chaparral, Coastal scrub, Valley and foothill grassland, serpentinite. 120-460m	Jan-May evergreen shrub	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Chorizanthe pungens var. hartwegiana	Ben Lomond spineflower	FE, 1B.1	Occurs in lower montane coniferous forest (maritime ponderosa pine sandhills). Known from SCR County between 5-365m Known only from sandhill parklands in the Santa Cruz Mountains.	April-July annual herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Chorizanthe robusta var. hartwegii	Scotts Valley spineflower	FE, 1B.1	Meadows, valley and foothill grassland. In grasslands with mudstone and sandstone outcrops. 230-245m.	April-July annual herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected

Species Name	Common Name	Federal, State, & CNPS Listing[1]	Habitat Preferences & Distribution Information	Flowering Phenology/ Life Form	Habitat Suitability & Local Distribution	Potential For Occurrence
Dudleya abramsii ssp. setchellii	Santa Clara Valley dudleya	FE, 1B.1	Santa Clara serpentinite, Cismontane woodland, Valley and foothill grassland, 60-455m.	April-October perennial herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Erysimum teretifolium	Santa Cruz wallflower	FE, SE, 1B.1	Occurs in inland marine sands in chaparral and lower montane coniferous forest. Known from SCR County between 120-610m.	March-July perennial herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Pentachaeta bellidiflora	white-rayed pentachaeta	FE, SE, 1B.1	Often occurs on serpentine in valley and foothill grassland. Specimen collected at the Indians in MNT County is likely *P. exilis var. aeolica.* Known from only one extended occurrence bisected by Highway 280 and one occurrence in the Santa Lucia Mountains between 35-620m. Extant in SMT and presumed extirpated in MRN and SCR counties.	March-May annual herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Polygonum hickmanii	Scotts Valley polygonum	FE, SE, 1B.1	Isolated patches of shallow soil underlain by outcrops of Santa Cruz mudstone and Purisima sandstone in fragments of coastal prairie.	May-August annual herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Gilia tenuiflora ssp. arenaria (also called monterey gilia)	sand gilia	FE, ST, 1B.2	Coastal dunes, coastal scrub, chaparral (maritime), cismontane woodland. Bare, wind-sheltered areas often near dune summit or in the hind dunes; 2 records from pleistocene inland dunes. 0-245m.	April-June annual herb	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 1.8 miles from site (EONDX #20125) from Sunset Beach State Park.	Not expected

Species Name	Common Name	Federal, State, & CNPS Listing[1]	Habitat Preferences & Distribution Information	Flowering Phenology/ Life Form	Habitat Suitability & Local Distribution	Potential For Occurrence
Chorizanthe pungens var. pungens	Monterey spineflower	FT, 1B.2	Coastal dunes, chaparral, cismontane woodland, coastal scrub. Sandy soils in coastal dunes or more inland within chaparral or other habitats. 0-150m.	April-August annual herb	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 1.8 miles from site (EONDX #2612) from Sunset Beach State Park, along Shell Road	Not expected
Holocarpha macradenia	Santa Cruz tarplant	FT, CH, SE, 1B.1	Coastal prairie, valley and foothill grassland. Light, sandy soil or sandy clay; often with nonnatives. 10-260m.	June-October annual herb	Suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 1.1 miles from site (EONDX #7398) from east side of Harkins Slough, just south of Harkins Slough Rd.	Possible
Cordylanthus rigidus ssp. littoralis	seaside bird's-beak	SE, 1B.1	Closed-cone coniferous forest, chaparral, cismontane woodland, coastal. Sandy, often disturbed sites, usually within chaparral or coastal scrub. 0-215m.	April-October annual herb (hemiparasitic)	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Plagiobothrys diffusus	San Francisco popcornflower	SE, 1B.1	Occurs in coastal prairie and valley and foothill grassland. Known from ALA, SCR, and SMT counties between 60-360m. Presumed extirpated from SFO County. Recognized as P. reticulatus var. rossianorum in TJM.	March-June annual herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Pedicularis dudleyi	Dudley's lousewort	SR, 1B.2	Occurs in maritime chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland. Known from fewer than ten occurrences from MNT, SLO, and SMT counties between 60-900m.	April-June perennial herb	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 7 miles from site (EONDX #35698) in Aptos.	Not expected

Species Name	Common Name	Federal, State, & CNPS Listing[1]	Habitat Preferences & Distribution Information	Flowering Phenology/ Life Form	Habitat Suitability & Local Distribution	Potential For Occurrence
California Native Plant Society Listed and Locally Rare Species						
Carex comosa	bristly sedge	2.1	Marshes and swamps. Lake margins, wet places. Between -5-1005m (site below sea level is on a Delta island)	May-September perennial rhizomatous herb	No CNDDB (CDFW 2014) records from region.	Not expected
Clarkia concinna ssp. automixa	Santa Clara red ribbons	4.3	Occurs in chaparral and cismontane woodland. Known from ALA and SCL counties between 90-1,500m	May-July annual herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Arctostaphylos pajaroensis	Pajaro manzanita	1B.1	Occurs in chaparral on sandy soils. Known from MNT and SBT counties between 30-760m. Presumed extirpated from SCR County.	December-March shrub (evergreen)	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 4 miles from site (EONDX #63259), nonspecific area. Eagle's Ridge Rd., near Corncob Canyon; SE of Watsonville.	Not expected
Ericameria fasciculata	Eastwood's goldenbush	1B.1	Closed-cone coniferous forest, chaparral (maritime), coastal scrub, coastal dunes. In sandy openings. 30-275m.	July-October perennial evergreen shrub	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 4 miles from site (EONDX #68144) from ridge north of Blohm Ranch	Not expected
Horkelia cuneata var. sericea	Kellogg's horkelia	1B.1	Occurs on sandy or gravelly site of openings in closed-cone coniferous forest, maritime chaparral, coastal dunes, and coastal scrub. Known MNT, SBA, SCR, SLO, and SMT counties 10-200m. Presumed extirpated from ALA, MRN, and SFO counties.	April-September perennial herb	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 3.1 miles from site (EONDX #30320) from about 2 miles west of Watsonville Municipal Airport.	Not expected

Species Name	Common Name	Federal, State, & CNPS Listing[1]	Habitat Preferences & Distribution Information	Flowering Phenology/ Life Form	Habitat Suitability & Local Distribution	Potential For Occurrence
Calyptridium parryi var. hesseae	Santa Cruz Mountains pussypaws	1B.1	Occurs on sandy or gravelly sites in openings of chaparral and cismontane woodland. Known <20 occurrences from MNT, SCL, and SCR counties. 305-1,530m.	May-August annual herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Hoita strobilina	Loma Prieta hoita	1B.1	Chaparral, cismontane woodland, riparian woodland. Serpentine; mesic sites.	May-October perennial herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Trifolium buckwestiorum	Santa Cruz clover	1B.1	Occurs on gravelly margins of broadleafed upland forest, cismontane woodland, and coastal prairie. Often occurs in roadbeds. Known from MEN, MNT, SCR, and SON counties between 105-610m.	April-October annual herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Monolopia gracilens	woodland woollythreads	1B.2	Occurs on serpentine substrate in broadleafed upland forest (openings), chaparral (openings), cismontane woodland, North Coast coniferous forest (openings), and valley and foothill grassland. Known from ALA, CCA, MNT, SCL, SCR, SLO, and SMT counties between 100-1,200m.	February-July annual herb	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 5.5 miles from site (EONDX #80114) from Corralitos Rd. near Corralitos, Santa Cruz mountains.	Not expected
Trifolium hydrophilum	saline clover	1B.2	Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. 0-300m.	April-June annual herb	Suitable vegetation associations present Nearest CNDDB (CDFW 2014) record is approx. 5.3 miles from site (EONDX #49389) from wetlands east of Jetty Rd. and Highway 1 junction.	Possible

Species Name	Common Name	Federal, State, & CNPS Listing[1]	Habitat Preferences & Distribution Information	Flowering Phenology/ Life Form	Habitat Suitability & Local Distribution	Potential For Occurrence
Fritillaria liliacea	fragrant fritillary	1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland near the coast, on clay or serpentinite. Known from ALA, CCA, MNT, MRN, SBT, SCL, SFO, SMT, SOL and SON counties between 3-410m.	February-April perennial herb (bulbiferous)	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 8.45 miles from site (EONDX #6095), one mile south of Aromas.	Not expected
Streptanthus albidus ssp. peramoenus	most beautiful jewel-flower	1B.2	Chaparral, valley and foothill grassland, cismontane woodland. Serpentine outcrops, on ridges and slopes. 120-730m.	March-October annual herb	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) recorded occurrence is (EONDX #26360), approx. 11.4 miles East of site in Santa Clara county.	Not expected
Arctostaphylos hookeri ssp. hookeri	Hooker's manzanita	1B.2	Chaparral, coastal scrub, closed-cone coniferous forest, cismontane woodland. Sandy soils, sandy shales, sandstone outcrops. 85-300m.	January-June perennial evergreen shrub	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 3 miles from site (EONDX #66307) from ridge north of Blohm Ranch.	Not expected
Centromadia parryi ssp. congdonii	Congdon's tarplant	1B.2	Valley and foothill grassland. Alkaline soils, sometimes described as heavy white clay. 1-230m.	May-November annual herb	Nearest CNDDB (CDFW 2014) record is approx. 1.7 miles from site (EONDX #84649) from Harkins Slough Unit, Ellicott Slough National Wildlife Refuge.	Possible

Species Name	Common Name	Federal, State, & CNPS Listing[1]	Habitat Preferences & Distribution Information	Flowering Phenology/ Life Form	Habitat Suitability & Local Distribution	Potential For Occurrence
Erysimum ammophilum	sand-loving wallflower	1B.2	Occurs in sandy openings in chaparral (maritime), coastal dunes, and coastal scrub. Known from MNT, SBA, SCR, SDG, and SMT counties, and SRO between 0-60 m.	February-June perennial herb	No suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 1.8 miles from site (EONDX #10008) from Sunset State Beach, along Shell Rd., south of Sunset Beach Rd.	Not expected
Plagiobothrys chorisianus var. chorisianus	Choris' popcornflower	1B.2	Occurs on mesic sites in chaparral, coastal prairie, and coastal scrub (CNPS 2012) and in grassy moist places, ephemeral drainages, coastal scrub, and chaparral. It has been recorded as occurring in Alameda, Santa Cruz, San Francisco, and San Mateo but may be extirpated in Alameda Co. 15-160m.	March-June annual	Suitable vegetation associations present. Nearest CNDDB (CDFW 2014) record is approx. 2.7 miles from site (EONDX #57042) from Watsonville Municipal Airport.	Possible
Amsinckia lunaris	bent-flowered fiddleneck	1B.2	Occurs in coastal bluff scrub, cismontane woodland and valley and foothill grassland. Many collections are old. Known from ALA, CCA, COL, LAK, MRN, NAP, SCR, SMT and SON counties from 3-500m. May be present in SIS and SHA counties.	March-June annual herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Arctostaphylos andersonii	Anderson's manzanita	1B.2	** common name =Santa Cruz Manzanita in the Cloverdale Ranch Table. Occurs in openings and edges of broadleaved upland forest, chaparral, and North Coast coniferous forest. Known from SCL, SCR, and SMT counties between 60-730m.	November-April shrub (evergreen)	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected

Species Name	Common Name	Federal, State, & CNPS Listing[1]	Habitat Preferences & Distribution Information	Flowering Phenology/ Life Form	Habitat Suitability & Local Distribution	Potential For Occurrence
Arctostaphylos regismontana	Kings Mountain manzanita	1B.2	Occurs on granite or sandstone in broadleaved upland forest, chaparral, and North Coast coniferous forest. Plants north of Big Basin in SCR County look intermediate, identification uncertain. Known from SCL, SMT, and possibly SCR county between 305-730m.	January-April shrub (evergreen)	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Arctostaphylos silvicola	Bonny Doon manzanita	1B.2	Occurs in inland marine sands in closed-cone coniferous forest, chaparral, and lower montane coniferous forest. Known from SCR County between 120-600. Known from <20 occurrences.	February-March shrub (evergreen)	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Fissidens pauperculus	minute pocket moss	1B.2	North coast coniferous forest. Moss growing on damp soil along the coast. 10-100m.	moss	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Lessingia micradenia var. glabrata	smooth lessingia	1B.2	Chaparral. Serpentine; often on roadsides. 120-485m.	July-November annual herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Malacothamnus arcuatus	arcuate bush-mallow	1B.2	Occurs in chaparral. Known from SCL, SCR, and SMT counties between 15-355 meters. Chaparral. Gravelly alluvium. 80-355m.	April-September shrub (evergreen)	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Malacothamnus hallii	Hall's bush-mallow	1B.2	Chaparral. Some populations on serpentine. 10-550m.	May-October perennial evergreen shrub	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected

Species Name	Common Name	Federal, State, & CNPS Listing[1]	Habitat Preferences & Distribution Information	Flowering Phenology/ Life Form	Habitat Suitability & Local Distribution	Potential For Occurrence
Penstemon rattanii var. kleei	Santa Cruz Mountains beardtongue	1B.2	Occurs in chaparral, lower montane coniferous forest, and North Coast coniferous forest. Known from SCL and SCR counties between 400-1,100m. Known from <10 occurrences.	May-June perennial herb	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected
Rosa pinetorum	pine rose	1B.2	Occurs in closed-cone coniferous forest. Known from MNT and SCR counties between 2-300m. Possible hybrid of *R. spithamea, R. gymnocarpa,* or others; further study needed.	May-July shrub (deciduous)	No suitable vegetation associations present. No CNDDB (CDFW 2014) records from region.	Not expected

STATUS CODES:

FEDERAL

FE = Listed as Endangered by the USFWS

FT = Listed as Threatened by the USFWS

FC = Candidate for Federal listing

CALIFORNIA NATIVE PLANT SOCIETY (CNPS STATUS)

1A – Plants presumed extinct in California
1B – Plants rare, threatened, or endangered in California and elsewhere
2 – Plants rare, threatened, or endangered in California, but more common elsewhere
3 – Plants about which we need more information – a review list
4 – Plants of limited distribution – a watch list

STATE

CE = Listed as Endangered by the State of California

CT = Listed as Threatened by the State of California

CNPS THREAT CODE EXTENSIONS:

.1 -- Seriously endangered in California.
.2 -- Fairly endangered in California.
.3 -- Not very endangered in California

Table C-2. Special Status Wildlife Species with Potential to Occur in the Bryant-Habert Project Study Area

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Suitability & Local Distribution	Potential for Occurrence
Invertebrates					
Cicindela ohlone	Ohlone tiger beetle	FE	Found only on, and adjacent to, coastal prairie terrace habitat marked by poorly drained clay soils. Specific clay soils that provide moisture, composition, and temperature conditions necessary for egg-laying and larval development.	No suitable habitat present. No records from region.	Not expected
Coelus globosus	globose dune beetle	-	Inhabitant of coastal sand dune habitat, from Bodega Head in Sonoma county south to Ensenada, Mexico. Inhabits foredunes and sand hummocks; it burrows beneath the sand surface and is most common beneath dune vegetation.	No suitable habitat present. Two CNDDB (CDFW 2014) records within 5 miles of site, nearest is from Sunset State Beach, approx. 1.8 miles from project study area.	Not expected
Danaus plexippus	monarch butterfly	-	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	No suitable wintering habitat present. Nearest CNDDB (CDFW 2014) occurrence from Moss Landing Middle School; individuals were last observed at this location in 1994.	Not expected
Linderiella occidentalis	California linderiella	-	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity.	No suitable habitat present. No records within 5 miles of project study area.	Not expected
Tryonia imitator	mimic tryonia (=California brackishwater snail)	-	Inhabits coastal lagoons, estuaries and salt marshes, from Sonoma county south to San Diego county. Found only in permanently submerged areas in a variety of sediment types; able to withstand a wide range of salinities.	No permanently submerged habitat in project area. CNDDB (CDFW 2014) records indicate multiple occurrences within 5 miles of project study area; most from Elkhorn Slough area.	Not expected

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Suitability & Local Distribution	Potential for Occurrence
Fish					
Eucyclogobius newberryi	tidewater goby	FE, CSC, CH	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	Suitable habitat present, though Shell Road Pump Stations is significant barrier for inland migration (WSMP, 2003). One CNDDB (CDFW 2014) occurrence within 5 miles of site, from mouth of Pajaro River to 1 mile upstream. Known from lower Watsonville Slough.	Not expected
Oncorhynchus kisutch	coho salmon - central California coast ESU	FE, CH, SE, NMFS	Spawns in freshwater in areas with suitable spawning gravels; juveniles require cool, clean water, cover, and sufficient dissolved oxygen.	Shell Road Pump Station is significant barrier for inland migration (WSMP, 2003). No records from region.	Not expected
Oncorhynchus mykiss irideus	steelhead - central California coast DPS	FT, CH, NMFS	Spawns in freshwater in areas with suitable spawning gravels; juveniles require cool, clean water, cover, and sufficient dissolved oxygen.	Shell Road Pump Station is significant barrier for inland migration (WSMP, 2003). No records from region.	Not expected
Oncorhynchus mykiss irideus	steelhead - south/central California coast DPS	FT, CSC, NMFS	Spawns in freshwater in areas with suitable spawning gravels; juveniles require cool, clean water, cover, and sufficient dissolved oxygen.	Shell Road Pump Station is significant barrier for inland migration (WSMP, 2003). No records from region.	Not expected
Amphibians					
Ambystoma californiense	California tiger salamander	FT, CH, ST, CSC	Central valley DPS federally listed as threatened. Santa Barbara and Sonoma counties DPS federally listed as endangered. Need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	Numerous occurrences within 5 miles of project study area, most from Santa Cruz long-toed Salamander Ecological Reserve and Elkhorn Slough Reserve (CNDDB CDFW 2014). Nearest CNDDB (CDFW 2014) occurrence from 0.25 mile SW of junction of Highway 1 and Jensen Rd., approx. 3 miles from project study area. Study area lacks upland refugia for this species.	Not expected

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Suitability & Local Distribution	Potential for Occurrence
Ambystoma macrodactylum croceum	Santa Cruz long-toed salamander	FE, SE, FP	Wet meadows near sea level in a few restricted locales in Santa Cruz and Monterey counties. Aquatic larvae prefer shallow (<12 inches) water, using clumps of vegetation or debris for cover. Adults use mammal burrows.	Suitable habitat present in wet meadow. Multiple CNDDB (CDFW 2014) records within 5 miles of project study area, nearest are from McClusky Slough and Santa Cruz Long-Toed Salamander Ecological Reserve. Ellicott Pond in Ellicott Slough NWR supports a large salamander population (CNDDB CDFW 2014).	Possible
Rana boylii	foothill yellow-legged frog	CSC	Breeds in creeks and rivers; uses both creeks and stream banks to forage.	No suitable habitat present. Single CNDDB (CDFW 2014) record from region is a collection made in 1970, approx. 1.25 miles from the project study area.	Not expected
Rana draytonii	California red-legged frog	FT, CH, CSC	Lowlands or foothills in or near sources of water with shrubby or emergent riparian vegetation.	Suitable habitat present. Known to occur in West Branch Struve Slough, Hansen Slough, Harkins Slough, Middle Watsonville Slough, and CRLF and Chivos Pond (WSMP 2003). CNDDB (CDFW 2014) records indicate occurrences within the project study area, from pond leading Hanson Slough along the south side of the SPRR tracks, between Watsonville Slough and Beach Road.	Present
Reptiles					
Anniella pulchra nigra	black legless lizard	CSC	Sand dunes and sandy soils in the Monterey Bay and Morro Bay regions. Inhabit sandy soil/dune areas with bush lupine and mock heather as dominant plants. Moist soil is essential.	Species known to occur in the lower Pajaro River Lagoon and dunes (Hunt 1983; Bury 1985). No suitable dune habitat present in project site. Two records within 5 miles of site, both from 1984; location information for records is restricted.	Not expected
Anniella pulchra pulchra	silvery legless lizard	CSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. They prefer soils with a high moisture content.	No suitable habitat present. Species known from lower Pajaro River Lagoon and dunes (G. Kittleson pers. comm.).	Not expected

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Suitability & Local Distribution	Potential for Occurrence
Emys marmorata	western pond turtle	CSC	Permanent ponds and slow-moving streams and rivers with open areas for basking.	Suitable habitat present. Nearest CNDDB record from Pajaro River downstream from McGowan Rd. bridge, approx. 1 mile from project study area (CDFW 2014). Considered rare within Watsonville Slough system, though known to breed and occupy the Pajaro River (WSMP 2003).	Present
Birds					
Agelaius tricolor	tricolored blackbird	CSC	Open water, protected nesting substrate (blackberry/cattails), and foraging areas with insect prey.	Suitable habitat present. A nesting colony documented within 1-mile of the project study area is considered abandoned as of 4/30/1989 (CDFW 2014). No nesting records and few observations have documented elsewhere in the Watsonville Slough system (WSMP 2003) however species present on Watsonville Slough Farms in winter 2013-2014 (G. Kittleson pers. comm.)	Possible
Asio flammeus	short-eared owl	CSC	Inhabits open grasslands, prairies, marshes and agricultural fields with commaicient cover and abundant small mammal prey. Nests on the ground in a shallow depression. Breeding begins in April.	Suitable habitat present. Known to winter in uplands near Harkins, Hanson, Struve, and West Struve Sloughs (WSMP 2003). Observed in project study area in 2013 (G. Kittleson pers. comm.)	Ppossible (winter visitor)
Athene cunicularia	Western burrowing owl	CSC	Valley bottoms and foothills with low vegetation and fossorial mammal activity.	Suitable habitat along rail line and in uplands with ground squirrel burrows. CNDDB (CDFW 2014) occurrence record of a wintering site near south side of Giberson Rd., 2 miles NE of the mouth of Elkhorn Slough, approx. 4.8 miles from project study area. One individual observed along rail line in project study area in October 2013 (G. Kittleson pers. comm.).	Possible

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Suitability & Local Distribution	Potential for Occurrence
Brachyramphus marmoratus	marbled murrelet	FT, SE	Mature, coastal coniferous forests for nesting; nearby coastal water for foraging; nests in conifer stands greater than 150 years old and may be found up to 35 miles inland; winters on subtidal and pelagic waters often well offshore. Nests from mid-April to late September. Known to breed in Santa Cruz Co.	No suitable habitat present. No records from region.	Not Expected
Charadrius alexandrinus nivosus	western snowy plover	FT, CH, CSC	Inhabit coastal beaches above the normal high-tide limit in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent.	Suitable wintering habitat present. Nearest CNDDB (2013) occurrence record from Pajaro River mouth and Palm Beach, approx. 2 miles from project study area. WSMP (2003) indicates nesting sites occur near confluence of Watsonville Slough and Pajaro River.	Not expected
Elanus leucurus	white-tailed kite	FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Suitable habitat present. WSMP (2003) indicates nesting has been documented in association with all of the Sloughs. Nests documented in 2013 from Hanson Slough and Struve Slough (G. Kittleson pers. comm.).	Possible
Haliaeetus leucocephalus	bald eagle	DL, SE	In western North America, nests and roosts in coniferous forests within 1 mile of a lake, reservoir, stream, or the ocean.	Suitable habitat present. Expected to occur in the project area as a rare, year-round resident. A nesting pair has been documented from Gallighan Slough near the confluence with Harkins Slough.	Possible
Pandion haliaetus	osprey	WL	Ocean shore, bays, fresh-water lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	Suitable foraging habitat present. Most frequently reported from the Pajaro River mouth, lower Watsonville and Harkins Sloughs (2003). Documented nesting at Harkins Slough since 2007 and in Hanson Slough in WSF (G. Kittleson pers. comm.).	Possible

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Suitability & Local Distribution	Potential for Occurrence
Rallus longirostris obsoletus	California clapper rail	FE, SE, FP	Salt-water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco bay. Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	No CNDDB (CDFW 2014) records within 5 miles of project study area; nearest record from Elkhorn Slough area, 1978.	Not expected
Riparia riparia	bank swallow	ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	No suitable nesting habitat present. Nearest CNDDB (CDFW 2014) record is for a nesting colony located at mouth of Pajaro River near Bluff Rd. and Trafton Rd, approx. 2 miles from the project study area, the record indicates this colony no longer active.	Not expected
Sternula antillarum (=Sterna, =albifrons) browni	California least tern	FE, SE	Nearshore beaches with bare or sparse vegetation, including sandy beaches, alkali flats, paved areas or landfills. Salt marshes.	No suitable habitat present. No records from region.	Not expected
Icteria virens	yellow breasted chat	CSC	Nesting Yellow-breasted Chats occupy early successional riparian habitats with a well-developed shrub layer and an open canopy. Vegetation structure, however, more than age appears to be the important factor in nest-site selection (Shuford and Gardali 2008).	Not known from the project area. Suitable habitat present in willow thickets and riparian (blackberry) vegetation within project site. A recent record from Pajaro River near San Mateo / San Benito county line (G. Kittleson pers. comm.) Considered an occasional nesting species, but largely a rare migrant (Suddjian et al. 2007; Suddjian 1996). Migrants have been observed at College Lake (eBird.org).	Not expected
Setophaga petechia	yellow warbler	CSC	Yellow Warblers breed in shrubby thickets and woods, particularly along watercourses and in wetlands. Common trees include willows, alders, and cottonwoods across North America and up to about 9,000 feet in the West.	Breeding season observations are common in Watsonville Slough riparian habitats, though not documented from project site (G. Kittleson pers. comm.)	Possible

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Suitability & Local Distribution	Potential for Occurrence
Vireo bellii pusillus	Least Bell's vireo	FE, SE	Found in dense brush, mesquite, willow-cottonwood forest, streamside thickets, and scrub oak, in arid regions, often near water; moist woodland, bottomlands, woodland edge, scattered cover and hedgerows in cultivated areas, brush in winter.	Suitable foraging habitat present. No records from region.	Not Expected
Mammals					
Antrozous pallidus	pallid bat	CSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect from high temperatures. Sensitive to disturbance of roosting sites.	No suitable habitat present. No records within 5 miles of project study area.	Not expected
Dipodomys venustus venustus	Santa Cruz kangaroo rat	-	Silverleaf manzanita mixed chaparral in the Zayante Sand Hills of the Santa Cruz Mountains. Needs soft, well-drained sand.	No suitable habitat present. No records from region.	Not expected
Neotoma fuscipes annectens	San Francisco dusky-footed wood rat	CSC	Deciduous woodlands, scrubs, and thickets.	Suitable habitat present in willow thickets and species is known to inhabit banks of Pajaro River south of the site. No woodrat houses have been observed in the project site (G. Kittleson pers. comm.).	Possible
Reithrodontomys megalotis distichlis	Salinas harvest mouse	-	Known only from the Monterey Bay region. Occurs in fresh and brackish water wetlands and probably in the adjacent uplands around the mouth of the Salinas River.	Project area is outside of known range. No records within 5 miles of project study area. Single CNDDB (CDFW 2014) occurrence in region from Strawberry Canyon, 1927.	Not expected
Taxidea taxus	American badger	CSC	Open areas with friable soils within woodland, grassland, savannah and desert habitats.	No suitable habitat present. Single CNDDB (CDFW 2014) occurrence in region is collection made in 1909, Aptos, approx. 2.7 miles from project study area.	Not expected

Scientific Name	Common Name	Listing Status[1]	Habitat Requirements	Habitat Suitability & Local Distribution	Potential for Occurrence
Vulpes macrotis mutica	San Joaquin kit fox	FE, ST	Annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base.	No suitable habitat present. No records from region.	Not expected

EXPLANATION OF STATE AND FEDERAL LISTING CODES:

FEDERAL

FE = Federally listed as Endagered

FT = Federally listed as Threatened

FPE = Candidate for Federal listing

DL = Delisted

FPD = Federally proposed for delisting

FC = Federal candidate species (former Category 1 candidates)

SC = Species of Concern (NMFS regulated species only)

CH = Critical Habitat (Proposed or Final) is designated

STATE

SE = State listed as Endangered

ST = State listed as Threatened

SR = State listed as Rare

SCE = State candidate for listing as Endangered

SCT = State candidate for listing as Threatened

CSC = California Species of Special Concern

FP = Fully Protected

WL = Watch List

Attachment 5

California Red-legged Frogs at the Watsonville Slough Farm
Results of 2013-14 Field Surveys

June 2014

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California Red-legged Frogs at the Watsonville Slough Farm

Results of 2013-2014
Field Surveys

Prepared for the
Land Trust of
Santa Cruz County

June 2014

Kittleson Environmental Consulting

Introduction

The Federally-Threatened California red-legged frog (*Rana arora draytonii, or CRF)* was once common throughout much of lowland California. Loss of habitat and the introduction of aquatic predators, including bullfrogs and non-native fish, have drastically reduced populations of this species throughout its range. (61 Federal Register 25813). The California red-legged frog is known to occur in the Watsonville Slough System and portions of the Watsonville Sloughs have been mapped by the US Fish and Wildlife Service as Critical Habitat for the species (66 Federal Register 14626). The Watsonville Slough Farm (WSF) property is within the mapped Critical Habitat for the California red-legged frog (Unit SCZ-2). Figure 1.

California red-legged frogs inhabit a wide range of aquatic habitats including creeks, streams, and ponds that have perennial or near perennial standing water. Breeding sites include streams, deep pools, backwaters within streams and creeks, ponds, marshes, sag ponds, dune ponds, lagoons, and artificial impoundments such as stock ponds with emergent vegetation. Preferred habitats have water 2 to 3 feet deep with dense emergent or shoreline vegetation. CRF breed during the rainy season and may move through upland habitats up to two miles between non-breeding and breeding sites (Bulger 1999).

Over the past century changes in land use and hydrologic conditions throughout the Watsonville Sloughs and lower Pajaro Valley have resulted in significant modifications to the wetland habitats capable of supporting the California red-legged frog. The conversion of upland habitats for urban development and agriculture has also impinged and isolated the remnant wetland and riparian habitats in the slough system. While California red-legged frogs are present in the slough system, the size and distribution of the local CRF population, as well as it's site-specific life history, are poorly understood.

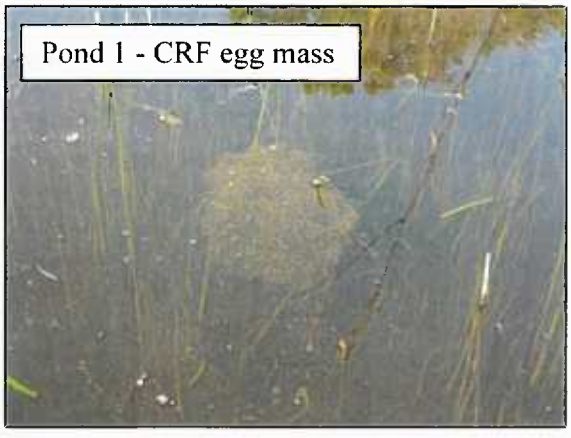
To develop a greater understanding of the specie's local status, and its potential for recovery, Biologists Gary Kittleson of Kittleson Environmental Consulting (KEC), Bryan Mori of Bryan Mori Biological Consulting Services (BM) and Mark Allaback of Biosearch Associates (BA) were retained by the Land Trust of Santa Cruz County in 2013 to conduct focused CRF surveys in suitable habitats at the Watsonville Slough Farm and vicinity. The following report summarizes and maps the results of those surveys and compiles other available CRF and pertinent historical data to support the Land Trust of Santa Cruz County's habitat restoration planning and land management decision-making.

California Red-legged Frog Life History and Regulatory Status

The California red-legged is the largest native frog in California (85-138 mm) and was historically widely distributed in the central and southern portions of the state (Jennings & Hayes 1994). The species requires still or slow-moving water for successful breeding to deposit large egg masses, usually attached to submergent or emergent vegetation. Each female typically deposits 1 to 3 egg masses for each mating occurrence. Breeding typically occurs between December and April, depending on site hydrologic conditions. Seasonal ponds that dry by late summer and perennial ponds without significant predation pressure by bullfrogs and fish appear to be the most successful breeding areas.

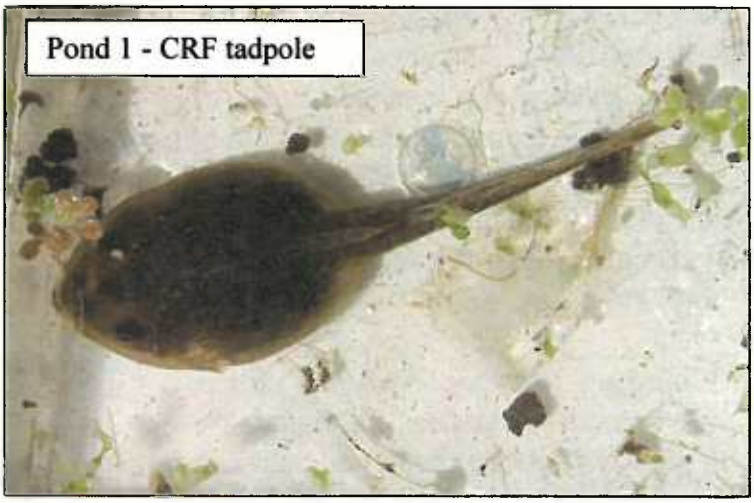

Pond 2 - Adult CRF

Adults generally inhabit aquatic habitats with riparian vegetation, overhanging banks or plunge pools for cover, especially during the breeding season (Hayes and Jennings 1988). They may take refuge in small mammal burrows, leaf litter or other moist areas during periods of inactivity or to avoid desiccation in dry periods (Rathbun, *et al.* 1993; Jennings and Hayes 1994). Red-legged frogs may move up to 300 feet from aquatic habitats into surrounding uplands, especially following rains, when individuals may spend days or weeks in upland habitats (Bulger 1999). Radio-telemetry studies indicate that adult CRF may travel significant distances in straight-line breeding season movements across varied terrain, moving up to 2 miles between non-breeding and breeding sites (Bulger 1999). In the Watsonville Sloughs they are most often observed in open water with emergent wetland vegetation, on banks, or upland with 20 feet of open water (KEC, pers. obs.).

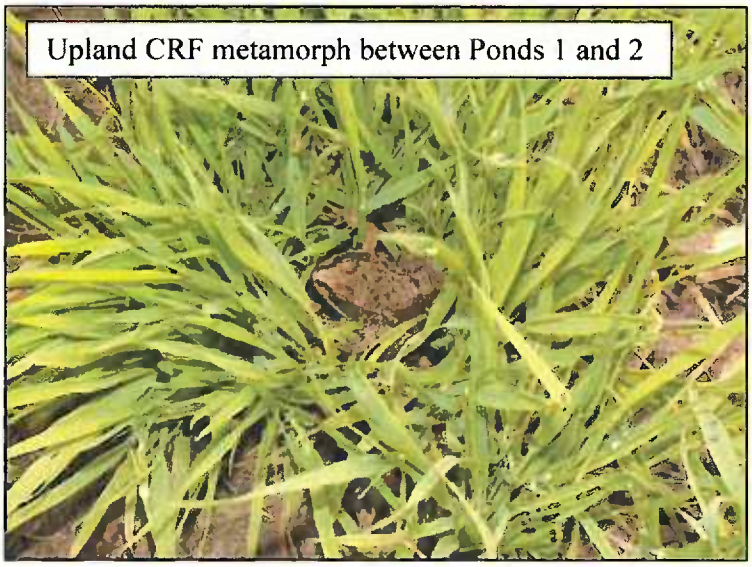

Pond 1 - CRF egg mass

Eggs require 6 to 12 days before hatching and metamorphosis generally occurs 3.5 to 7 months after hatching, although larvae (*tadpoles*) are capable of over-wintering in perennial waters. Metamorphosis (*growth of legs, loss of tail*) generally occurs between July and September and results in juveniles that are 25-35 mm in size. Movements and habitat associations of juveniles are not well understood. They have been found in low

numbers in both wetlands and nearby uplands at the WSF Farm and Middle Watsonville Slough channel (KEC, pers. obs.).


Pond 1 - CRF tadpole

During the non-breeding season, a wider variety of aquatic habitats are used by California red-legged frogs, including small pools in coastal streams, springs, water traps and other ephemeral water bodies (Bulger, pers. comm.; pers. obs.). Occurrence of this frog has been shown to be negatively correlated with presence of non-native bullfrogs (Moyle 1973; Hayes & Jennings 1986, 1988), although both species are able to persist at certain locations, particularly in the coastal zone (pers. obs.; Allaback, pers. comm.). It is estimated that the California red-legged frog has disappeared from approximately 75% of its former range, and has nearly been extirpated from the Sierra Nevada, Central Valley and much of southern California (Miller, *et. al.* 1996).


Upland CRF metamorph between Ponds 1 and 2

On 23 May 1996, the California red-legged frog was listed as threatened by the United States Fish and Wildlife Service (Miller, *et. al.* 1996). The USFWS proposed critical habitat for red-legged frog on 11 September 2000 (McCasland and Twedt 2000). On 13 March 2001, the final determination of critical habitat was made (McCasland, *et al.* 2001). The project site is within an area designated as Critical Habitat.

California Red-legged Frog Surveys at the Watsonville Slough Farm and Vicinity

California red-legged frog is known to occur in the Watsonville Slough system and on the Watsonville Slough Farm property, although documented observation records are limited in number and extend back less than 25 years. The species was first documented in the area in 1990 when more than 10 adults were observed in the East Branch of Hansons Slough during development related biological inventories. (CNDDB 2012) In 1999, 10 subadults were documented on the property south of the Bryant-Habert parcel in the agricultural ditch next to the railroad tracks, and one dead adult CRF was found at the Harkins Slough railroad crossing (CNDDB 2012). Upstream, or east, of State Highway 1 two CRF were observed in 2001 in Struve Slough near Tarplant Hill during pre-development surveys and one adult CRF was observed in 2004 in Watsonville Slough at the Harkins Slough Road crossing near Ramsey Park prior to bridge construction (CNDDB 2012).

With the start of the three major Harkins Slough Road bridge construction projects from 2004-2007 at West Branch Struve Slough, Watsonville Slough, and Struve Slough, focused CRF monitoring commenced in the Slough system. For the County of Santa Cruz and the City of Watsonville, biologists Gary Kittleson of Kittleson Environmental Consulting (KEC), Bryan Mori of Bryan Mori Biological Consulting Services (BM) and Mark Allaback of Biosearch Associates (BA) conducted summer season CRF presence/absence surveys and daily monitoring for the three slough-crossing bridges on Harkins Slough Road.

During that period, no CRF were observed in the urban sloughs upstream of Highway 1 (KEC, pers. obs.). Subsequent CRF surveys done since 2008 for the City of Watsonville's Manabe Wetland Restoration Project on Watsonville Slough and for the bridge projects' 5-year mitigation monitoring plans resulted in no CRF observations in the now-developed parts of Watsonville or Struve Sloughs upstream of Highway 1.

Before Pajaro Valley High School and associated slough bridge were completed, the crossing at West Branch Struve Slough was a known summering location for CRF where they could easily be observed basking on the slough banks and in the flooded willows. In 2004, during bridge construction, 15 CRF were relocated from that location to other spots in West Branch Struve Slough (1.2 miles from the project site). In 2005, 12 CRF were relocated from the Lee Road crossing during installation of a PVHS-related temporary access bridge (0.75 mi. upstream from the WSF). Since bridge and school construction CRF observations at that site have ceased. (KEC, pers. obs.) The last CRF observed at that location was in 2009.

With authorization from USFWS breeding season surveys at the Watsonville Slough Farms and Bryant-Habert property began in 2007 by KEC, BA and BM. Initially, two agricultural ponds near the WSF barns were sampled do to the proximity to previous CNDDB records and the suitability of the habitat. The lower pond (Pond 1) was found to support small numbers of egg masses (1-2) and CRF larvae (<5) each year in 2007 and 2008. These man-made ponds were developed in approximately 1981 and have since become known as the "breeding ponds." The initial research efforts at WSF were initiated and funded by KEC.

Since 2008 scattered, non-breeding season observations of adults, sub adults and metamorph CRF have been made in the WSF breeding ponds and the nearby Watsonville Slough ditch, the adjacent riparian willow stand and the railroad crossing culverts.

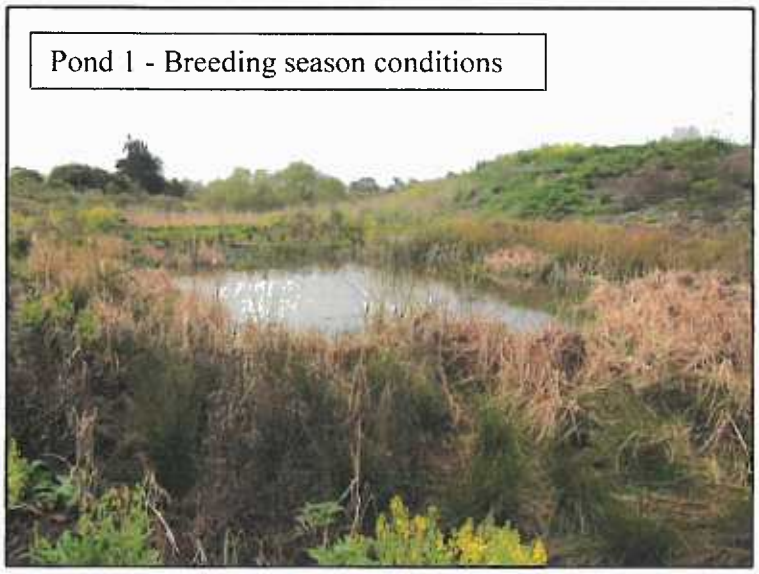
Following acquisition of the WSF by LTSCC and development of the Watsonville Slough Farms Management Plan, USFWS Protocol CRF surveys were conducted during winter and early spring of 2013. At that time the KEC team conducted CRF breeding season night surveys and daytime egg mass surveys at the Watsonville Slough Farms and Bryant-Habert property, including a portion of lower Harkins Slough.

In 2013, a total of six nocturnal CRF surveys were conducted by Gary Kittleson, Bryan Mori and Mark Allaback on 21 January; 4,13,18,and 26 February; and 14 March. Night surveys were done by kayak and on foot, throughout all readily accessible parts of the project area. Areas visited on the Watsonville Slough Farm and Bryant-Habert property include Chivos Pond, Upper Hansen Slough, Middle Watsonville Slough and the willow riparian habitat at the SPRR culvert crossing. Lower Harkins Slough and the wetland habitats along the rail line were also covered by the night surveys and resulted in several observations of CRF breeding activity. Survey routes and site names are presented in Figure 2.

Breeding activity (day-time calls, but no night calls from adult males) was confirmed at the two established frog ponds on the Watsonville Slough Farm property early in the 2013 winter and small numbers (1-3) CRF adults were observed at those ponds throughout 2013. Multiple observations of CRLF breeding activity (calling frogs, night observations) were detected in the main Bryant-Habert/Watsonville Slough ditch line at the railroad crossing, and throughout lower Harkins Slough and the middle Watsonville Slough area.

Rigorous breeding season surveys were also conducted in accessible parts of Hanson Slough, including Chivos Pond and the upper east branch of Hanson

Slough. Very limited 2013 CRLF breeding season activity was detected in those areas, with a only 3 visual observations of adult frogs and only one instance of nocturnal calling in the upper west branch of Hansons Slough. Figure 3


Pond 1 - Breeding season conditions

The two established frog breeding ponds (Ponds 1 & 2) on the Watsonville Slough Farm property provide suitable breeding habitat for California Red-legged frog in most years. Breeding activity has also been confirmed in the main Bryant-Habert/Watsonville Slough ditch line at the railroad crossing and in Middle Watsonville Slough, adjacent to the proposed Bryant-Habert Habitat Restoration Project site. Breeding activity (night calling) has been documented, but successful breeding has not been confirmed in Lower Harkins Slough and the Harkins Slough wetland habitats along the rail line. During 2013 night surveys a single adult male was also heard calling in the upper east branch of Hanson Slough, but no egg masses or larvae were subsequently detected.

Focused egg mass surveys were conducted in areas confirmed breeding activity by the team on 12 February and 13 March, 2013. Periodic, daytime surveys were conducted by KEC and Biosearch during March and April to check pond and slough water levels, in anticipation of aquatic sampling for larval stage frogs later in May and June 2013.


Pond 1 - Typically dry by July/August

Dense aquatic, submerged vegetation and persistent turbidity limited visibility in the main portions of Middle Watsonville Slough, Upper Hanson Slough and lower Harkins

Slough. Only one egg mass was observed in the original breeding pond, on 7 February, 2013 and no other egg masses were detected in any of the day time efforts.

The lack of successful CRF breeding throughout the project area, despite the extensive habitat available, is shown by the low number of egg masses encountered in areas where adult males were heard actively calling during night surveys. 2013 and 2014 spring egg mass surveys conducted by the KEC team covered nearly 40 acres of suitable CRF breeding habitat and a total of only two (2) egg masses were observed.

KEC conducted a night survey on 22 January 2014 and detected two adult frogs calling in the Watsonville Slough channel at the railroad crossing. On 12 and 13 March, 2014, the KEC team did egg mass surveys at the established frog and sediment ponds, lower Harkins Slough, Middle Watsonville Slough and Hansons Slough. Visibility was not poor due to willow pollen, duckweed, and mosquito fern on the water's surface.

The team saw only 1 confirmed subadult red-legged frog in the B-H ditch reach of Watsonville Slough and very low numbers of bullfrogs in the 2014 surveys. The existing breeding ponds by the barn had no CRF or bullfrogs. Chivos Pond and Hansons Slough had no evidence of CRF breeding in 2014. The newly built pond on Hansons Slough is very leaky and was too dry to support CRF breeding in 2014. The other sediment ponds on the farm also held no CRF or egg masses.

The one lone red-legged frog egg mass that was located in 2014 was in the center of Middle Watsonville Slough, at the point of confluence with Hansons. It was right in the dead center of the contiguous open water habitat, where we had many adults calling in 2013. There were six large carp present where the egg mass was located. Fewer than previous years, following the drought-related fish die-off of fall 2013, but still present and a potential problem. Figure 4.

Throughout the study period, however, summer season observations of small numbers of adult and sub-adult California red-legged frogs have been documented from Chivos Pond, the breeding pond complex, the railroad crossing culverts and in the the Watsonville Slough ditch and willow stands upstream of the railroad crossing. (KEC pers. obs.) Figure 5.

Bullfrog (*Rana catesbeiana*) and tree frog (*Pseudacris regilla*) larvae are known to be present in Chivos Pond, Middle Watsonville Slough (especially the B-H ditch line), Harkins and Hansons Slough, and are now consistently present in the established California red-legged frog breeding ponds. Predatory fish species that are known to be present in the study area include non-native carp (*Cyprinuscarpio*), brown bullhead

(*Ictalurus nebulosus*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*) and Native Sacramento blackfish (*Orthodon microlepidotus*) (KEC 2012). The constant presence of significant number of potential avian predators like herons, white pelicans and egrets may also affect the reproductive success of CRF in the slough system.

Elsewhere in the lower Pajaro Valley, CRF have been observed at 19 distinct locations in the Pajaro River downstream of Murphy Crossing since 2009. They are also known from Ellicott Slough (3.0) mi. northwest of the project site, the headwaters of Corralitos Creek at Grizzly Flat (10 mi. north) and the Elkhorn Slough system to the south. Eight confirmed breeding locations are within the general area, with four on the Monterey County side at the Salinas Road pond complex and along the Trafton Road ditch system and four on the Santa Cruz County side at the breeding ponds at the Land Trust of Santa Cruz County Watsonville Slough Farm, the Watsonville Slough channel at the railroad crossing and Middle Watsonville Slough. Figures 6 & 7.

A full account of confirmed CRF observations made by KEC in the Watsonville Slough Farms project area is included as Appendix A. Unconfirmed reports and observations of frogs that could not be photographed or positively verified by visual confirmation of CRF field marks are not included.

Discussion

In general, 2013 CRF breeding season detections were widely distributed in both geographic scope and the total numbers of individual frogs heard calling at night. By comparison, few red-legged were visually observed during field searches, even at night when they were heard calling.

The most notable CRF observations made in the 2013 season were the large numbers of adult frogs attempting to breed in the open waters of middle Watsonville and lower Harkins Slough. The peak night for audible calls was 18 February, when 5-7 adults were heard in lower Harkins Slough and 25-30 frogs were heard calling in middle Watsonville Slough. Previous night surveys by KEC in 2009, 2010, and 2011 found low numbers of CRF in middle Watsonville Slough only in the flooded willows near the railroad crossings and in the breeding ponds, upslope.

Adult and sub adult CRLF were not seen within Chivos Pond during the 2013 or 2014 breeding season surveys, although they were observed in late January and early February 2013 close by in the main arm of Hanson's Slough.

Bullfrog (*Rana catesbeiana*) and tree frog (*Pseudacris regilla)* are present throughout the study area in Chivos Pond, Middle Watsonville Slough (especially the B-H ditch line), Harkins and Hansons Slough. Bullfrogs and tree frogs are now consistently present in the established CRF breeding ponds, as well.

CRF breeding activity in open water areas of the sloughs, though suitable for depth and vegetated cover, was previously undetected. The lack of visible egg masses in follow-up 2013 surveys was perplexing. The discovery of one single egg mass in middle Watsonville Slough in 2014 showed that breeding by CRF is being attempted, albeit with little to no success. The documented presence of predatory fish (carp, bass, bluegill, bullhead, and Sacramento blackfish) in those areas represent a significant potential impact to CRF breeding success and may explain the lack of egg masses and tadpoles in the main sloughs' contiguous open water areas.

The development of a robust warm-water, and largely non-native, fishery in the sloughs coincides with the large-scale industrial extraction of peat soils from Harkins Slough in the early 1980's and the recent trend towards persistent deep water habitats in formerly seasonal emergent marsh wetlands and low-lying agricultural fields. Prior to the conversion of middle Harkins Slough to a perennial lake, small scale peat harvesting was done in Gallighan Slough and in the east branch of Hansons Slough near Lee Road.

Appendix B provides a collection of historic soils maps and aerial photos that illustrate the conversion of the slough bottomlands from row crop agriculture to peat mining. Evidence of peat mining in Hanson Slough is seen in the 1963 image and in Harkins Slough in the 1987 and 1992 images. Appendix C is an Register-Pajaronian article from 1983 that describes the peat operation plans and the controversial process by which it was approved and ultimately acquired by the California Department of Fish and Game.

The presence of deep peat pits up to 12 feet deep in the slough system provides refugia for the non-native fish species, even during extreme drought. During flood periods, carp have been observed spawning throughout accessible shallow water habitat, emergent wetland habitat that could support CRF breeding and egg masses.

The B-H/Watsonville Slough ditch at and above the railroad culverts has been the most consistent location for CRF observations throughout the KEC study period and it appears to have been a successful breeding location in 2013. This location had 2 calling adults in 2014, but no egg masses were seen during subsequent egg mass surveys. This location has water all year and was the location of the only drought-period CRF adults observed on this side of the Pajaro River in 2014.

On the Monterey County side of the Pajaro River the small coastal watershed that flows to the Pajaro Lagoon, known as the Bolsa de Cayetano, and the man-made ponds near the Salinas Road interchange produce an exponentially larger number of frogs than similar habitats in the Watsonville Sloughs. There is not comparable CRF data on that area yet, but initial observations made by KEC since 2011 during other studies indicate significantly higher numbers in several locations along Trafton Road throughout the Monterey County side of the Lower Pajaro River watershed.

The connectivity to the sloughs via the Pajaro Lagoon and agricultural ditches makes this the most likely population center. There has been no evidence of breeding in the Pajaro River, itself, but CRF have been seen in multiple locations on the Monterey County side in the connecting agricultural ditches between Trafton Road and the River.

Within the Watsonville Slough Farm study area, the amount of available, suitable habitat for CRF eggs is large (approximately 40 acres), and both the adult frog and egg mass numbers are extremely low, relative to that area. The KEC team found no large or productive breeding sites in the sloughs, to date. In general, the area appears to be a small, self-sustaining population, with widely distributed breeding attempts, but little real success. Future recovery efforts should focus on development of breeding habitats where fish are excluded.

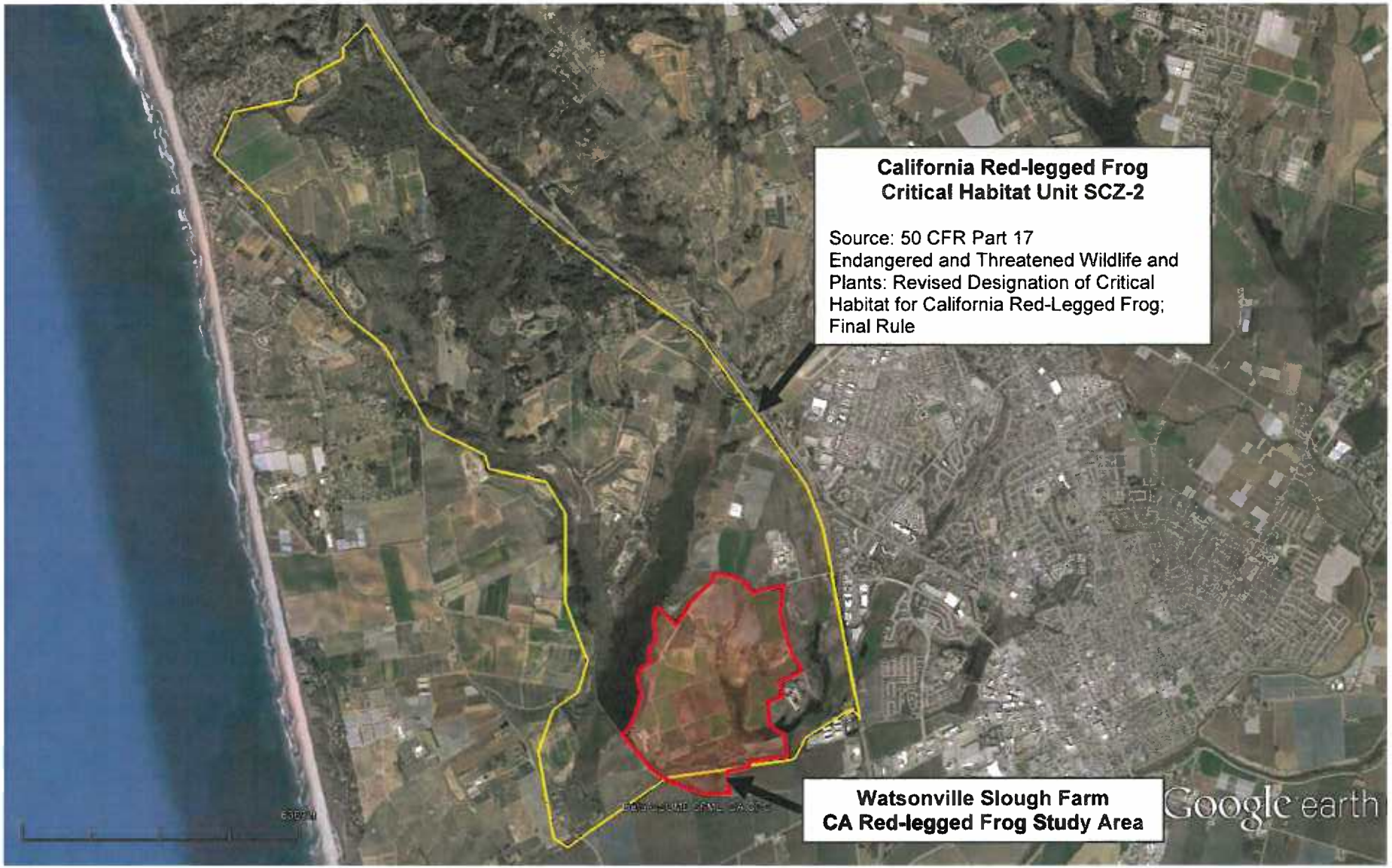


Figure 1. California Red-legged Frog Critical Habitat Unit SCZ-2 and Watsonville Slough Farm Study Area

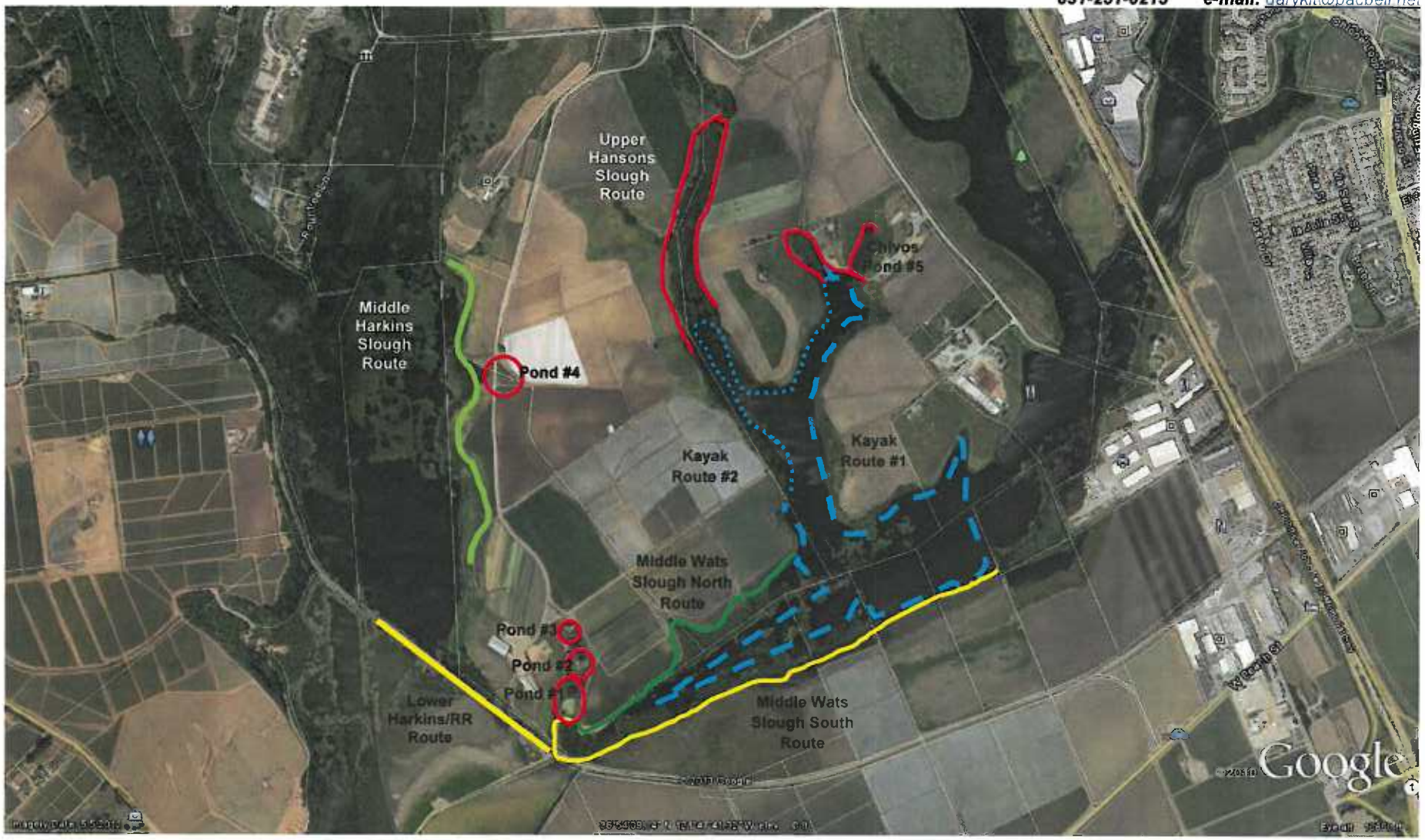


Figure 2. Night survey routes January - March 2013. Kayak routes (blue) and walking transects are shown.

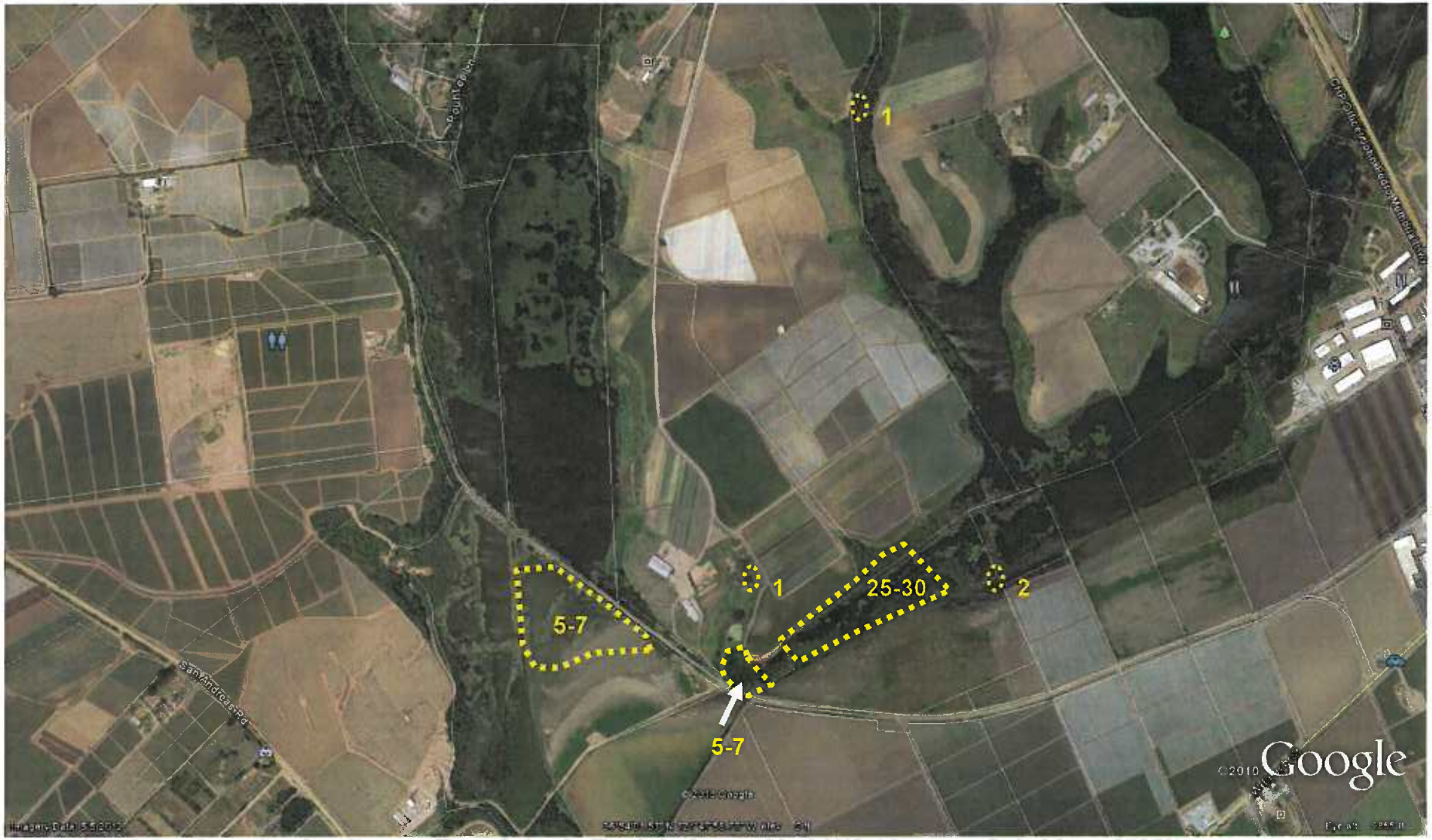


Figure 3. Locations and number of breeding CRF adults heard calling during January - March 2013 night surveys. Peak night was 2/18/2013. Frogs were audible and observed in emergent marsh, submerged willows, shallow open water and burreed edge habitats.

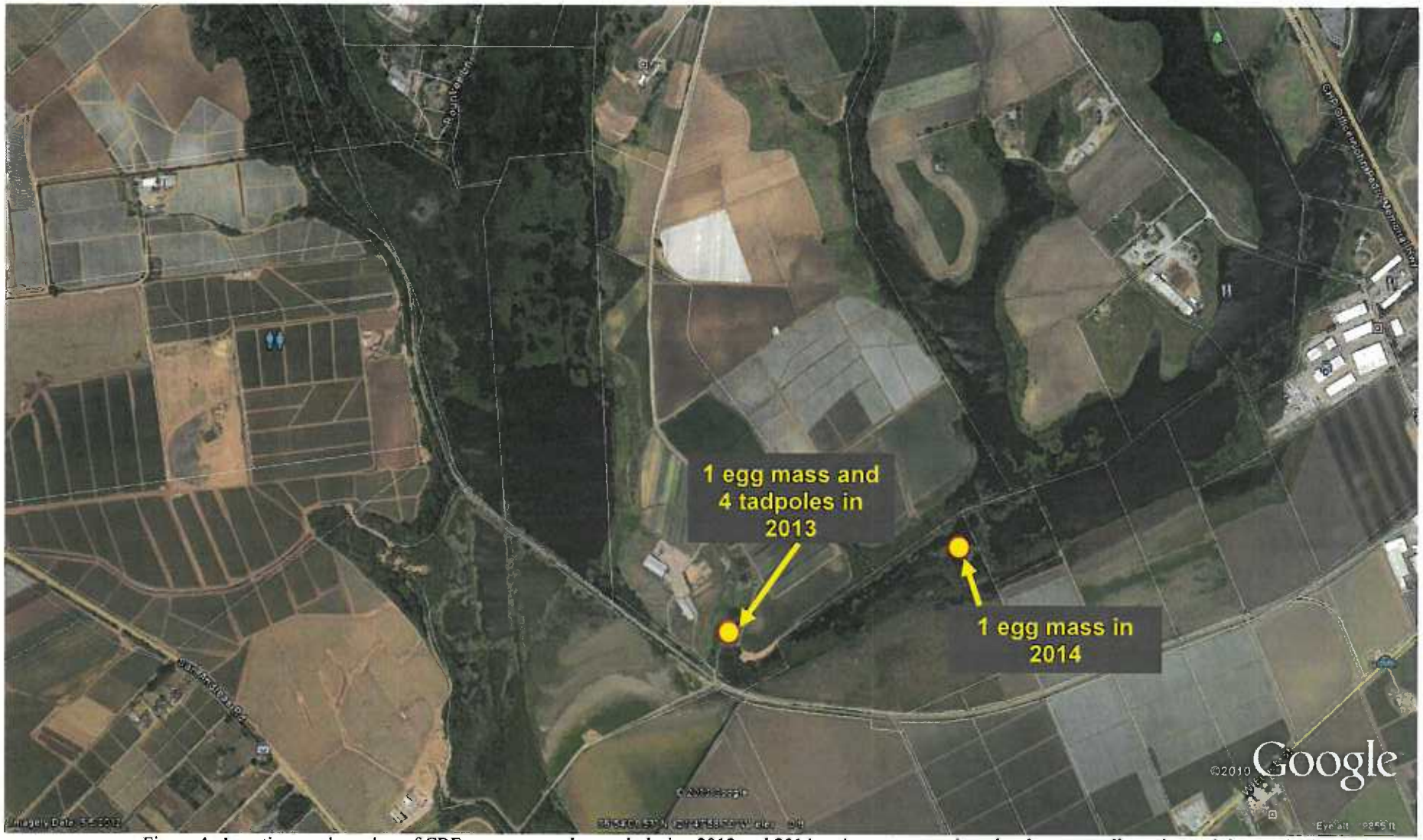


Figure 4. Locations and number of CRF egg masses observed during 2013 and 2014 spring surveys using visual surveys, dipnetting, seining, and minnow traps.

Figure 5. Locations of summering CRF observed during 2013 and 2014 daytime visual surveys.

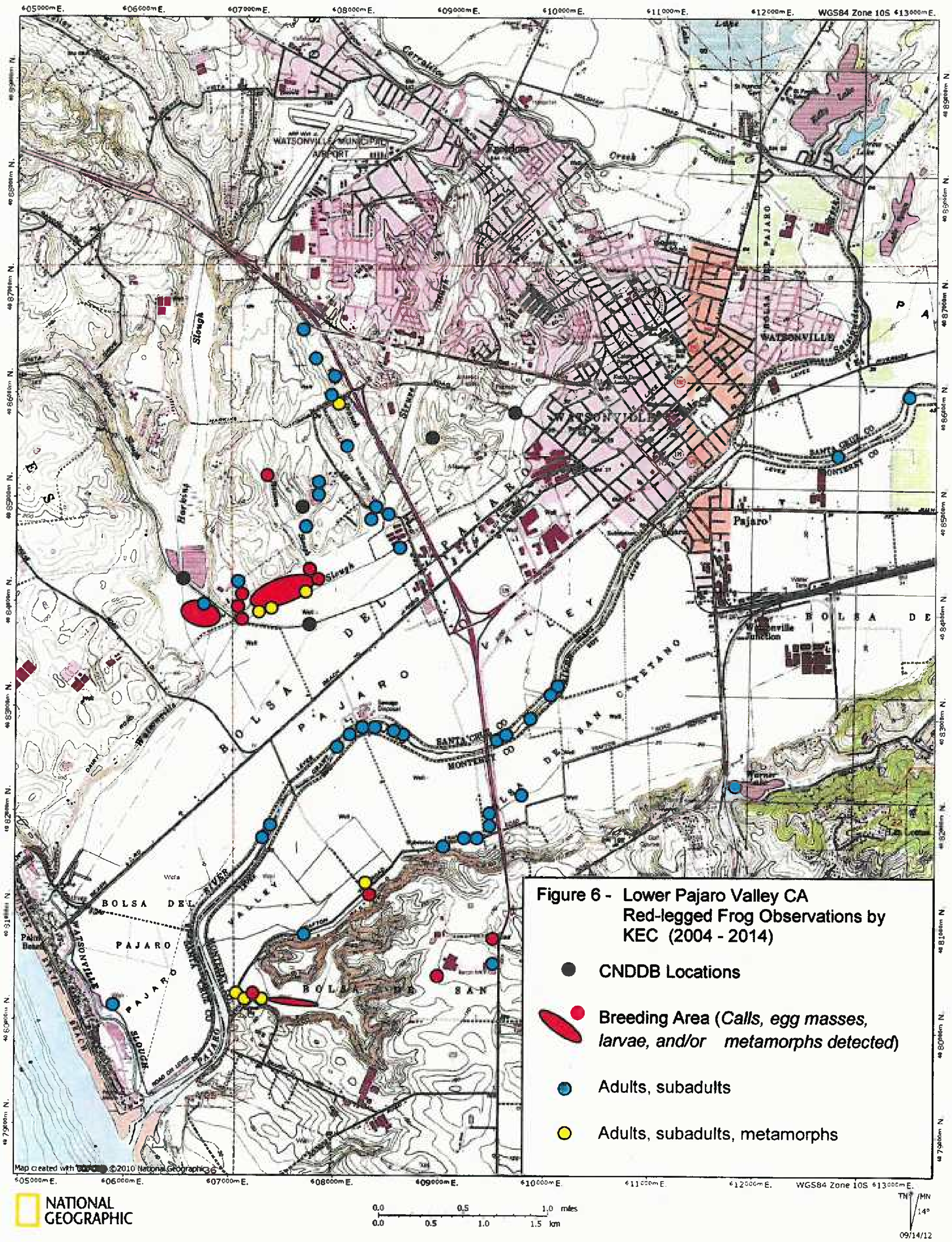


Figure 6 - Lower Pajaro Valley CA Red-legged Frog Observations by KEC (2004 - 2014)

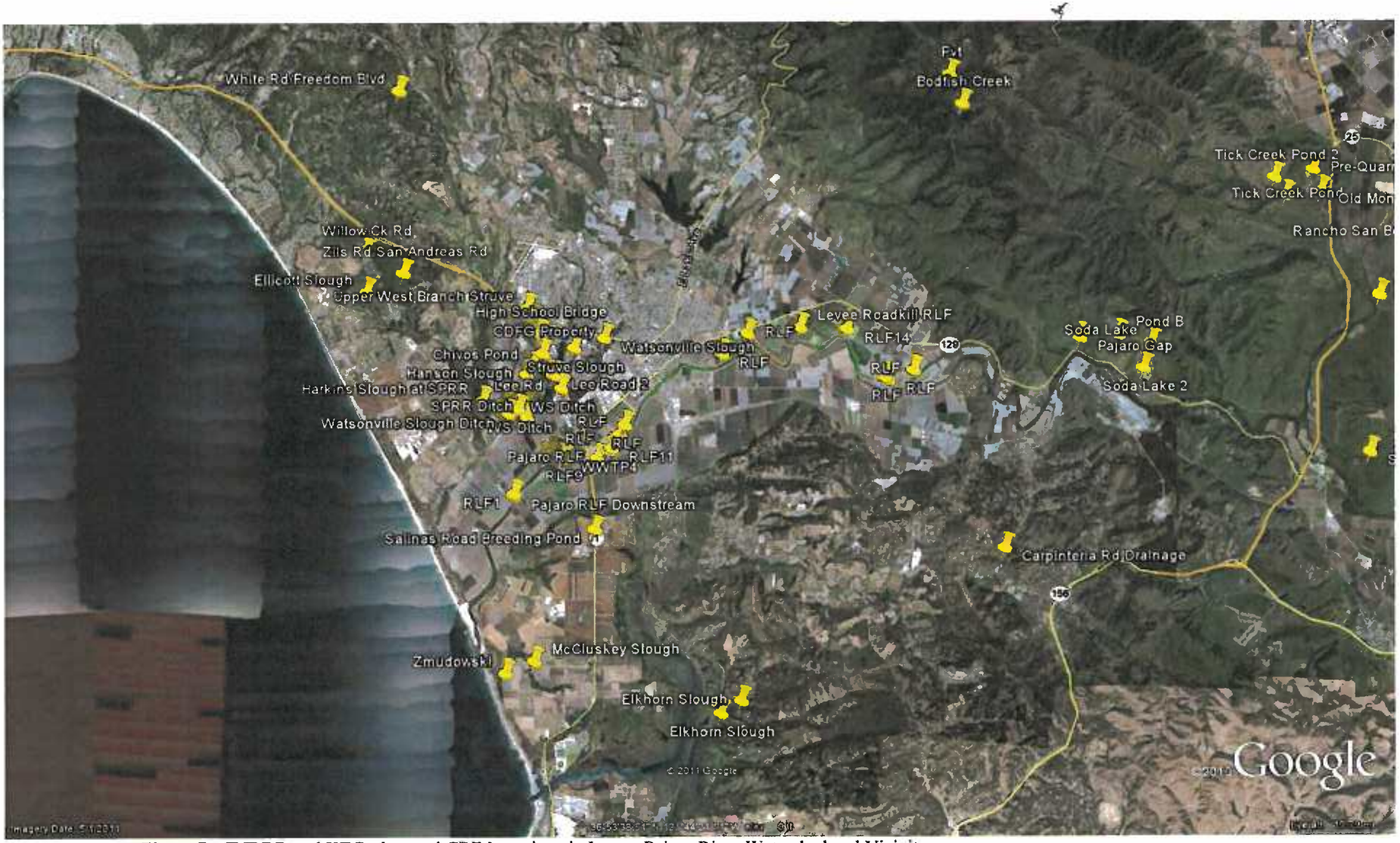


Figure 7. CNDDB and KEC-observed CRF Locations in Lower Pajaro River Watershed and Vicinity.

APPENDIX A: Confirmed California Red-legged Frog Observations at the Watsonville Slough Farm Since 2006

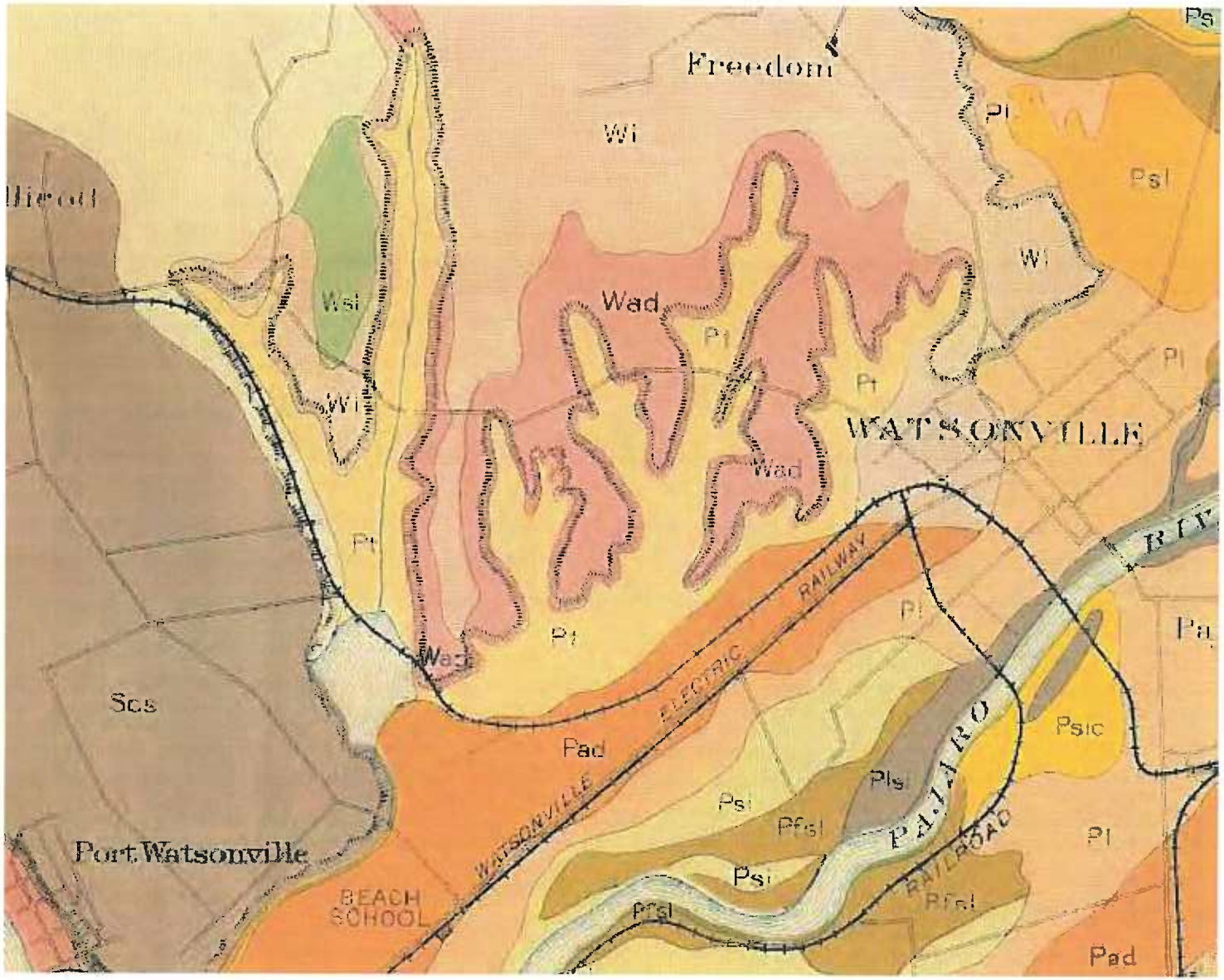
Date	No. of CRF	Location	Notes
4/9/2006	4	Frog pond 1	tadpoles sampled by dip net
6/15/2007	3	Frog pond 1	tadpoles sampled by dip net
2/9/2010	eggs	Frog pond 1	2 egg masses observed
2/12/2010	2	Frog pond 1	adults observed and heard calling during night survey
2/12/2010	4	Willows at railroad crossing	adults heard calling during night survey
3/12/2010	eggs	Frog pond 1	1 egg mass observed
3/15/2010	eggs	Frog pond 1	2 egg masses observed
9/8/2010	2	Middle Watsonville Slough channel	2 metamorphs observed at culvert crossing
2/3/2011	eggs	Frog pond 1	2 egg masses observed
4/14/2011	1	sed pond	subadult
4/14/2011	1	Frog pond 2	adult
5/4/2011	3	Willows at railroad crossing	metamorphs downstream of frog pond 1
5/4/2011	2	Frog pond 1	tadpoles observed in shallows
5/19/2011	1	Frog pond 2	subadult
4/22/2011	1	Frog pond complex, upland	metamorph moving between frog pond 1 and 2
5/22/2011	4	Chivos Pond	adults
5/23/2011	1	Frog pond 2	adult
6/3/2011	2	Chivos Pond	adults
6/28/2011	3	Sediment pond 3	2 subadults, 1 adult
7/13/2011	1	Sediment pond 3	adult
7/15/2011	1	Sediment pond 3	adult under cover board
7/19/2011	2	Sediment pond 3	1 adult, 1 subadult daytime observations
7/20/2011	2	Willows at railroad crossing	subadults in shallow willows
7/21/2011	3	Willows at railroad crossing	metamorphs downstream of frog pond 1
8/1/2011	2	Sediment Pond 3	adult daytime observations
8/16/2011	2	Sediment Pond 3	1 adult, 1 subadult daytime observations
9/8/2011	1	Frog pond 2	subadult under cover board

9/28/2011	1	"Thumb" restoration area	metamorph relocated by J. Robins from upland during grading
2/22/2012	1	Frog pond 2	adult under cover board
2/26/2012	1	Frog pond 2	subadult under cover board
3/7/2012	2	Frog pond 2	daytime calling males
4/6/2012	3	Chivos Pond	adult daytime observation of adults
5/1/2012	1	Frog pond 2	adult daytime observation
6/16/2012	1	Frog pond 2	adult daytime observation
6/16/2012	2	Chivos Pond	adult daytime observation
7/13/2012	1	Willows at railroad crossing	adult daytime observation
7/13/2012	12	Frog pond 2	metamorphs observed during daytime survey
7/20/2012	1	Willows at railroad crossing	subadult daytime observation
7/25/2012	1	Bryant-Habert Watsonville Slough ditch	adult daytime observation
10/1/2012	1	Frog pond 2	adult daytime observation
11/26/2012	2	Frog pond 2	adults heard calling during daytime survey
11/27/2012	3	Frog pond 2	adults heard calling during daytime survey
1/21/2013	2	East Arm Hansen Slough	night survey observations made by kayak, not calling
1/21/2013	1	Frog pond 1	night survey observation, not calling
2/4/2013	1	Frog pond 1	night survey observation, not calling
2/13/2013	1	East Arm Hansen Slough	night survey obs. made by kayak, in open water, not calling
2/13/2013	5 to 7	Lower Harkins Slough west of tracks	night survey, adult breeding calls
2/16/2013	eggs	Frog pond 1	1 egg mass observed. Impacted by feeding coots.
2/18/2013	5 to 7	Lower Harkins Slough west of tracks	night survey, adult breeding calls
2/18/2013	25 to 30	Middle Watsonville Slough	night survey, adult breeding calls
2/18/2013	5 to 7	railroad crossing channel and willows	night survey, adult breeding calls
2/18/2013	1	Upper West Hanson Slough	night survey, adult breeding call
2/26/2013	8	Bryant-Habert Watsonville Slough	night survey, adult breeding calls
3/14/2013	1	Frog pond 1	night survey, adult breeding call
3/14/2013	4	Railroad crossing channel	night survey, 1 adult calling, 3 other adults obs. at RR crossing.
3/14/2013	3	Bryant-Habert Watsonville Slough ditch	night survey, 1 adult calling, 1 subadult and 1 other adults obs.

5/17/2013	5	Frog pond 2	subadults visually obs. during dipnet sampling
5/26/2013	5	Frog pond 2	subadults visually obs. during minnow trap sampling
5/26/2013	4	Frog pond 1	tadpoles capture in minnow traps
9/16/2013	2	Railroad crossing channel	metamorphs at upstream end of culvert crossing
9/18/2013	1	Railroad crossing channel	metamorph at upstream end of culvert crossing
10/4/2013	3	Railroad crossing channel	adults at downstream end of culvert crossing, with bullfrogs
10/5/2013	2	Railroad crossing channel	adults at downstream end of culvert crossing, with bullfrogs
10/7/2013	4	Railroad crossing channel	adults at downstream end of culvert crossing, with bullfrogs
10/10/2013	1	Frog pond 2	subadult
10/18/2013	2	Frog pond 2	adults under cover board
1/22/2014	2	Railroad crossing channel	night survey, adult breeding calls, upstream
3/12/2014	1	Railroad crossing channel	adult daytime observation during egg mass survey, upstream
3/12/2014	eggs	Middle Watsonville Slough	one egg mass observed in open water, 6 large carp also present

APPENDIX B: Historic Aerial Photos and Soil Maps - Watsonville Slough Farm 1910 to 2013

1910 SCS Map


Freedom
Wi
Psl
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WATSONVILLE
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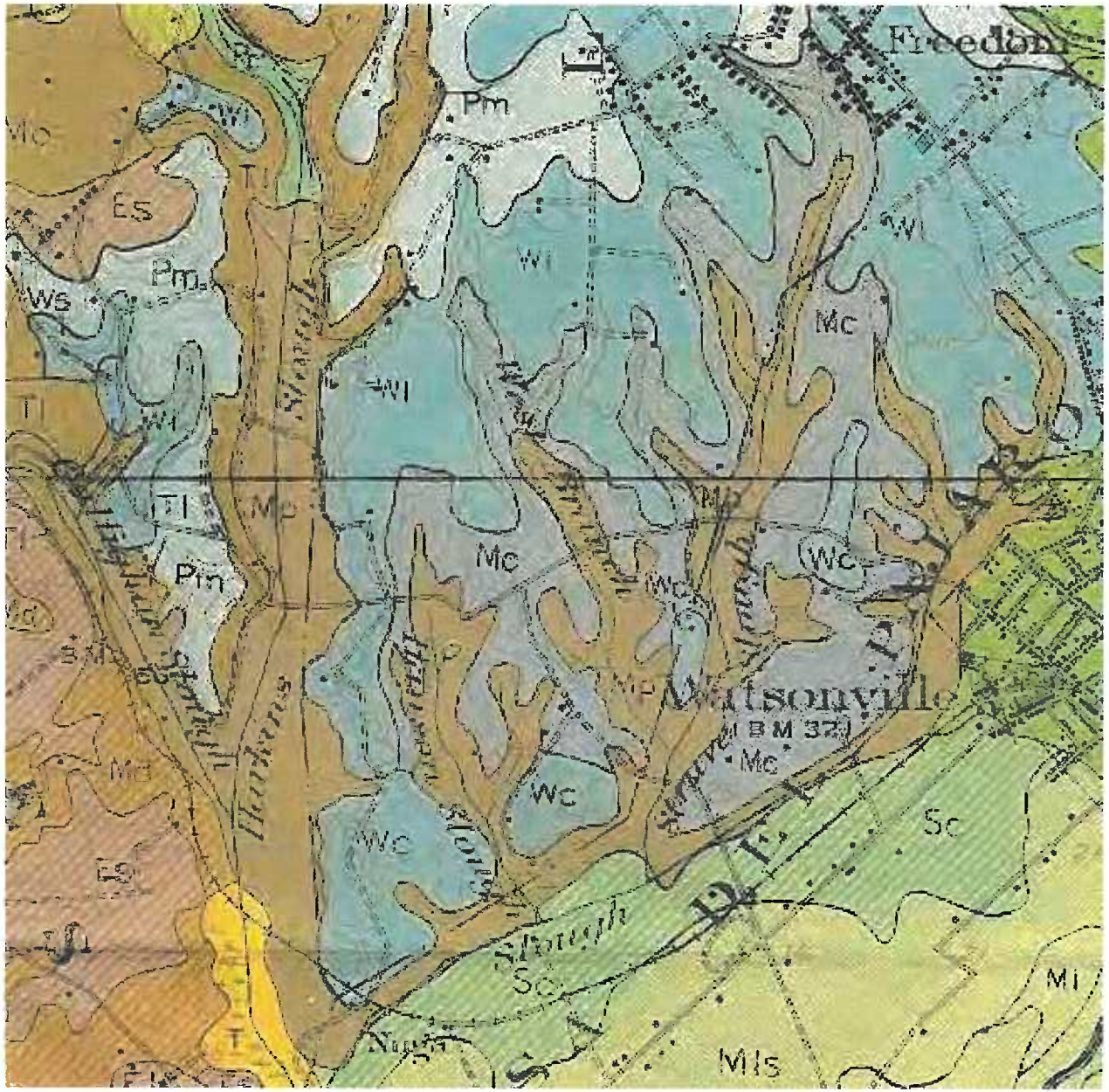
Port Watsonville
BEACH SCHOOL
Prsl
Pad

1931

1935 SCS Map

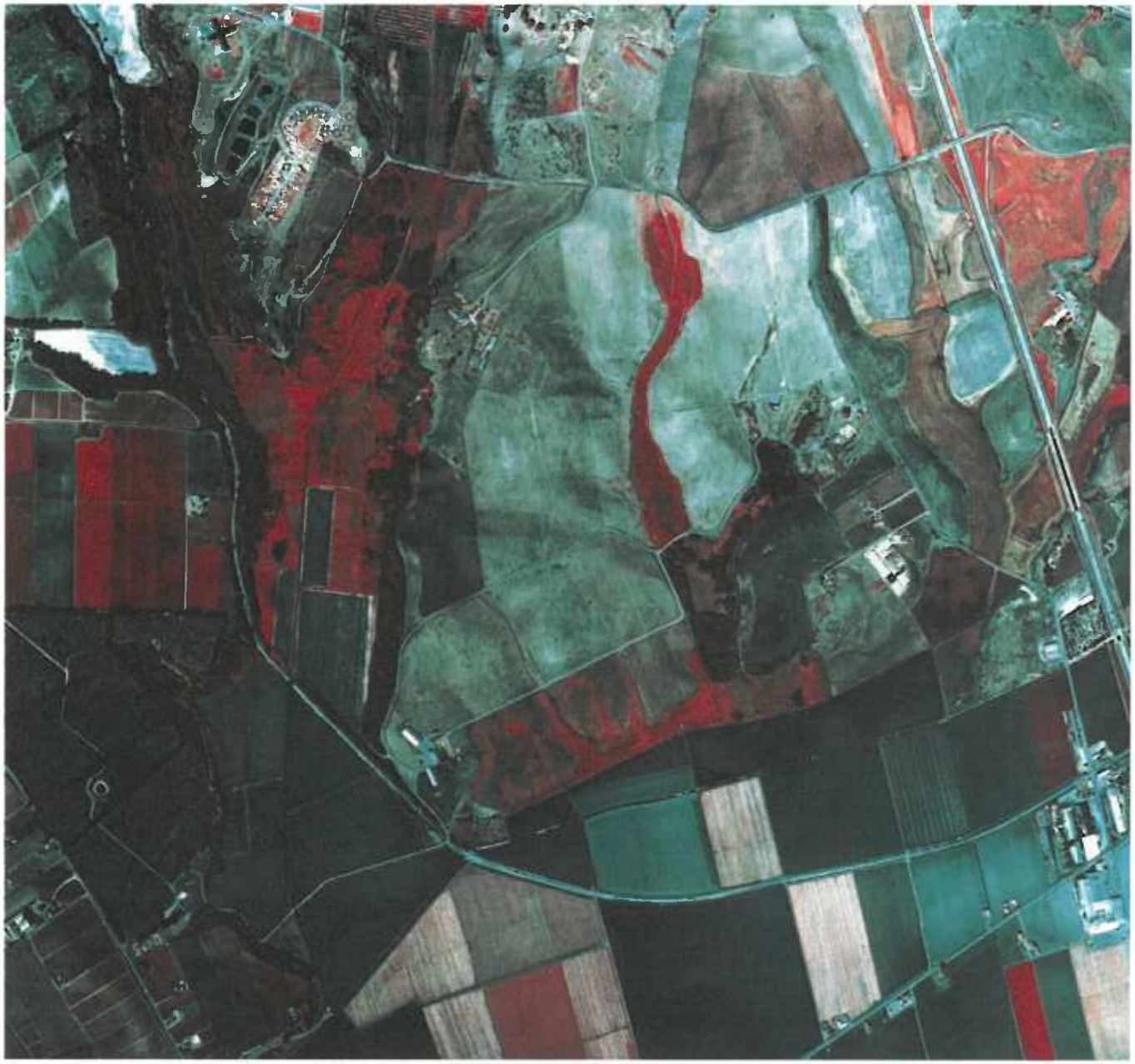


1935

1948

1963

1974



1975

1979

1982

1987

1992

2003

2005

March 18, 2009

April 14, 2013

Millions of dollars in peat will be harvested in coming summers, as the waters recede from the sloughs.

Peat operation under way in slough

By GUY LASNIER

In the next 10 to 15 years the land west of the freeway and south of Harkins Slough Road to the Southern Pacific tracks will change slowly but dramatically. Where a series of sloughs now lie submerged in the winter (and spring this year), dry and sometimes cultivated in the summer and fall, a series of oblong ponds will cover much of the area.

The ponds, some 100 feet long and up to 12 feet deep, will be created as peat is removed. The project, known officially as the Watsonville Slough Wildlife Area Restoration Project, consists of a private peat harvesting operation involving about 300 acres of a 728-acre parcel of land belonging to three different parties.

The project is a unique cooperative agreement between a private firm and a state agency. The State Department of Fish and Game is a co-sponsor and will oversee the operations run by Anderson Peat/Organic Compost, a subsidiary of Old Fort Industries, of Fort Wayne, Ind., one of the largest peat harvesting and selling firms in the country.

Anderson began quickly, removing peat last fall with bulldozers shortly after the Coastal Commission granted a permit. The rains have held up peat removal and packaging, and operations may not start up again until June, according to Anderson plant manager Tom Olekszyk.

Peat is decayed plant material laid down over thousands of years. Anderson Peat will sell it to chain stores such as Sears, K-Mart and Wards as garden products, potting mix, peat moss and topsoil, said Pat Morgan, in charge of marketing for the local operation.

When the company has finished removing the peat from the sloughs, a 15- to 20-year project, the 164 acres it owns will be granted to the state Department of Fish and Game for a wildlife preserve. The title now sits in escrow with Penniman Title in Santa Cruz.

A conservation easement will be granted to the department for 455 acres owned by Lee-Harkins Farms after the peat is removed. Anderson Peat is leasing the acreage from Lee-Harkins Farms for $60,000 a year.

The department of Fish and Game owns the West Branch of the Struve Slough, 109 acres between Highway One and Lee Road. Peat is scheduled to be harvested from the West Branch also even though the state already owns it and despite claims from conservationists that it is the least disturbed of all the sloughs.

Harkins, Hansen, and Gallighan sloughs have all been substantially altered, in the words of the Coastal Commission staff report on the area, due to farming, grazing, and installation of drainage channels over the years. Because the land has been changed from its natural state the harvesting is called a "resource removal and restoration project."

Critics challenge the restoration aspect charging that the project will change but not restore the land. It was the hope of preserving the area, however, that got the project going.

Walt Smith, a Fish and Game wildlife biologist, and real estate agent Chuck Allen are primarily responsible. Smith, who retired from the department in December, said he recommended about two years ago that the state buy 109 acres from Telles Farms. Smith said he was concerned there would be development in the area and he saw the opportunity to acquire the land and preserve it as a wildlife refuge.

Chuck Allen was the agent trying to sell the land. He said Friday that he wanted to find a company that could "utilize the assets of the land" and came up with the peat harvesters, Old Fort Industries.

The state cannot by law bid more than the appraised value for a piece of land and bid about $3,000 an acre for the Telles property. Old Fort bid substantially more and eventually paid $463,000, or about $4,250 an acre.

Old Fort also bought 55 acres from West Coast Farms for $182,500. The company wanted to buy some land owed by the county of Santa Cruz along Harkins Slough Road, but the county did not even respond to the offer, Allen said.

Then came the deal that made partners of the department of Fish and Game and Old Fort Industries. Old Fort offered a tradeoff: it would harvest peat then turn the land over to Fish and Game. In concept everyone wins. As Chuck Allen said, "There's no need for the state to waste its money when it can get the land anyway."

The real advantage is that the project sailed through the normally strict coastal commission review process. And because the department of Fish and Game was a co-applicant for a coastal permit, all county permits and regulations were bypassed completely and the proposal was exempt from Cali-

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While state land can be exempted from CEQA standards private land cannot be. Critics have charged that because 619 acres are now private, despite the promise of a transfer of title in the future, the act has been violated.

The relative quickness with which the project was approved had led conservationists to

(Continued on page 2)

Photos by Kurt Ellison

The finished product sits outside the company's packing shed.

Forecast

Light rain spreading over the area by Sunday.

Details page 2.

Peat moss operation

(Continued from page 1)

charge it was "ramrodded through" the permit process.

Had only a private company been involved, said John Stanley, an ecological consultant who has studied the area, "Fish and Game would have demanded an environmental impact report. No private firm could ever get away without one," he said, adding that preparing such reports is "what I do for a living."

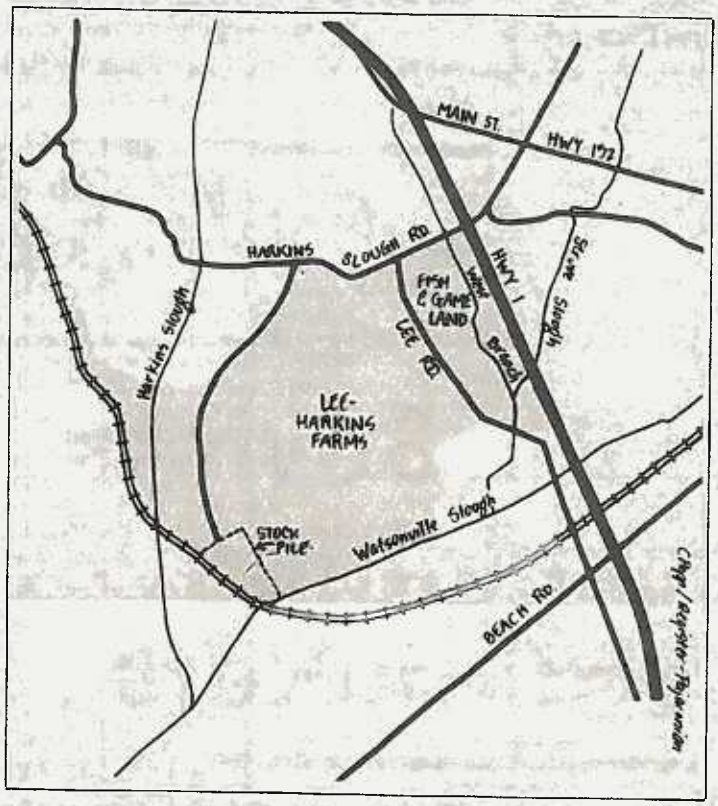
Jerry Busch, a naturalist who has pushed for a local committee to oversee the operation, said, "only the most cursory analysis of the short and long-term effects of the project" have been made.

The Santa Cruz County Board of Supervisors asked the county counsel to review the project to see if the county had any jurisdiction. The county does not, it turns out. Then board president Joe Cucchiara wrote to the director of Fish and Game to request that a local committee work with the department to oversee the project. Regional manager Brian Hunter wrote back earlier this month to say that the situation "could be better handled with one or two meetings with the people and groups concerned."

When the Coastal Commission reviewed the project last summer, it relied on Fish and Game's participation to assure that the peat harvesting would be handled responsibly and voted unanimously to approve it.

Now that Walt Smith has retired, responsibility for overseeing the operation falls on Gil Thompson, a fish and game wildlife biologist at the department's Yountville headquarters, until someone is named to fill Smith's position.

The local chapter of the Sierra Club did not take a position on the project at the August Coastal Commission hearings. Since then, however, concerns have been raised by chapter president Dave Bockman and others.



The Santa Cruz Bird Club was the only group on record as opposing the plan. It argued that the change from a partially wet habitat to a deep-water habitat would significantly change the area and the types of birds that frequent it.

Other deep water exists in the area for migrating waterfowl, the group claimed in a letter to the commission. The bird club is still challenging some of the assumptions on which the project is based.

Most of the attention focuses on the West Branch of Struve Slough. Suzanne Shettler, the vice president of the local chapter of the California Native Plant Society, said the west branch is the least disturbed

stands in piles at the site, still too wet to package.

Plant manager Olekszyk said the peat has to dry to a moisture content of between 20 and 50 percent before it can be packaged.

When the operation is under way, some 50 people will be employed, Chuck Allen estimated. Tractors will drive atop the sloughs scraping first the silt and topsoil off then cutting the peat and scooping it into trucks.

When possible, Olekszyk said, wide-tread tractors like snowblowers will chop the material and blow it into trucks. Over the years, however, a variety of plants have been compacted in the sloughs including trees. Olekszyk said he came across some redwood trees buried last fall. Trees and large sticks that

Coastal Commission hearings. Since then, however, concerns

Weather

Yesterday high 66, overnight low 44, today noon 52.

Sun sets Saturday 6:25 p.m., rises Sunday 6:02 a.m. Sun sets Sunday 6:26 p.m.; rises Monday 6:01 a.m.

Tides — Sunday low 2:57 a.m., 1.0 ft., high 8:58 a.m., 5.3 ft., low 3:25 p.m., -0.7 ft., high 9:57 p.m., 4.9 ft. Monday low 3:47 a.m., 0.5 ft., high 9:52 a.m., 5.1 ft., low 4:05 p.m., -0.3 ft., high 10:32 p.m., 5.0 ft.

Monterey Bay area: Light rain spreading south tonight. Lows in the upper 30s and 40s. Partly cloudy on Sunday after a chance of morning showers. Highs in the upper 50s to mid 60s.

Northern California: Occasional rain decreasing to showers on Sunday. Snow levels 4,000 to 6,000 feet. Lows in the mid 30s to the 40s. Highs in the mid 50s to the 60s. Increasing southerly winds along the coast today and tonight.

Sierra Nevada: Rain tonight with snow level lowering to 4,000 to 6,000 feet in the north, 5,000 to 6,000 feet in the south.

Los Angeles: Increasing clouds on Sunday with highs in the upper 60s.

Plant Society, said the west branch is the least disturbed and has the highest natural quality in of the area. Ms. Shettler conducted a plant and animal count on contract for Old Fort Industries last summer. She calls the west branch a rare area with a "wide diversity and extensive coverage of native species as opposed to the weedy things that fill in after an area is disturbed."

She said the project would change a rare area into a commonplace one.

Consultant Busch, whose specialty is wetlands, such as sloughs, said the west branch should be the last area harvested, maybe 10 years down the line, because it is the most natural. "Let's see what happens with the other areas first," he said. Busch's main concern is that the ponds will become brackish from standing water and irrigation runoff.

So far the project is off to a slow start because of the weather. A 1.1 mile base rock road was cut from Harkins Slough Road across Lee-Harkins land by Granite Construction to give access to the stockpiling and packaging site, about 35 acres at the southwest corner. The road is scheduled to be paved this summer. Some peat was removed from the lower end of Harkins Slough, but most of it some redwood trees buried last fall. Trees and large sticks that haven't decomposed wreak havoc with the blowers, he said.

"You never know what fell 1,000 years ago," he said.

Fire calls

Watsonville

10:20 a.m., Friday, vehicle fire, 735 W. Beach St.

12:00 p.m., medical aid, 422-A E. Beach St.

2:14 p.m., medical aid, Trafton Alley at Marchant Street.

10:19 p.m., medical aid, 924-A Freedom Blvd.

Freedom

1:53 p.m., Friday, vehicle accident, injuries, 121 Manfre Road.

3:00 p.m., investigation, fumigation tarp over wires, 361 Dutchman Road.

Salsipuedes

7:29 a.m., Friday, reported pole into house, nothing found, Hughes and Heiner Roads.

10:33 a.m., smoke in house, 30 College Road.

11:03 a.m., vehicle accident, no injuries, 110 Carlton Road.

Aptos

12:56 p.m., vehicle fire, out on arrival, 9063 Soquel Drive.

1:58 p.m., alarm sounding, 918 El Sereno Court.

7:04 p.m., paramedic call, 567 Clubhouse Drive.

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Attachment 6

Natural Resource Conservation Service
Wetland Determination Documentation for Bryant-Habert: Report to File

April 18, 2013

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United States Department of Agriculture
NRCS Natural Resources Conservation Service

65 Main St., Suite 108
Templeton CA 93465
(805) 434-0396
FAX (805) 434-0284

April 18, 2013

Kelli Camara
RCD of Santa Cruz County
Capitola, California

Subject: Wetland Determination Documentation for Bryant-Habert: Report to File

On April 1, 2013 I visited the Bryant-Habert property, and met with you to check for possible wetlands.

I found 23.1 acres of wetland (label W) and 8.1 acres of non-wetland (label NW). Hydrophytic plants in the wetland included, Popcorn flower (Plagiobothrys bracteatus), Field mint (Mentha arvensis), Curly dock (Rumex crispus), Rabbitfoot grass (Polypogon monspeliensis), and non-wetland plants including Bristly ox tongue (Heminthotheca echioides), Willow herb (Epilobium branchycarpum), and Sour clover (Melilotus indicus). Soils met hydric soils indicator F3, Depleted Matrix. Aerial photos indicated saturation meeting wetland hydrology. See NWI Map. Precipitation has been about 62 % of average. I determined the wetland boundary by following the transition from Epilobium ciliatum (FACW indicator), and Epilobium brachycarpum (No wetland indicator).

See the following attached documentation.

Location Map
Wetland Delineation Map with Data Points
Ground Photos
Wetland Determination Data Forms
NWI Map
Topo/Soils/Hydric Soils Map
Hydric Soils Table
Brief Soil Descriptions
Water Features Table

Ken Oster
Area Resource Soil Scientist

United States Department of Agriculture
NRCS Natural Resources Conservation Service

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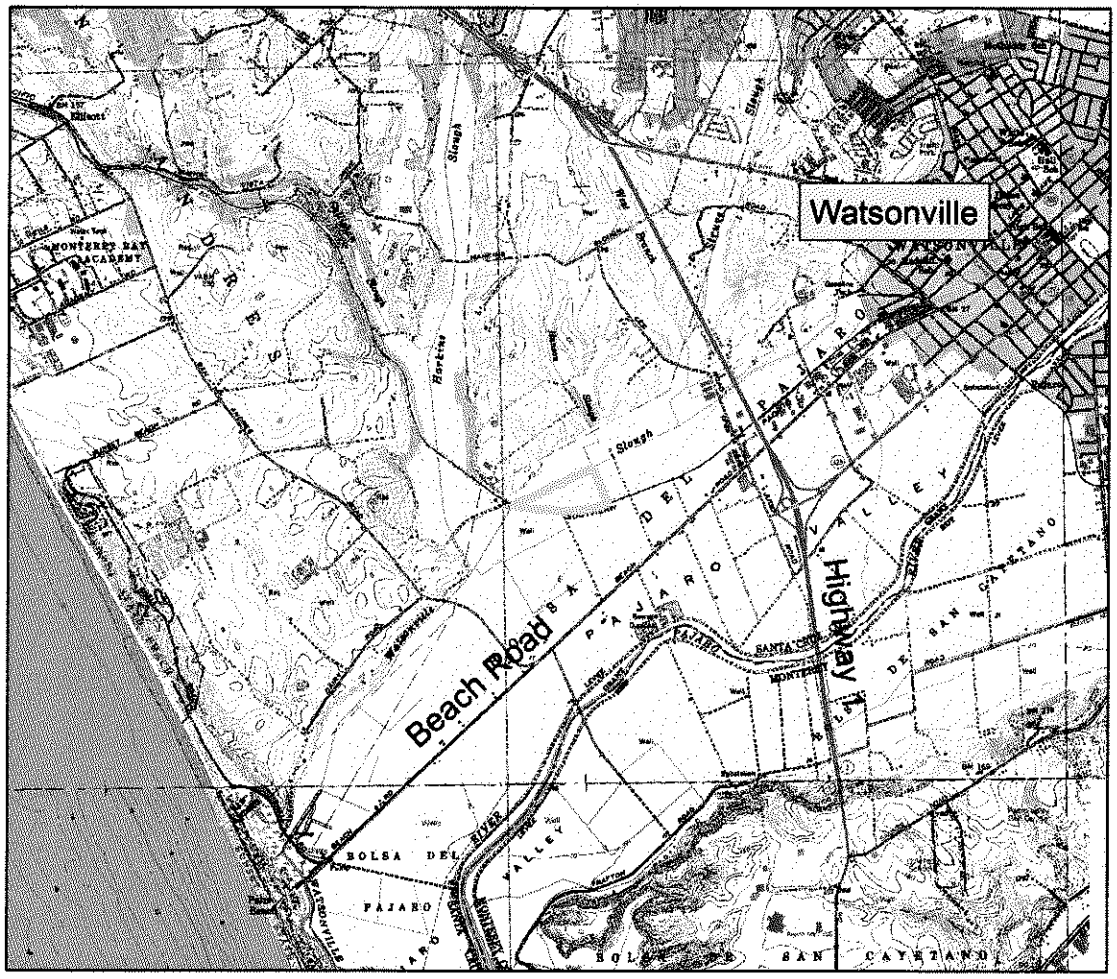
Location Map

Location Map Map

Date: 4/1/2013

Field Office: CAPITOLA LPO
Agency: USDA-NRCS
Assisted By: Ken Oster
State and County: CA, SAN LUIS OBISPO

Legal Description: Bryant-Habert Property
Beach Road, Watsonville, CA



Legend

Project

2,100 0 2,100 4,200 6,300 8,400 Feet

N

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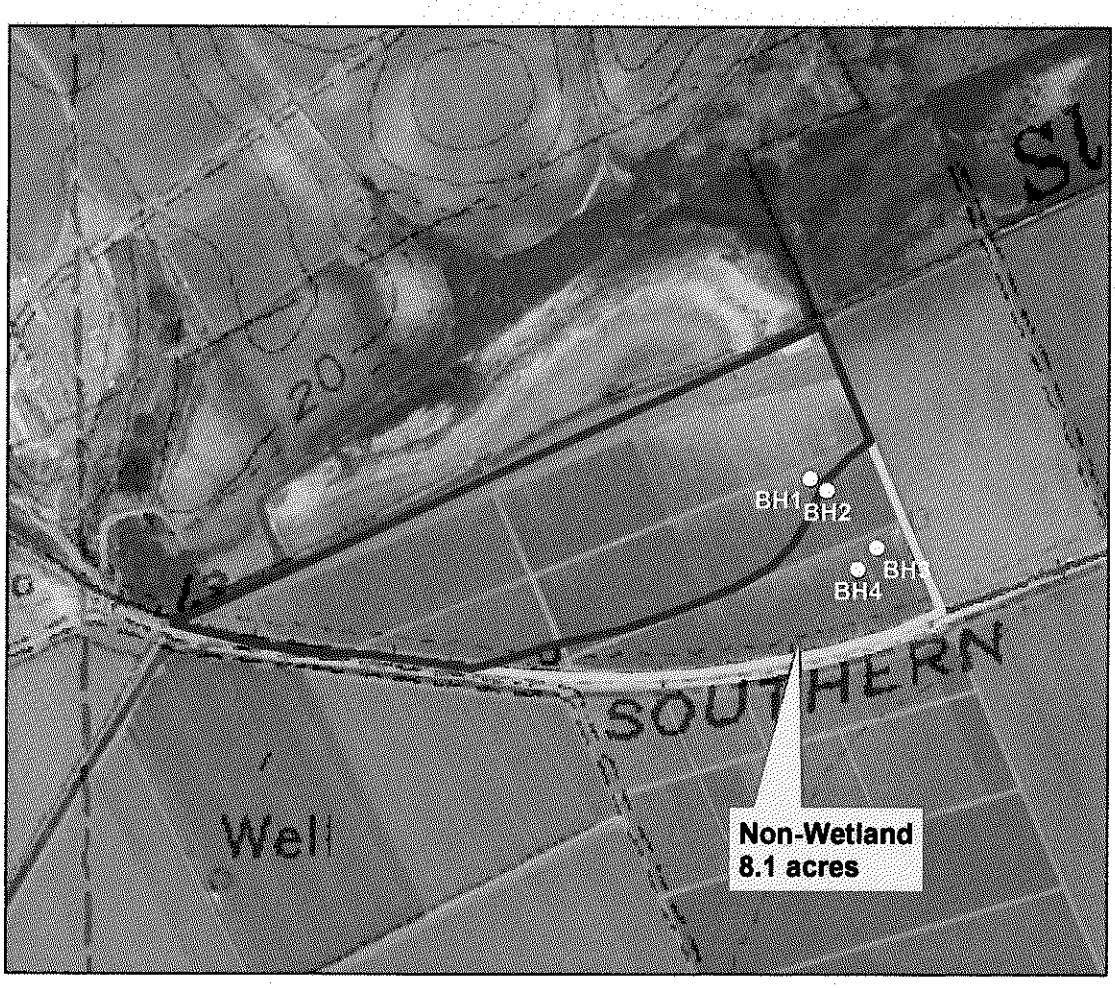
Wetland Delineation Map with Data Points

Wetland Delineation Map

Field Office: CAPITOLA LPO
Agency: USDA-NRCS
Assisted By: Ken Oster
State and County: CA, SAN LUIS OBISPO

Legal Description: Bryant-Habert Property
Beach Road
Santa Cruz County, California



Legend

- Data Points
- Wetland, 23.1 acres
- vicinity

260 0 260 520 780 1,040 Feet

N

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Ground Photos

Data Point BH1

Data Point BH2

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Data Point BH3

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Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Water treatment City/County: Watsonville Santa Cruz Sampling Date: 4/4/13
Applicant/Owner: Bryant-Hebert State: CA Sampling Point: BH1
Investigator(s): Ken Oster Section, Township, Range: 7, T12S, R2E Watsonville West
Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): linear Slope (%): <1
Subregion (LRR): C Lat: 36.895685 Long: 121.79203 Datum: NAD83
Soil Map Unit Name: 119-Clear Lake clay, moderately wet NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.) low precip
Are Vegetation ND, Soil ND, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ND, Soil ND, or Hydrology ND 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

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Willows (Salix lasiolepis)	20%	Y	FACW
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Helminthotheca echioides	2	N	FACU
2. Plagiobothrys bracteatus	5	N	FACW
3. Mentha arvensis	20	Y	FACW
4. Epilobium brachycarpum	30%	Y	—
5. Rumex crispus	5%	N	FACW-
6. Polypogon monspeliensis	20%	Y	FACW+
7. Melilotus indicus	10%	N	FACU
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (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:
✓ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

US Army Corps of Engineers — Arid West – Version 11-1-2008

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SOIL

Sampling Point: BH1

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
0-4	2.5Y4/2	100					clay	
4-10	2.5Y4/2	100					clay	
10-18	2.5Y4/2	100	10YR 4/4	2	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ 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)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type: ____
Depth (inches): ____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

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

Remarks:

United States Department of Agriculture
NRCS Natural Resources Conservation Service

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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Water treatment City/County: Watsonville Santa Cruz County Sampling Date: 4/1/13
Applicant/Owner: Bryant – Habert State: CA Sampling Point: BH2
Investigator(s): Ken Oster Section, Township, Range: 7, T12S, R2E Watsonville West
Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): linear Slope (%): <1
Subregion (LRR): C Lat: 36.894378 Long: -121.79434 Datum: NAD83
Soil Map Unit Name: 119 - Clear Lake clay, moderately wet NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.) low precip.
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation No, Soil No, or Hydrology No 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

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1:			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Melilotus indicus	80%	Y	FACU
2. Rumex crispus	5%	N	FACW
3. Helminthotheca echioides	2%	N	FACU
4. Epilobium ciliatum	5%	N	FACW
5.			
6.			
7.			
8.			
Total Cover:	92%		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (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 ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:
No Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

United States Department of Agriculture
NRCS Natural Resources Conservation Service

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(805) 434-0396
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SOIL

Sampling Point: BH2

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
0-13	2.5Y 4/2	100					clay	
13-18	2.5Y 4/2	98	10YR 4/4	2	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix; [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ 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)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type: ___
Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

none

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

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

Remarks:

US Army Corps of Engineers — Arid West – Version 11-1-2008

United States Department of Agriculture
NRCS Natural Resources Conservation Service

65 Main St., Suite 108
Templeton CA 93465
(805) 434-0396
FAX (805) 434-0284

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Water treatment City/County: Watsonville / Santa Cruz Co Sampling Date: 4/1/13
Applicant/Owner: Bryant - Habert State: CA Sampling Point: BH3
Investigator(s): Ken Oster Section, Township, Range: 7, T12S, R2E Watsonville West
Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): linear Slope (%): 1
Subregion (LRR): Lat: 36.894191 Long: 121.794806 Datum: NAD83
Soil Map Unit Name: 119 - Clear Lake clay, moderately wet NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.) low precip
Are Vegetation No, Soil No or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No or Hydrology No 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 X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Geranium dissectum	20	Y	None
2. Melilotus indicus	20	Y	FACU
3. Plagiobothrys bracteatus	2	N	FACW
4. Picris echioides	20	Y	FACU
5. Polygonum monspeliensis	20	Y	FACW
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (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:
No Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No K

Remarks:

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SOIL

Sampling Point: BH3

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
0-13	2.5Y4/2	100					clay	
13-18	2.5Y4/2	98	10YR4/4	2	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix; [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ 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)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

none

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

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 X No ____

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

Remarks:

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FAX (805) 434-0284

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Water treatment City/County: Watsonville Santa Cruz Sampling Date: 4/1/13
Applicant/Owner: Bryant-Habert State: CA Sampling Point: BH4
Investigator(s): Ken Oster Section, Township, Range: T11S, R2E Watsonville West
Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): linear Slope (%): 2
Subregion (LRR): C Lat: 36.894301 Long: 121.795759 Datum: NAD83
Soil Map Unit Name: 119 - Clear Lake clay, moderately wet NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.) low precip
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation No, Soil No, or Hydrology No 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 X	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Medicago polymorpha	30	Y	FACU
2. Melilotus indicus	20	Y	FACW
3. Geranium dissectum	20	Y	None
4. Polypogon monspeliensis	10	N	FACW
5. Rumex crispus	5	N	
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (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:
No Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

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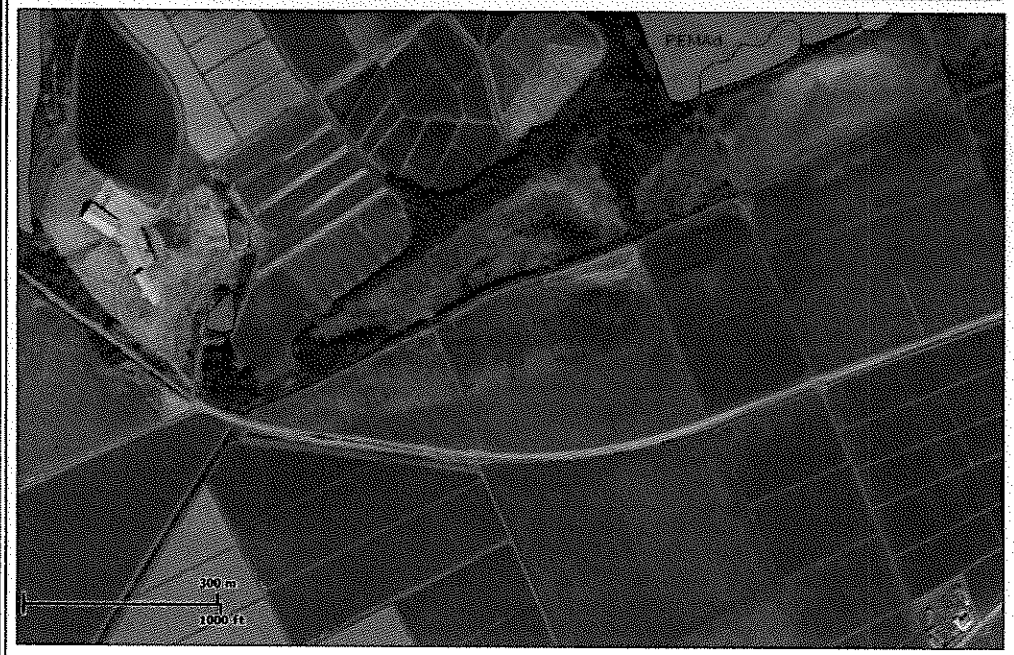
FAX (805) 434-0284

U.S. Fish and Wildlife Service

National Wetlands Inventory

Bryant-Habert

Apr 14, 2013



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

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NRCS Natural Resources Conservation Service

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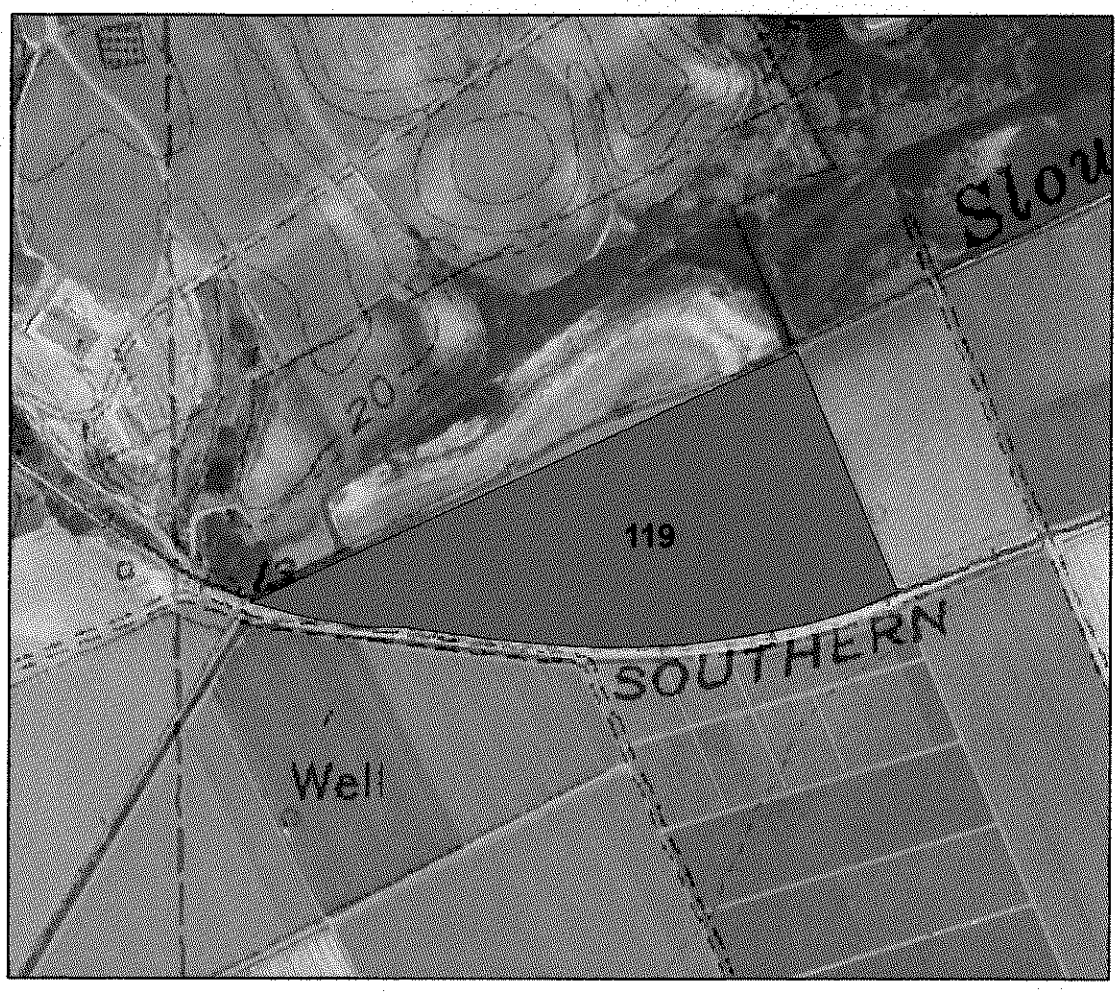
Topo/Soils/Hydric Soils Map

Topo/Soils/Hydric Soils Map

Date: 4/1/2013

Field Office: CAPITOLA LPO
Agency: USDA-NRCS
Assisted By: Ken Oster
State and County: CA, SAN LUIS OBISPO

Legal Description: Bryant-Habert Property
Beach Road, Watsonville, CA



Legend
{AP, <}
All Hydric
Partially Hydric
Not Hydric
Unknown Hydric
Not rated or not available
Soils Map

320 0 320 640 960 1,280 Feet

N

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Hydric Soils Table

Hydric Soils (CA)

Santa Cruz County, California

Absence of an entry indicates that the feature is not a concern or that data were not estimated. Definitions of hydric criteria codes are included at the end of the report.

Mapunit Symbol	Mapunit Name	Component %	Component	Local Phase	Hydric Condition	Landforms	Hydric Rating	Hydric Criteria	Altered Hydrology Notes
119	Clear Lake clay, moderately wet								
		85	CLEAR LAKE		Neither wooded nor farmable under natural conditions	Basin floors	Yes	2B3	Artificial drainage has lowered the water table.
		5	CONEJO LOAM				No		
		2	UNNAMED		Neither wooded nor farmable under natural conditions	Basin floors	Yes	2B3	

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Brief Soil Descriptions

Brief Soil Descriptions (CA)

Santa Cruz County, California

[Absence of an entry indicates that the feature is not a concern or that data were not estimated. Data applies to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by on-site investigation.]

119 - Clear Lake clay, moderately wet

Composition

- CLEAR LAKE and similar soils: 85 percent of the unit
- CONEJO LOAM: 5 percent of the unit
- UNNAMED: 2 percent of the unit

Setting

Landform(s): basin floors
Elevation: 20 to 1499 feet
Precipitation: 10 to 35 inches
Slope gradient: 0 to 2 percent
Air temperature: 57 to 63 °F
Frost-free period: 245 to 275 days

Characteristics of CLEAR LAKE and similar soils

Average total avail. water in top five feet (in.): 8.7
Available water capacity class: Moderate
Parent material: alluvium derived from sedimentary rock
Restrictive feature(s): none
Depth to Water table: 54 inches
Drainage class: poorly drained
Flooding hazard: none
Ponding hazard: none
Soil loss tolerance (T factor): 5
Wind erodibility group (WEG): 7
Wind erodibility index (WEI): 38
Land capability class, irrigated: 2w
Land capability class, non-irrigated: 3w
Hydric soil: yes
Hydrologic group: D
Runoff class: medium
Potential frost action: none

Saturated hydraulic conductivity class: Moderately Low

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available Water Capacity (inches)	pH	Salinity (mmhos/cm)	SAR
H1 -- 0 to 7	Clay	0.9 to 1.1	6.6 to 8.4	0 - 0	0 - 0
H2 -- 7 to 62	Silty clay	6.6 to 8.8	7.4 to 8.4	0 - 4	3 - 15
H2 -- 7 to 62	Clay	6.6 to 8.8	7.4 to 8.4	0 - 4	3 - 15

Ecological class(es):

United States Department of Agriculture
NRCS Natural Resources Conservation Service

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Water Features Table

Water Features

Santa Cruz County, California

[Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated. This report shows only the major soils in each map unit]

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
119:										
CLEAR LAKE	D	Medium	January	3.0->6.0	>6.0	—	—	None	—	Rare
			February	3.0->6.0	>6.0	—	—	None	—	Rare
			March	3.0->6.0	>6.0	—	—	None	—	Rare
			April	3.0->6.0	>6.0	—	—	None	—	Rare
			May	—	—	—	—	None	—	Rare
			June	—	—	—	—	None	—	Rare
			July	—	—	—	—	None	—	Rare
			August	—	—	—	—	None	—	Rare
			September	—	—	—	—	None	—	Rare
			October	—	—	—	—	None	—	Rare
			November	—	—	—	—	None	—	Rare
			December	3.0->6.0	>6.0	—	—	None	—	Rare
CONEJO LOAM	—	—	Jan-Dec			—	—	None	—	None
UNNAMED	—	—	Jan-Dec			—	—	None	—	None

Attachment 7

Protection of California Red-legged Frog from Pesticides Stipulated Injunction and Order

October 20, 2006

Protection of California Red-legged Frog from Pesticides

Back to Endangered Species Project

Stipulated Injunction and Order

Background

On October 20, 2006, the U.S. District Court for the Northern District of California imposed no-use buffer zones around California red-legged frog upland and aquatic habitats for certain pesticides. This injunction and order are part of a settlement reached between U.S. EPA, CropLife America, American Forest and Paper Association, Western Plant Health Association, Oregonians for Food and Shelter, and Syngenta Corporation as co-defendants, and the Center for Biological Diversity as the plaintiff.

The suit by the Center for Biological Diversity alleged that U.S. EPA failed to solicit U.S. Fish & Wildlife Service (FWS) formal consultation on the risks of 66 pesticides to California red-legged frog (CRLF).

This injunction and order will remain in effect for each pesticide listed below until EPA goes through formal 7(A)(2) consultation with FWS on each of the 66 active ingredients, and FWS issues a Biological Opinion including a "not likely to adversely affect" statement for the pesticides. Each pesticide in turn will be removed from the list, as this occurs.

Pesticide Use Restrictions Now Required
Under the injunction and order, no-use buffer zones of 60 feet for ground applications and 200 feet for aerial applications apply from the edge of the following California red-legged frog habitats as defined by the U.S. Fish & Wildlife Service and the Center for Biological Diversity: Aquatic Feature, Aquatic Breeding Habitat, Non- Breeding Aquatic Habitat, and Upland Habitat (details on these habitats are given in a Powerpoint Presentation following the list of prohibited active ingredients). These CRLF habitats are found in 33 counties of California link to map, PDF (455 kb).
The active ingredients for which the no-use buffer zones apply are the following:

2,4-D	Endosulfan	Myclobutanil	Thiobencarb
Acephate	EPTC	Naled	Tribufos (DEF)
Alachlor	Esfenvalerate	Norflurazon	Triclopyr
Aldicarb	Fenamiphos	Oryzalin	Trifluralin
Atrazine	Glyphosate	Oxamyl	Vinclozolin
Azinphos-methyl	Hexazinone	Oxydemeton-methyl	Ziram
Bensulide	Imazapyr	Oxyfluorfen	
Bromacil	Iprodione	Paraquat dichloride	
Captan	Linuron	Pendimethalin	
Carbaryl	Malathion	Permethrin	
Chloropicrin	Mancozeb	Phorate	
Chlorothalonil	Maneb	Phosmet	

Chlorpyrifos	Metam sodium	Prometryn
Chlorthaldimethyl (DCPA)	Methamidophos	Propanil
Diazinon	Methidathion	Propargite
Dicofol	Methomyl	Propyzamide (Pronamide)
Diflubenzuron	Methoprene	Rotenone
Dimethoate	Methyl parathion	Simazine
Disulfoton	Metolachlor	Strychnine
Diuron	Molinate	Telone (1,3-dichlorpropene)

In order to assist the public in learning all the details of the stipulated injunction and court order, DPR has developed a presentation, PDF (2.2 mb) file covering all aspects of this document.

As more information becomes available, DPR will post it on this Web site.

For more information:

- Information to Assist Pesticide Users in Determining Whether the California Red-legged Frog Injunction Applies to their Proposed Pesticide Use (Steps and Information for Pesticide Users).
- Stipulated Injunction and Order (document), PDF (182 kb) (October 20, 2006).

If you have more questions about these requirements, contact:
Arty Williams
U.S. EPA Field and External Affairs Division
Washington, D.C.
Phone: (703) 305-5239
E-mail: williams.arty@epa.gov

Attachment 8

Biological Assessment
Bryant-Habert/Wait Ecological Restoration Project

October 2015

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VINNEDGE
ENVIRONMENTAL CONSULTING

BIOLOGICAL ASSESSMENT

Bryant-Habert / Wait Ecological Restoration Project

Prepared for
The Resource Conservation District of Santa Cruz County
Land Trust of Santa Cruz County

Prepared by
Vinnedge Environmental Consulting
1800 Grant Street
Berkeley, CA 94703
Contact: Brook Vinnedge

In Association with
Shawn Milar
U.S. Fish and Wildlife Service
Ventura Fish and Wildlife Office

October 2015

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Appendices

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Appendix B – Best Management Practices for Herbicide Applications at the Bryant-Habert / Wait Ecological Restoration Project

Appendix C – The Declining Amphibian Populations Task Force Fieldwork Code of Practice

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1.0 Executive Summary

The intent of the proposed Bryant-Habert / Wait Ecological Restoration Project (herein referred to as the "project") is to create and enhance seasonal wetland and upland habitat distributed across two parcels that were formerly used for agriculture. The project is located in the Watsonville Slough ecosystem, which is the largest freshwater wetland in Santa Cruz County (Figure 1). The completed project would provide benefits to two federally threatened species, the California red-legged frog (*Rana draytonii*) and the Santa Cruz tarplant (*Holocarpha macradenia*).

The Bryant-Habert and Wait parcels were used for farming until 2007 when rising slough levels limited agricultural production and the land was no longer profitable for the landowners. In 2008 and 2009, with over $12 million in grant funding secured by the State Coastal Conservancy, Wildlife Conservation Board and The Nature Conservancy, the Land Trust of Santa Cruz County (Land Trust) acquired the former Tai and Cheung parcels, comprising 441 acres adjacent to Watsonville, California. With $860,000 from the U.S. Fish and Wildlife Service (USFWS), a grant administered by the State Coastal Conservancy, the Land Trust purchased the 45-acre Bryant-Habert property in 2010 and the 4-acre Wait Trust property in 2011. Portions of these parcels became the approximately 46-acre parcel, which is part of the 490-acre Watsonville Slough Farms.

A total of 29.2 acres would be affected by the project. Of that area, 20 acres would be graded for restoration purposes (Figure 2). These areas and additional 4.3 acres would be managed to restore or enhance native vegetation. A 4-acre area, to be used for a future agricultural drainage water re-use facility, will be used for equipment staging and soil stockpiling, and 0.9 acres will continue to be managed as agricultural land. Project activities would restore 24.3 acres of the 46 acre parcel. Apart from the 29.2 acre "project site", the remaining 16.8 acres of the parcel, restored passively beginning in 2003, presently supports high quality habitat and served as the reference condition for project design.

The project has been developed in consideration of recommendations provided in the Watsonville Slough Farms Management Plan (2012), which is a joint management document prepared by the Resource Conservation District of Santa Cruz County (RCDSCC) and Land Trust. The purpose of the Watsonville Slough Farms Management Plan (Plan) is to provide guidance for the next 10 years of land management across 441 acres situated at the center of the lower Pajaro River watershed. Watsonville Slough Farms intersects with four of the six individual sloughs that sustain this large and complex ecosystem: Harkins, Hanson, Struve and Watsonville Sloughs.

The proposed project would preserve and expand existing wet meadow habitat through balanced grading to create depressions, swales and berms. The project also includes implementation of a Vegetation Management Plan. The Land Trust and RCDSCC are responsible for project design, implementation, and management of all restoration and maintenance and adaptive management activities. The grading plan for the proposed restoration project would be implemented in phases, allowing for adaptive management over time to meet the project goals and to make small changes based on an on-going understanding of site conditions and external contributing factors. The following

provide a sequential list of the general steps that would be taken to implement the proposed restoration project:

- Material and equipment mobilized to the staging area.
- Property surveyed by a USFWS-approved biologist to determine presence of special-status species in the work area. This will include installation of wildlife exclusion fencing as required by California Department of Fish and Wildlife (CDFW).
- Corridors for travel of vehicles and heavy machinery from the access road to the site established. Off-road corridors will be cleared of vegetation with a weed wacker or mower (no additional ground disturbance required).
- Initial erosion and sediment control Best Management Practice's installed at staging area and access roads.
- Material and equipment mobilized to project site. A biological monitor will be present to document observable wildlife and will move affected wildlife from the work area.
- Additional erosion control measures implemented prior to grading, per Storm Water Pollution Prevention Plan requirements.
- Portions of site disced to reduce soil compaction and provide a proper seed bed in re-vegetation areas. Depression sites cleared and disced to prepare for grading. Existing non-native vegetation removed as necessary.
- Site graded. Swales excavated and berms constructed.
- Marsh/meadow/grassland native plant material reestablished via seeding and/or transplanting. Irrigation as necessary.
- Active site monitoring, adaptive management decisions, and follow-up actions occur in accordance with the adaptive management plan, described below.
- Maintenance activities occur up to four times per year. Activities include mowing, flaming and applying herbicides, as necessary to assure native vegetation reestablishment occurs according to the Vegetation Management Plan.
- Implementation is phased: these activities would be repeated when implementation is conducted in different parts of the project area. Incremental implementation may occur over five years.

The restored site would enhance habitat conditions favorable to wetland and riparian dependent species and would restore adjacent upland habitats for the benefit of migratory birds, federally listed species, and a multitude of other native plant and wildlife species within the Watsonville Sloughs system. The site would be managed to reduce the detrimental impacts of non-native predators and invasive plants and once the proposed wetland restoration activities are completed, the water levels would be self-managed by the constructed-depth of the seasonal wetlands, intended to support breeding California red-legged frogs while discouraging the successful metamorphosis of American bullfrog (*Lithobates catesbeianus*, "bullfrog") tadpoles.

This Biological Assessment has been prepared with input and oversight from Shawn Milar, U.S. Fish and Wildlife Service (Service) biologist, Ventura Office. This Biological Assessment evaluates temporary construction effects as well as the permanent and beneficial habitat effects of the proposed action. This document also describes the conservation measures, construction methods and construction work windows that would be implemented to minimize and avoid potential construction-related effects to the federally listed California red-legged frog.

2.0 Project Description

2.1 Location and Contact Information

The project site is located in the Watsonville Slough watershed, which is the largest freshwater wetland in Santa Cruz County (Figure 1). The project is located roughly two miles inland from the Pacific Ocean and approximately two miles west of downtown Watsonville in southwest Santa Cruz County on the Watsonville West USGS 7.5-minute quadrangle. The center of the project is located at Latitude - 36°53'42.26" North and Longitude - 121°47'.38" West.

The region and surrounding land use consists primarily of wetlands, commercial agriculture and rural residential. South of the project site is the lower Pajaro River watershed, a landscape dominated by farming activities. The Watsonville State Wildlife Area is directly northeast of the project site and the project site is connected to the larger, 441 acre, Watsonville Slough Farms Management Plan area. The area is ecologically significant as it is located at the confluence with Harkins Slough, adjacent to Monterey Bay. The surrounding Middle Watsonville Slough complex is a highly valued and unique wetland resource that functions as a central drainage for all the slough tributaries before joining the mouth of the Pajaro River to enter the Pacific Ocean.

2.2 Definition of Action Area

The action area for the purposes of this Biological Assessment includes all the ingress and egress access points, all staging areas for vehicles and equipment, all earthen cut and fills sites, and all areas downstream of the project site that may receive limited sediment from the project activities. The Land Trust would make every effort to avoid sediment moving off site through erosion control measures applied as a requirement of the State Water Resources Control Board 401 Certification process. Access to the site by the workers would be along farm roads, primarily via West Beach Street and possibly via Harkins Slough Road. A temporary work corridor and access route would be established by removing vegetation with a weed whacker or mower or discing prior to project construction (no grading or ground disturbance would be required). All construction equipment would be staged in a 4-acre area denuded of vegetation located in the southeast corner of the property. This area will be retained for future agricultural drainage water recycling; similarly, a 0.9-acre corridor of agricultural habitat located on the

eastern edge of the property would continue to be managed as farmland after restoration activities have been completed (Figure 2).

2.3 Proposed Action

The intent of the proposed action is to create and enhance approximately 25.1 acres of seasonal wetland and upland habitat distributed across two parcels that were formerly used for agriculture. The proposed action would enhance habitat conditions favorable to wetland and riparian dependent species and would restore adjacent upland habitats.

2.3.1 Site Preparation

Site preparation activities would be required to ensure the successful establishment of plant material and to prohibit the establishment of high and moderate priority invasive plant species.

All vegetation on the project site was mapped in 2012 (Figure 3) and would be re-mapped prior to implementation of the project. In preparation of grading and planting seeds or transplants, the existing populations of native and desirable plants will be mapped and protected from project activities. Restoration activities are located outside of the extent of desirable vegetation as to retain stands of native plant species or preferred non-native plants. In addition, seasonal wetland, low seasonal marsh, high seasonal marsh, and willow scrub habitat areas will be largely preserved during restoration activities.

Additional soil preparation activities are necessary to reduce compaction and provide a proper seed bed for seed germination and transplantation. These preparation activities may include shallow ripping, chiseling, and ring rolling. Additional cultivation activities – prior to seeding or transplanting – could involve other implements such as flex-tine cultivators and finger-tine cultivators in order to reduce competition by non-native weeds. In areas where transplanting of container stock would occur, site preparation of greater intensity during the final cultivation would likely be required to facilitate use of mechanical transplant equipment, depending on site conditions.

For the purposes of this project, invasive plant species have been divided into high priority and moderate priority species. High priority species, such as jubata grass (*Cortaderia jubata*) or acacia (*Acacia* sp.), would continue to be removed regularly as they would have a detrimental effect on the habitat and would colonize substantial acreage on the site quickly. Moderate priority species are those which either currently exist on the site or are known to exist in relatively close proximity to the site and could have a detrimental impact on re-vegetation efforts, habitat quality, or surrounding land uses such as agriculture or conservation. Moderate priority species are those that are not known to colonize and out-compete native plants to the same degree as high priority species. Each species with a moderate ranking would be evaluated for control over time, and new priority species would be evaluated in coordination with surrounding land managers and growers in the region, and the California Invasive plant council published lists (http://www.cal-ipc.org/paf/).

2.3.2 Balanced Grading

The first element of the proposed restoration project includes grading four depression complexes of variable size, shape and depth. Depressions would have a minimum elevation of six feet above sea level and maximum depths of approximately four feet below natural grade. These elevations would allow each depression to completely drain or dry down during average rainfall years. The depressions would also have variable topography and gentle gradients (10h:1v maximum slope). The use of a high-resolution digital elevation model (DEM) and high frequency stage data has allowed for a constructed wetlands feasibility analysis under the current conditions and with future expectations of sea level rise and climate change. Both the size and depth of disturbance have been evaluated with the model as well as local data on seasonal shallow groundwater levels.

The 2014 grading plan, prepared by Waterways Consulting, Inc. (Waterways) shows a total cut volume of approximately 11,200 cubic yards, with a corresponding fill. These numbers reflect neat line quantities and have not been factored to reflect compaction or shrinkage. Where peat soils are encountered, compaction may be significant. The grading plan design incorporates flexibility to accommodate such variation by placing a significant percentage of this excess material within areas that are not critical to the function of the project (e.g., the southeast corner of the parcel). The design drawings are representative of the maximum potential volume of grading that may occur. Appendix D of this document provides final design drawings for the project.

All work would be located above the anticipated Watsonville Slough water level at the time of construction - thereby avoiding challenges related to dewatering or erosion and sediment control. The majority of the proposed work areas are internally drained, which greatly facilitates dewatering and erosion/sediment control. The contractor would be required to comply with all environmental protection measures contained in the project specifications and permit conditions, including preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

Construction would take place during mid-summer to early fall when the surface inundation and groundwater elevations are at a minimum. Discharge of water encountered in the excavations would be performed in a manner that prevents excessive turbidity from discharging into the slough channel. If pumping of groundwater is required, pumped water would be treated by filtration or retention, as necessary to meet water quality requirements.

2.3.3 Establishment

Establishment would involve the enhancement of three vegetation communities: seasonal marsh habitat, wet meadow habitat and native grassland habitat. The Vegetation Management Plan provides details on establishment of these three communities, which are summarized below, presented in Figure 2 and in Table 1.

- **Seasonal Marsh**: Seasonal marsh enhancement would be conducted between 7 and 8 feet elevation (NAVD88) and between 8 and 9 feet in elevation in areas which have been graded to lower the surface elevation as described in the grading plan. Most of the areas graded to between 7 and 8 feet in elevation are likely to receive surface floodwaters from the main slough

channel, and it is expected that water borne native plant seed would establish in those areas without planting, as has been seen in other similar areas on the property in the time since the agricultural field has been out of production. Those areas that surface waters are unlikely to reach would be re-vegetated with native plant material.

- **Wet Meadow**: Wet meadow enhancement is planned within the 8 to 11 foot elevation range and would provide high quality native wet meadow habitat within the existing ruderal wet meadows on site. Many of these areas would be subject to grading. Wet meadow enhancement work would include seeding and/or transplanting with site appropriate native plant material throughout the enhancement area. Seed which requires cold stratification for improved germination would be stratified prior to installation. Quickly colonizing plant species would be planted in a majority of the wet meadow enhancement area.
- **Native Grassland**: Native grassland restoration is planned within the 10 to 12 foot elevation range and would be located primarily within areas currently mapped as ruderal grassland habitat. These areas would also be disturbed by grading activities. Native grassland enhancement work would include seeding and/or transplanting with site appropriate native seed stock throughout the enhancement area. Seed that requires cold stratification for improved germination would be stratified prior to installation.

Table 1. Vegetation Types and Acreages

Vegetation Type	Existing Acreage	Acres Enhanced During Implementation of the Project	Acres Restored During Implementation of the Project	Total Acres on the Property after Project Implementation
High Seasonal Marsh (Coastal and Valley Freshwater Marsh)	4.2 acres	4.2 acres	3.4 acres	7.6 acres
Low Seasonal Marsh (Coastal and Valley Freshwater Marsh)	0.0 acres	0.0 acres	2.8 acres	2.8 acres
Ruderal Wet Meadow / Wet Meadow	10.7 acres	1.8 acres	6.5 acres	8.3 acres
Ruderal Grassland / Native Grassland	4.9 acres	0.4 acres	1.3 acres	1.7 acres
Willow scrub (Central Coast Riparian Scrub)	4.5 acres	3.9 acres	0.0 acres	3.9 acres
Ag. Water recycling	4 acres	-	-	4 acres
Ag. Buffer	0.9 acres	-	-	0.9 acres
Total	29.2 acres	10.3 acres	14 acres	29.2 acres

Enhanced habitat acreages include acres of existing vegetation in which the habitat quality is improved.

Restored habitat acreage includes areas of the property in which agricultural production is removed and native habitat is restored.

2.3.4 Irrigation Contingency

In areas where seeding is used a normal rainfall year would provide sufficient soil moisture for successful establishment of plant material. However, in the event of a dry year, the project includes an irrigation component, which may be required for areas with young transplants or under drought conditions. If large scale irrigation is needed, then irrigation of container stock may be conducted with sprinklers and/or drip irrigation by pumping groundwater from the well on site, or that of a neighboring farm. A water truck may also be used for irrigation.

2.3.5 Seed and Container Installation

All plant material would be collected from parent material within the Pajaro River watershed or Monterey Bay bioregion to the maximum extent possible. Locally-sourced plant material will be most adapted to on-site conditions in the short-term and provide for long-term resiliency. Plant species were chosen by ecologists for their phenological abilities to self-propagate and spread aggressively by either seed or rhizome, in order to compete with the high presence of undesirable species on site.

Installation would consist of typical methods such as seeding or hand planting but could also consist of commercial methods used in agricultural settings such as semi-automated mechanical planting involving the use of tractor and specialized attachment. Use of automated planting equipment would be limited to when conditions of the riparian areas and seasonal wetlands are dry within the project site (to avoid potential impacts to dispersing amphibians). The specific plant pallet and numbers would be determined based on seed and plant stock availability and with prior approval from USFWS staff on final plant species list to be used on project.

2.4 Maintenance

Proposed maintenance practices include various weeding techniques, mowing, flaming and herbicide application. A broadleaf-specific herbicide would be used to remove invasive forb species and establish native grass cover, if necessary. All maintenance practices would occur outside of areas with surface water inundation and outside of areas with saturated soils. A 50 foot buffer would be provided to all areas with surface water inundation for most maintenance measures. Anticipated maintenance methods are described in more detail below.

2.4.1 Flame-torch Weeding

Flame torch weeding can eliminate dicot species (forbs) while preserving monocot species (grasses) due to the relative position and growth of meristem tissue. Depending on the weather and access to the site, a tractor mounted flame torch weeder or hand torch may be used after early rains for control of broadleaf weeds, such as bristly ox-tongue (*Helmenothica echoides*) and bull thistle (*Circium vulgare*).

2.4.2 Mowing

Mowing would promote root development over vegetative growth; favoring perennial plants not reliant on annual seed set and would reduce mowing needs in subsequent years. Some non-native plants are considered compatible with the goals of the re-vegetation effort, including non-native annual grasses and non-invasive, non-native forb species.

Mowing would be conducted with a tractor mounted mower set 4 to 8 inches above the ground, and would typically be limited to two mowing treatments per year. Weed whacking would be used in lieu of mowing when treatment areas are small in size or inaccessible by mowing equipment, and would also typically be limited to two treatments per year.

Manual labor methods such as hand-pulling and removal with hand tools would be used in situations where herbicide or mechanical methods are not practical, efficient, or allowed. These situations would include but are not limited to combatting invasive plants when: buffer zones are established around standing water in the project site, desirable flora may be negatively impacted by equipment or herbicides, and when low density of undesirable plants does not justify the use of mechanical or chemical removal methods.

2.4.3 Herbicide Application

Use of a broadleaf herbicide in conjunction with native grass seeding has been shown to effectively establish high percent cover of native grass species and effectively control undesirable broadleaf weeds. Herbicides may be used for up to two years following planting, with exceptions determined by the adaptive management process described below, and in compliance with all regulatory permits and authorizations.

Herbicides described throughout this biological assessment are specifically requested by the project applicant to combat specific weed pests that are expected to occur. Specific herbicide formulations which include trade names are needed to provide adequate information to the consulting agency so that the appropriate effects determinations can be made. No endorsement of named products by the Land Trust is intended.

The herbicides that could be used in the Bryant-Habert / Wait Ecological Restoration Project include: Aminopyralid (Milestone®); Triclopyr (Garlon 3A®); Imazapyr (Habitat®); and Glyphosate (Rodeo®). The surfactant Agridex® would be used with all of the herbicides listed above.

Definitions:

LD50 - the dose required to kill 50 percent of a population of test animals (birds and mammals), expressed in milligrams per kilogram of bodyweight (mg/kg-bw).

LC50 - the environmental concentration that is required to kill 50 percent of a population of test animals (aquatic species), expressed in milligrams of acid-equivalent per liter (mg a.e./L) which also equates to parts per million (ppm).

Risk Quotient (RQ) - calculated by dividing the exposure (EEC) by the toxicity (LD50 or LC50).

$$\text{Risk Quotient} = \frac{\text{Estimated Environmental Concentration (e.g.EEC)}}{\text{Toxicity Test Effect Level (e.g., } LC_{50}, LD_{50}, \text{ NOAEC)}}$$

Estimated Ecological Concentration (EEC) - the worst case estimated pesticide concentration in the environment when applied per label instructions.

Environmental Concentration (EC) – the actual measured concentration of an active ingredient (mgAI/L) in the environment.

Level of Concern (LOC) - used to interpret the risk quotient and to analyze potential risk to non-target organisms and the need to consider regulatory action.

The U.S. Environmental Protection Agency (EPA) has developed standardized methodologies to evaluate the toxicity of herbicide formulations on the environment and on groups of species. Laboratory and field study data are used to conduct Ecological Risk Assessments; a process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors (i.e. herbicides). These assessments determine the EEC and acute toxicity endpoints for terrestrial species (LD50) and aquatic species (LC50) that are derived from laboratory tests using surrogate species. Risk Quotients are then calculated by dividing the exposure (EEC) by the toxicity (LD50 or LC50). The resulting RQ is then compared to the Level of Concern (LOC); the level at which the RQ should not exceed for a given group of animals or plants (Appendix B). As a precautionary measure the EPA has lowered the LOC for endangered species by a factor of five for birds and mammals and a factor of ten for aquatic animals.

Five ecotoxicity categories for terrestrial and aquatic organisms have been identified based on the worst case estimated environmental concentration (EEC) as if the herbicide been applied directly to the water surface. These value ranges from “Very Highly Toxic” to “Practically Nontoxic” The worst case ecotoxicity value is then compared to the LD50 or LC50 values and a determination is made on the likely toxicity of the herbicide on an individual. When the actual environmental concentration (EC) of an herbicide is known, the EEC value can be replaced with the EC to get a better measure toxicity.

Imazapyr

Imazapyr is a systemic non-selective herbicide that can be applied to water, soil, or post-emerging plants for control of most annual and perennial weeds including grasses, broadleaves, vines, brambles, brush, trees, and floating or submerged aquatic weeds. At normal use rates imazapyr is highly toxic to targeted plants however it is s “practically non-toxic” to fish, birds, mammals, and aquatic organisms.

Imazapyr is produced by several manufactures and is available in many formulations which may include other herbicides, surfactants, or spreaders. Due to the toxicity of non-herbicidal constituents to fish and aquatic species, manufacturers produce surfactant-free formulations of imazapyr (Habitat and Arsenal) that are labeled for use in aquatic habitats that are “practically non-toxic” to mammals, aquatic vertebrates, aquatic invertebrates, and amphibians. Trumbo and Waligora (2009) found the LC50 of amphibians exposed to Habitat to be exceptionally high (1,739 mg a.e./L, ppm) and “practically non-

toxic" per the EPS's ecotoxicity ranking. Even when applied directly to *Spartina densiflora* and water at the maximum labeled application rate of 96 oz/acre, the maximum concentration of Habitat was 0.4 mg a.e./L; a concentration well below the LC50 of 1,739 mg a.e./L (Trumbo and Waligora 2009) and with a resulting RQ of 0.0002 which is orders of magnitude below the LOC for aquatic animals. Imazapyr is highly soluble in water with a half-life of 2-3 days but does not sorb to soil and can persist in soil much longer (half-life 25-142 days) controlling weeds up to two years (Shaner 2014). Imazapyr does not bio accumulate or move up the food chain. Based upon these data, there is a low potential for California red-legged frogs to become killed or injured as a result of exposure to imazapyr that would be used in the project (the likely routes of exposure that are estimated to be the most toxic to amphibians are absorption through the skin or ingestion). Additionally, avoidance and minimization measures would be in place to further reduce the potential for California red-legged frogs to become exposed and be killed or injured as a result.

Aminopyralid

Aminopyralid is a systemic broadleaf-specific herbicide that can be applied up to the water's edge, soil, or post-emerging plants for control of most annual and perennial broadleaf weeds including vines, brambles, brush, and trees. At normal use rates aminopyralid does not adversely affect most annual or perennial grasses by post-emergent applications. Toxicity to targeted plants is very high while its effect to fish, birds, and mammals is "practically non-toxic" but may be "slightly toxic" to some aquatic organisms.

Milestone VM is a surfactant-free aminopyralid herbicide that is labeled for use in uplands but can also be applied to seasonally dry wetlands, floodplains, and lowlands up to the water's edge (Specimen Label – Milestone VM, available on request). Henry et al. (2003) found the LC50 of larval amphibians exposed to aminopyralid to be high (>95.5 mg a.e./L, 95.5 ppm), which is on the extreme high limit of the "slightly toxic" EPA ecotoxicity category. Syracuse Environmental Research Associates (SERA) calculated the acute and long-term surface water concentration of aminopyralid using a typical application rate of 0.078 lbs./acre and the standardized rate of 1.0 lbs. a.e./acre (SERA 2007). The resulting upper-limit contamination rates were 0.0468 mg/L and 0.6 mg/L respectively; well below the "practically nontoxic" level of 100 mg/L or 100 ppm. When the standardized rate used by SERA (1.0 lbs. a.e./acre) is normalized to the maximum application rate of 0.11 lbs. a.e./acre the revised environmental concentration of aminopyralid is expected to be 0.066 mg/L (0.6mg/L x 0.11 = 0.066 mg/L); orders of magnitude below the "practically nontoxic" level of 100 ppm and with a resulting RQ of 0.006 which is orders of magnitude below the LOC for aquatic animals.

Water solubility of aminopyralid is highly variable ranging from 203-212 g/L in buffered solutions to 2.48 g/L in un-buffered solutions (Shaner 2014). Aquatic persistence of aminopyralid is highly variable in relation to the mode of degradation. In aquatic systems, the primary route of degradation is photolysis, where a laboratory experiment yielded a half-life of 0.6 days in clear shallow water. In aerobic sediment-water systems, degradation proceeded slowly, with observed total system half-lives of 462 to 990 days (U.S. EPA 2005). Two field dissipation studies were performed (in California and Mississippi). The results indicate that aminopyralid is likely to be non-persistent and relatively immobile in the field. Half-lives of 32 and 20 days were determined, with minimal leaching below the 15 to 30 cm horizon

depth (U.S. EPA 2005). Although it is weakly sorbed to soil aminopyralid becomes more tightly bound to soil particles over time and becoming less mobile and remained in the top 30 cm of the soil profile (Shaner 2014).

Based upon these data, there is a low potential for California red-legged frogs to become killed or injured as a result of exposure to Milestone VM that would be used in the project (the likely routes of exposure that are estimated to be the most toxic to amphibians are absorption through the skin or ingestion). Additionally, avoidance and minimization measures listed in Appendix B would be implemented to further reduce the potential for California red-legged frogs to become exposed to Milestone VM used in the LMC Restoration Project, and killed or injured as a result.

Triclopyr

Triclopyr is a broadleaf-specific herbicide designed to kill woody plants and broadleaf weeds species but not grasses. It is highly toxic to targeted plants but is slightly toxic to fish and mammals. Triclopyr is created as a triclopyr-ester and triclopyr-amine and is available in many formulations which may include other non-herbicidal constituents, other herbicides, surfactants, or spreaders.

Garlon 3A is a triclopyr-amine formulation and contains non-herbicidal constituents in its formulation that make it more toxic than triclopyr alone and is not labeled for use in aquatic habitats (Trumbo and Waligora 2009). Garlon 3A was “slightly toxic” to mammals upon ingestion, “practically non-toxic” to aquatic vertebrates, and “slightly toxic” to the most sensitive aquatic invertebrates (U.S. EPA 2009). Trumbo and Waligora (2009) found the LC50 of amphibians exposed to Garlon 3A to be very high (174.5 mg a.e./L, “practically non-toxic” per EPA terminology). When used at the maximum label application rate of 10.72 L/hectare, the EEC of Garlon 3A was 2.56 mg a.e./L (Perkins et al. 2000); a concentration well below the LC50 of 174.5 mg a.e./L. and with a resulting RQ of 0.01 which is five of magnitude below the LOC for aquatic animals. In clear water during summer at midday under conditions with intense sunshine, triclopyr was estimated to have a half-life of 2.1 hours at the surface and 2.8 hours at 1 meter below the surface (McCall and Gavit 1986). In sediment, triclopyr had a half-life of 2.8 to 5.8 days (Petty et al. 2003).

Based upon these data, there is a low potential for California red-legged frogs to become killed or injured as a result of exposure to Garlon 3A that would be used during project implementation (the likely routes of exposure that are estimated to be the most toxic to amphibians are absorption through the skin or ingestion). Additionally, avoidance and minimization measures would be in place to further reduce the potential for California red-legged frogs to become exposed to Garlon 3A and killed or injured as a result.

Glyphosate

Glyphosate is a non-specific post emergent herbicide that kills both broadleaf and grass plant species; it is highly toxic to plants but has exceptionally low toxicity to birds, fish, and mammals.

Rodeo is a glyphosate herbicide that is labeled for use in aquatic habitats and does not include a surfactant in its formulation. Rodeo was “practically non-toxic” to birds, fish, and mammals (U.S. EPA 2008). Glyphosate herbicides that are labeled for use in aquatic habitats are very low in toxicity to

amphibians. Perkins et al. (2000) found the LC50 of amphibians exposed to Rodeo to be extremely high (5,407 mg a.e./L, "practically non-toxic" per EPA terminology), which has an inverse relation to the toxicity of the chemical. When used at the maximum label application rate of 12 Liters/hectare, the expected ecological concentration (EEC) of Rodeo in aquatic sites was 2.8 mg a.e./L, a concentration well below the LC50 of 5,407 mg a.e./L (Perkins et al. 2000) and with a resulting RQ of 0.0005 which is orders of magnitude below the LOC of aquatic animals. Glyphosate herbicides that are labeled for use in aquatic habitats are highly soluble in water and therefor dissipate quickly in water (Feng et al. 1990). Glyphosate herbicides bind tightly with soil particles and once absorbed to soil particles become immobile in the environment (Feng et al. 1990). Microbial degradation is the main path of breakdown in water and on soil (Shaner 2014). Under various degradation mechanisms glyphosate had a half-life of 1.8 days to 3.4 days in aerobic soil, 7 days in aerobic sediment, and 8 to 199 days in anaerobic sediment (U.S. EPA 2008).

Based upon these data, there is a low potential for California red-legged frogs to become killed or injured as a result of exposure to Rodeo that would be used during implementation of the project (the likely routes of exposure that are estimated to be the most toxic to amphibians are absorption through the skin or ingestion). Additionally, avoidance and minimization measures would be in place to further reduce the potential for California red-legged frogs to become exposed to Rodeo and killed or injured as a result.

Surfactants

Surfactants are used to improve the effectiveness of herbicides by reducing surface tension and increasing chemical penetration into the plant tissue. Some surfactants have been shown to be toxic to fish and aquatic species. The surfactant polyehtoxylated tallowamine (POEA) found in Roundup has been linked with higher amphibian mortality rates than with surfactant-free glyphosate (Perkins et al. 2000). Only non-ionic surfactants or surfactants that are classified as practically non-toxic to aquatic organisms would be used; AgriDex would be the surfactant used on this project. In a review of 36 nonionic surfactants used with glyphosate, the Service noted that Agri-Dex showed the least acutely toxicity to aquatic invertebrates, fish and amphibians and does not contain suspected endocrine disruptors.

Chytrid fungus is a water-borne fungus that is spread through direct contact between aquatic animals and by spores that are able to move short distances through water. The fungus attacks the thickened parts of an animal's skin that have keratin, such as the mouthparts of tadpoles and the toes of adults. This fungus can decimate amphibian populations by causing fungal dermatitis. Infection typically results in death within 1 to 2 weeks, but not before infected animals can spread the fungal spores to other aquatic species, ponds, and streams. Once a pond or waterway has become infected with chytrid fungus, it is unknown how long the fungus would persist. Chytrid fungus could be spread if infected California red-legged frogs are relocated and introduced into areas with healthy populations. It is also possible that contaminated equipment or clothing could introduce chytrid fungus into areas where it did not previously occur. If this occurs in the action area, many California red-legged frogs could be affected. The possible spread of chytrid fungus would be minimized by following the Declining Amphibian Populations Task Force's Fieldwork Code of Practice (Appendix C).

The proposed action could affect a small number of California red-legged frogs, if any, occurring or transitioning across the work area. Because of the small size of the work areas and the fact that the Land Trust agrees to use the protective measures described in the project description section of this document, we anticipate that few, if any, California red-legged frogs are likely to be killed or injured during this work. Although there may be short-term adverse effects on individual California red-legged frogs, long-term benefits are expected due to the planned habitat restoration and cessation of farming operations.

2.5 Monitoring

Adaptive management, or monitoring, of the restoration is necessary to meet project goals and to remain consistent with the project goals to protect, expand, and enhance habitat for native plant and wildlife species. To this end, the proposed project includes adaptive management tools that may be implemented for monitoring, evaluation, and determination of subsequent actions. During a seven year period of time, the pond hydroperiod would be monitored and adaptively managed to verify that constructed depressions dry down completely during low water years. Similarly, monitoring of invasive species and an assessment of their priority rank where necessary would be conducted to enable management of high and moderate priority species. Finally, monitoring of areas that were not planted may be conducted to compare them to planted areas to determine whether additional plantings would be beneficial.

Table 2. Adaptive Management of Constructed Ponds

Decrease Hydroperiod	Increase Hydroperiod
▪ Breach berm in select locations to reduce depression storage volume ▪ Backfill depressions to reduce depth ▪ Construct swale to drain depression towards existing slough channel	▪ Excavate depressions deeper to increase storage volume and the potential for groundwater influence ▪ Construct swale and berm to direct surface runoff towards depression

(Source: Waterways 2014)

Similarly, monitoring of invasive species and an assessment of their priority rank where necessary would be conducted to enable management of high and moderate priority species. In general, areas that exceed the percent cover metric for high and moderate priority invasive plant species would be treated by one of the maintenance methods described above to reduce the invasive plant species present. Finally, monitoring of areas that were not planted may be conducted to compare them to planted areas to determine whether additional plantings would be beneficial. All adaptive management actions would be conducted in a manner consistent with regulatory permit conditions and County requirements for minimizing impacts to sensitive habitats and species.

3.0 Avoidance and Minimization Measures

The following conservation measures, in addition to the maintenance restrictions described above, will be implemented by the Land Trust and their contractors to avoid or minimize adverse effects to California red-legged frog.

1. The Land Trust will ensure that the Service-approved biologist or designated monitor will be given full authority to stop work if the avoidance and minimization measures listed below are not being followed. If work is stopped, the Service will be notified immediately.
2. A Service-approved biologist will conduct a pre-construction survey of the project site no sooner than 48 hours prior to onset of work activities. If any life stage of California red-legged frog is found and an individual(s) is likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move the individual(s) from the site before work activities begin. The Service-approved biologist will relocate such California red-legged frog(s) the shortest distance possible to a location that contains suitable habitat and that will not be affected by activities associated with the project. The Service-approved biologist will maintain detailed records of any California red-legged frog(s) that is relocated (e.g., size, coloration, any distinguishing features, and photographs) to assist in determining whether a translocated individual(s) is returning to the original point of capture.
3. Prior to construction activities, a Service-approved biologist will conduct an Employee Education Program for the construction crew. The biologist will meet with the construction crew prior to the onset of construction to educate the construction crew on the following: (1) a review of the project boundaries, including staging areas and access routes; (2) the special-status species that may be present, their habitat, and proper identification; (3) how to avoid any special-status species that is encountered within the project site and report its presence to the Service-approved biologist; and (4) these avoidance and minimization measures as prescribed in this biological assessment.
4. A Service-approved biologist will be present at the work site until all ground-disturbing activities are completed. After this time, the Service-approved biologist will monitor the project area for compliance with all avoidance and minimization measures, or the Service-approved biologist will designate a person to monitor the project area for compliance with all avoidance and minimization measures if the Service-approved biologist will not be present. The Service-approved biologist will ensure that this monitor receives sufficient training in the identification of California red-legged frogs. The designated monitor must have experience and a background in natural resources.
5. On any day that ground-disturbing activities, mowing or weed whacking, or herbicide spraying are planned to occur, a Service-approved biologist will conduct a survey for California red-legged frogs in potentially affected areas before the work begins. If any life stage of California red-legged frog is found and an individual(s) is likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move the individual(s) from the site before work activities begin. The Service-approved biologist will relocate such California red-legged

frog(s) the shortest distance possible to a location that contains suitable habitat and that will not be affected by activities associated with the project. The Service-approved biologist will maintain detailed records of any California red-legged frog(s) that is relocated (e.g., size, coloration, any distinguishing features, and photographs) to assist in determining whether a translocated individual(s) is returning to the original point of capture.

6. If a California red-legged frog(s) is observed during ground-disturbing activities, the Service-approved biologist will stop work in that area. The Service-approved biologist will relocate the California red-legged frog as described above.

7. Ground-disturbing construction activities, herbicide applications, mowing and weed whacking will only occur during the period from May 1 through October 31 provided that standing water has been absent from the site for at least 30 days.

8. If standing water is anticipated to remain on the project site after June 15th during any year of the project, the Land Trust will contact the Service for approval to conduct spraying, mowing or weed whacking, if needed to prevent seed set of non-native plants. Under these circumstances, the Land Trust will seek approval from the Service at least 2 weeks in advance of the desired start of any mowing or weed whacking. At that time the Land Trust and Service will discuss the need for additional conservation measures. Additional conservation measures could potentially include the following: (1) work will only occur if no California red-legged frogs are found during a pre-activity survey conducted by a Service-approved biologist; (2) a clearly demarcated buffer area of at least 50 feet will be established around any standing water; (3) only weed whacking and hand-pulling could occur within the buffer area; (4) the Service-approved biologist will remain onsite when any activities are conducted within the buffer area; (5) the Service-approved biologist will stop all work if a California red-legged frog(s) is found on the project site; (6) the Land Trust will ensure the vegetation height is not cut below 18 inches within the buffer area; and/or (7) no activities will occur within standing water. Once the project site has been free of standing water for at least 30 days, mowing or weed whacking could continue without the need for additional conservation measures. If mowing or weed whacking is not approved by Service when standing water is present, then no mowing or weed whacking will occur until there is no standing water for at least 30 days.

9. To prevent inadvertent entrapment of California red-legged frogs during the proposed project, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered at the close of each working day with plywood or similar materials. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals.

10. If silt fencing is required per erosion control Best Management Practices, only high-quality reinforced silt fencing will be used and efforts will be made to install it in a way that does not inhibit movements of California red-legged frogs. Openings will be created approximately every 100 feet.

11. Cleaning and refueling of equipment and vehicles will occur only within designated staging areas on previously paved or graded parking areas. All herbicides, fuels, lubricants, and equipment will be stored, poured, or refilled at least 50 feet from wetland habitat, riparian habitat or water

bodies in a location where a spill will not drain directly toward aquatic habitat. No maintenance or cleaning of equipment will occur within wetland or riparian areas, or within 50 feet of such areas. All equipment and vehicles will be checked and maintained on a daily basis to ensure proper operation and avoid potential leaks or spills.

12. During construction, all project-related spills of hazardous materials within or adjacent to the project site will be cleaned up immediately. Spill prevention and clean-up materials will be onsite at all times during construction. Construction materials/debris will also be stored within the designated staging areas. No debris, soil, silt, sand, oil, petroleum products, cement, concrete, or washings thereof will be allowed to enter into, or be placed where they may be washed by rainfall or runoff, into wetland or riparian habitats.
13. Prior to the onset of work, the NRCS will ensure that a plan is in place for a prompt and effective response to accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
14. Only a licensed herbicide contractor with experience working on habitat restoration sites along the Central California Coast will perform all applications of herbicides.
15. Herbicide application will be made in accordance with label recommendations. The Land Trust and the licensed herbicide contractor will implement the pesticide best management practices described in Appendix B. Persons applying herbicide will wear all required personal protective equipment and follow safety protocols and measures.
16. Only those herbicides or surfactants specifically identified in the project description will be used.
17. Containers of herbicide (concentrated or diluted) will be under direct supervision of the herbicide applicator at all times.
18. Sprayers, chemicals, and mixing equipment for herbicides will be contained in non-tip, leak-proof containers at all times, except when contents are being used or accessed.
19. Only enough herbicide will be mixed for the immediate application; however, if there is excess, the herbicide will be disposed of according to Environmental Protection Agency and California Department of Pesticide Regulation regulations.
20. Herbicides used at the site will be used according to all best management practices, precautions, and recommendations listed on the label. To reduce potential impacts of spraying operations on California red-legged frog, no herbicide applications will occur on the project site within 30 days of the last standing water within the swale system. One treatment per year for the first two years will be accomplished using boom spray equipment attached to an ATV or wheeled tractor. However, for all herbicide applications, precedence will be given to spot treatments (with the use of marking dye) over full-coverage applications; minimizing the potential harmful effects to wildlife and the environment.
21. Herbicide applications will not occur in wind conditions exceeding 7 miles per hour or when rain is forecasted within 72 hours of treatment.

22. Only non-ionic surfactants (e.g. Agri-Dex) or surfactants that are not toxic to fish and wildlife will be used on the project site. No surfactants containing polyehtoxylated tallowamine (POEA) will be used on the project site.
23. All trash that may attract predators will be properly contained, removed from the project site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.
24. The Service-approved biologist(s) will follow the Declining Amphibian Populations Task Force's Code of Practice (Appendix C). The Service-approved biologist may substitute a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water) for the ethanol solution.

The Land Trust proposes that Kelli Camara (RCDSCC), Johnathan Pilch (Watsonville Wetlands Watch) and Cameron (Cammy) Chabre (Land Trust) be approved by the Service as the Service Approved Biologist for this project. The Service Approved Biologist will have the authority to designate project monitors as needed without Service approval. The Service-approved biologist will ensure that this monitor receives sufficient training in the identification of California red-legged frogs. The designated monitor must have experience and a background in natural resources.

4.0 Environmental Baseline

4.1 Biological Setting

Before being modified for agriculture in the early 1900s, the site likely contained a matrix of grasslands, seasonal wetlands, perennial open water "backwater lake" features, and tidal marsh. From the early 1900s until 2007 a portion of the site, south of Watsonville Slough, was used for farming. The site is no longer used for agricultural purposes, but portions of the site are annually disked. The project site currently consists of remnant agricultural habitat that lies near the floodplain confluence of Watsonville and Hanson Sloughs, where uncontrolled floodwaters partially or entirely inundate the site. Flooding occurs during the rainy season (which is why the site conditions are not well suited to farming) and flood waters typically recede in May.

The current composition of plant communities on the Bryant-Habert and Wait parcels includes low seasonal marsh, high seasonal marsh, ruderal wet meadow, willow scrub, and ruderal grassland habitat (Figure 3). These vegetation communities are largely a factor of surface water conditions, ground water conditions, historic seed bank and distribution of seed from surrounding seed sources. The current configuration of the wetland habitat within the 46 acre property includes 23.1 acres of jurisdictional wetlands and waters of the U.S., as defined by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act.

Several landscape features from the historical farming practices remain on the property, including the Watsonville Slough maintenance channel, the Struve Slough maintenance channel, an underground

irrigation network and an agricultural production well. In 2010, a permanent floodplain easement was established with the United States Department of Agriculture Natural Resource Conservation Service (NRCS) on the northern part of the property and select areas within the easement south of the Watsonville Slough channel were planted with native vegetation at that time.

4.2 California Red-legged Frog

The federally threatened California red-legged frog (*Rana draytonii*) is known to occur in the Watsonville Slough system although CNDDB observation records are limited and extend back only to 1990 when more than 10 adults were first documented in the East Branch of Hanson Slough. In 1999, 10 subadults were documented on the property adjacent to the Bryant-Habert parcel in the agricultural ditch next to the railroad tracks and one dead adult was discovered at the Harkins Slough railroad crossing. Upstream, or east, of Highway 1, two individuals were observed in 2001 in Struve Slough near Tarplant Hill and one adult was observed in 2004 in Watsonville Slough at the Harkins Slough Road crossing near Ramsey Park.

Biologists Gary Kittleson of Kittleson Environmental Consulting (KEC), Bryan Mori of Bryan Mori Biological Consulting Services (BM) and Mark Allaback of Biosearch Associates (BA) conducted summer season presence/absence surveys and daily monitoring for the federally threatened California red-legged frog for the three slough-crossing bridges on Harkins Slough Road. During the monitoring period (2004-2007) biologists found no frogs in the sloughs upstream of Highway 1. In 2004, 15 California red-legged frogs were relocated from the Harkins Slough Road crossing at West Branch Struve Slough (1.2 miles from the project site) and in 2005, 12 individuals were relocated from the Lee Road crossing (0.75 mi. from the project site).

With authorization from USFWS, breeding season surveys at the Watsonville Slough Farms and Bryant-Habert property began in 2007 by KEC, BA and BM. Initially, two agricultural ponds within 0.1 mile of the project site were sampled and the lower pond was found to support small numbers of egg masses (1-2) and larvae (<5) each year and have since become known as the "breeding ponds." Since then, scattered non-breeding season observations of adults, sub adults and metamorphs were documented from the breeding ponds and the nearby Watsonville Slough ditch, riparian willow stand and railroad crossing culverts (both upstream and downstream).

USFWS Protocol surveys were conducted during winter and early spring of 2013 and, due to drought, limited breeding season surveys were done in 2014. Areas surveyed by KEC, BA and BM on the Watsonville Slough Farms and Bryant-Habert properties include Chivos Pond, Upper Hansen Slough, Middle Watsonville Slough, Lower Harkins Slough, the willow riparian habitat at the culvert crossing and the wetland habitat along the rail line. The two established ”breeding ponds” north of the project site on the Watsonville Slough Farm property provide breeding habitat for California Red-legged frog in most years.

Breeding activity has also been confirmed in the main Bryant-Habert/Watsonville Slough ditch line at the railroad crossing and in middle Watsonville Slough, adjacent to the proposed project site. Breeding activity has been documented, but not confirmed in Lower Harkins Slough and the Harkins Slough wetland habitats along the rail line. Limited 2013 California Red-legged frog breeding activity was also

detected in the upper east branch of Hanson Slough, but no egg masses or larvae were detected. Summer season observations of adult and sub-adult California Red-legged frog have been documented from Chivos Pond, the breeding ponds at the railroad crossing and the Watsonville Slough ditch upstream of the railroad crossing (KEC 2012; KEC 2013).

Elsewhere in the lower Pajaro Valley, California red-legged frogs have been observed at 19 distinct locations in the Pajaro River downstream of Murphy Crossing since 2009. They are also known from Ellicott Slough (3.0) mi. northwest of the project site, the headwaters of Corralitos Creek at Grizzly Flat (10 mi. north) and the Elkhorn Slough system to the south.

Bullfrog (*Rana catesbeiana*) and tree frog (*Pseudacris regilla*) larvae are known to be present in Chivos Pond, Middle Watsonville Slough (especially the Bryant Habert ditch line), Harkins and Hansons Slough, and are now consistently present in the established California Red-legged frog breeding ponds. Predatory fish species that are known to be present in the study area include Non-native carp (*Cyprinuscarpio*), brown bullhead (*Ictalurus nebulosus*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*) and Native Sacramento blackfish (*Orthodon microlepidotus*) (KEC 2012; KEC 2013).

4.2.1 California Red-legged Frog Critical Habitat Unit SCZ-2

This Critical Habitat Unit is located along the coastal plain in southern Santa Cruz County, north of the mouth of the Pajaro River and seaward of Highway 1. It includes locations in the Watsonville Slough system, including all or portions of Gallighan, Hansons, Harkins, Watsonville, Struve, and the West Branch of Struve sloughs. SCZ–2 contains the following features that are essential for the conservation of the subspecies: Aquatic habitat for breeding and nonbreeding activities and riparian habitat for foraging and dispersal activities. SCZ–2 provides connectivity between occupied sites along the coast and further inland. In addition, it contains permanent and ephemeral aquatic habitats suitable for breeding and riparian areas for dispersal, shelter, and food (USFWS 2010).

The primary constituent elements (PCE) for California red-legged frogs are aquatic and upland areas where suitable breeding and non-breeding habitat is interspersed throughout the landscape, and are interconnected by continuous dispersal habitat. Specifically to be considered to have the PCE an area must include two (or more) suitable breeding locations, a permanent water source, associated uplands surrounding these water bodies up to 300 feet from the water's edge, all within 1.25 miles of one another and connected by barrier-free dispersal habitat that is at least 300 feet in width (USFWS 2010). Table 3 lists the PCEs for the California red-legged frog and provides of summary of how the Bryant-Habert project site contains the PCEs.

In its current condition the project site provides a permanent water source and riparian habitat along a 650 meter (2,140 foot) stretch of Watsonville Slough. The upland habitat on the project site has been removed from intensive farming practices that required frequent ground disturbance activities such as disking and furrowing, thereby providing undisturbed upland habitat for this species. Breeding ponds are located in the main Bryant-Habert/Watsonville Slough ditch line at the railroad crossing and in middle Watsonville Slough, both of which are immediately adjacent to the project.

The project site provides permanent water and riparian habitat features that are essential for the conservation of the California red-legged frog. The site falls within the designated California red-legged frog critical habitat area but only represents less than 0.001 percent of the critical habitat designated in SCZ-2. Negative effects if any to critical habitat, would be temporary in nature and likely result in immediate and long-term benefits for the species and its habitat. Therefore, the function and conservation role of riparian habitat in SCZ-2 would be improved by the proposed enhancement activities in the long-term.

4.3 Santa Cruz Tarplant

The federally threatened Santa Cruz tarplant (*Holocarpha macradenia*) is known from the Watsonville Slough system. Santa Cruz tarplant has not been detected on the Bryant-Habert property and the nearest population is located one mile north at High Ground Organics where 205 plants were observed in 2007 (USFWS 2012). The soil type at the Bryant-Habert project site is Clear Lake clay, a soil that is not known to support Santa Cruz tarplant or the associated plant communities. Jonathan Pilch conducted surveys for this plant in September 2015 throughout the project site. Mr. Pilch did not detect Santa Cruz tarplant on the project site.

4.3.1 Santa Cruz Tarplant Critical Habitat

Critical habitat for the Santa Cruz tarplant was designated in 2002 when 2,902 acres were identified in Santa Cruz, Monterey, and Contra Costa counties as important for the conservation and recovery of the species. The PCEs for Santa Cruz tarplant consist of, but are not limited to soils associated with coastal terrace prairies, including the Watsonville, Tierra, Elkhorn, Santa Inez, and Pinto series; plant communities that support associated species, including native grasses such as *Nassella* spp. (needlegrass) and *Danthonia californica* (California oatgrass); native herbaceous species such as members of the genus *Hemizonia* (other tarplants), *Perideridia gairdneri* (Gairdner's yampah), *Plagiobothrys diffusus* (San Francisco popcorn flower), and *Trifolium buckwestiorum* (Santa Cruz clover). The PCE for Santa Cruz tarplant also includes the physical processes, particularly soils and hydrologic processes that maintain the soil structure and hydrology that produce the seasonally saturated soils characteristic of *Holocarpha macradenia* habitat (USFWS 2002).

The project area is immediately adjacent to but is not within the designated critical habitat for the Santa Cruz tarplant (USFWS 2002). It is unlikely that Santa Cruz tarplant would be present on the project area due to the historical intensive farming practices and non-compatible soil type.

Table 3. Primary Constituent Elements (PCE) for the California Red-legged Frog and Santa Cruz Tarplant

Primary Constituent Elements (PCE)	Functioning/Present
California Red-legged Frog Critical habitat for California red-legged frogs includes those areas possessing all of the primary constituent elements. The primary constituent elements for California red-legged frog include aquatic and upland areas where suitable breeding and non-	Suitable breeding pools and nonbreeding habitat is interspersed throughout the site. The site is bounded on the north by a

breeding habitat is interspersed throughout the landscape, and are interconnected by continuous dispersal habitat. Specifically to be considered to have the primary constituent elements an area must include two (or more) suitable breeding locations, a permanent water source, associated uplands surrounding these water bodies up to 300 feet from the water's edge, all within 1.25 miles of one another and connected by barrier-free dispersal habitat that is at least 300 feet in width. When these elements are all present, all other essential aquatic habitat within 1.25 miles, and free of dispersal barriers, will require at least informal consultations with the USFWS.	permanent water source (Watsonville Slough), which provides confirmed breeding habitat. Suitable upland areas are located within and adjacent to the project site.
Santa Cruz Tarplant The primary constituent elements or the Santa Cruz tarplant consist of, but are not limited to: soils associated with coastal terrace prairies, including the Watsonville, Tierra, Elkhorn, Santa Inez, and Pinto series; plant communities that support associated species, including native grasses such as *Nassella* spp. (needlegrass) and *Danthonia californica* (California oatgrass); native herbaceous species such as members of the genus *Hemizonia* (other tarplants), *Perideridia* gairdneri (Gairdner's yampah), *Plagiobothrys diffusus* (San Francisco popcorn flower), and *Trifolium buckwestiorum* (Santa Cruz clover); and physical processes, particularly soils and hydrologic processes, that maintain the soil structure and hydrology that produce the seasonally saturated soils characteristic of *Holocarpha macradenia* habitat.	No; not within designated critical habitat and project activities would not affect critical habitat adjacent to the site.

5.0 Effects of the Action

5.1 Santa Cruz Tarplant

Because the project site has a history of intensive farming and does not fall within designated critical habitat for Santa Cruz tarplant, we have determined that this project would not adversely affect the species and have no effect on its critical habitat. We anticipate that the project would create more suitable habitat for the Santa Cruz tarplant. Additionally, discontinuing intensive agricultural practices on the site will also promote insect pollinators, a factor noted as important to the species recovery when the Service designated critical habitat for the Santa Cruz tarplant (USFWS 2002). As native wetland and riparian habitats re-establish at the project site, qualified biologists will continue to survey for Santa Cruz tarplant during appropriate time frames of the annual species to ensure none occur in the work areas before weed control activities begin, if detected the Land Trust will not proceed with weed control activities until they have contacted the Service and identified how best to proceed with the weed control.

5.2 California Red-legged Frog

Direct effects to California red-legged frogs are anticipated and could include injury or mortality from being crushed, mortally struck, or severely injured by tilling equipment, construction equipment, mowing equipment, flaming activities, herbicide application, mechanical plant installations, construction debris, and worker foot traffic. These potential effects will be avoided by siting work activities to avoid

sensitive areas, such as potential breeding pools and isolated aquatic refuges, and scheduling the activities to occur outside of the breeding season. These effects will also be minimized by conducting awareness training sessions for workers to inform them of the presence and protected status of this species and the measures that are being implemented to protect California red-legged frog during project activities. Pre-activity surveys of work areas by USFWS-approved biologist will also minimize the probability of inadvertently crushing, striking, or injuring individual California red-legged frogs.

Direct effects to California red-legged frogs will also be reduced by relocating California red-legged frogs, if any are found, prior to the start of any of the proposed habitat enhancement activities. California red-legged frogs could be injured or killed if they are improperly handled or contained during capture and relocation efforts. California red-legged frogs that are relocated could suffer reduced fitness due to increased risk of predation, increased competition, or other factors associated with relocation to an unfamiliar environment. These effects will be reduced or prevented with the use of USFWS-approved biologists to capture and move the species to appropriate habitats.

Trash left during or after project activities could attract predators to work sites, which could, in turn, prey on California red-legged frogs. For example, raccoons (*Procyon lotor*) are attracted to trash and also prey opportunistically on California red-legged frogs. This potential effect would be reduced or avoided by careful control of trash at the work site.

Enhancement activities associated with swale and berm construction could cause increased siltation of the slough system downstream of the project site. By scheduling work activities to occur outside of the breeding season, any potential effects of increased sedimentation during the sensitive breeding phase of the species lifecycle would be minimized. Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade aquatic or upland habitat to a degree where California red-legged frogs are adversely affected or killed. Ensuring that refueling, maintenance, and staging of equipment takes place at least 200 feet from riparian habitat or water bodies would help reduce these threats.

Wetland plant establishment will be ongoing through 2023 and would require various maintenance activities per year which could include the following: ongoing plant installations; mowing and weed whacking of native and non-native vegetation; hand-pulling of invasive plants; flaming, and herbicide application to control invasive weeds (not exceeding 1 full application per year and follow-up spot treatments). These maintenance activities could cause direct impact to adult and sub-adult California red-legged frogs by crushing or injury from mowing, flaming or spray equipment and weed whacking equipment. Herbicide applications and flaming could cause direct or indirect injury or mortality to California red-legged frogs at all life stages. The project proponents will take precautionary and prudent actions to limit the potential impact of herbicide applications on California red-legged frogs by choosing herbicides that have the least toxicity to amphibian species (Appendix B), controlling spray drift, and timing applications when fewer California red-legged frogs are likely to be in the area.

The proposed action could affect a small number of California red-legged frogs, if any, occurring or transitioning across the work area. Because of the small size of the work areas and the fact that the Land Trust agrees to use the protective measures described in the project description section of this document and in Appendix C, we anticipate that few, if any, California red-legged frogs are likely to be

killed or injured during this work. Although there may be short-term adverse effects on individual California red-legged frogs, long-term benefits are expected due to the planned habitat restoration and cessation of farming operations.

5.3 Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological assessment. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Future Federal actions include the restoration of wetland, riparian, and upland habitat on an adjacent property that lies immediately downstream of the Bryant-Habert parcels. This project is called the LMC Project and construction may overlap in time with the proposed project. Construction of both projects during the same period could result in a potential cumulative effect on resources.

Under the LMC Project, the NRCS, through its Wetland Reserve Program (WRP), is in the process of acquiring a perpetual conservation easement on a 23-acre property owned and managed by LMC Properties, LLC. The LMC Project occurs within the Watsonville Sloughs system of Santa Cruz County, California and encompasses approximately 23 acres of farmland that was also recently used for row crop agriculture. As part of the WRP easement offer, the NRCS would provide the landowner additional funding to restore and enhance 9 acres of wetland habitat and 14 acres of riparian habitat within the perpetual easement of the LMC Project. The LMC Project is located approximately 0.5-mile west of the proposed project and contains un-vegetated and channelized reaches of the Watsonville Slough and Harkin Slough, and falls entirely within the floodplains of both sloughs. The goal of the habitat restoration, enhancement, and future management on the LMC Project is to reestablish wetland and riparian habitats that previously occurred at the site for the benefit of migratory birds, federally listed species, and a multitude of other native plant and wildlife species within the Watsonville Sloughs system. The LMC Project would provide benefits to two federally threatened species, the California red-legged frog and the Santa Cruz tarplant.

Similar to the proposed project, The LMC Project would result in temporary disturbance to upland habitat for California red-legged frog. However, no California red-legged frogs have been documented from the LMC site and the site currently does not contain suitable breeding habitat for this species. Construction impacts from both projects would be short-term during summer of 2016 and would involve only limited equipment and machinery. Both the proposed project and the LMC Project would require the project applicant implement minimization and avoidance measures (in addition all permit conditions from USFWS and CDFW) to reduce project impacts on special status species. All temporary construction related impacts associated with the both projects would be reduced to a less than significant level through implementation of these mitigation measures. Further, if individual frogs become displaced during construction activities, there is an abundance of suitable frog habitat located immediately adjacent to the project sites within the Watsonville Slough system. Long-term impacts to the Watsonville Slough Ecosystem from future wetland restoration projects, in combination with the proposed project, are anticipated to be cumulatively beneficial.

We are not aware of any non-Federal actions that are reasonably certain to occur in the action area.

6.0 Determination of Effects

Based on the information presented, we conclude that the Bryant-Habert / Wait Ecological Restoration Project is likely to adversely affect the California red-legged frog and critical habitat for this species. Minimization and avoidance measures will require pre-construction surveys. Ground-disturbing construction activities will be limited to the period from May 1 through October 31 to reduce the likelihood of encountering California red-legged frogs in the project site.

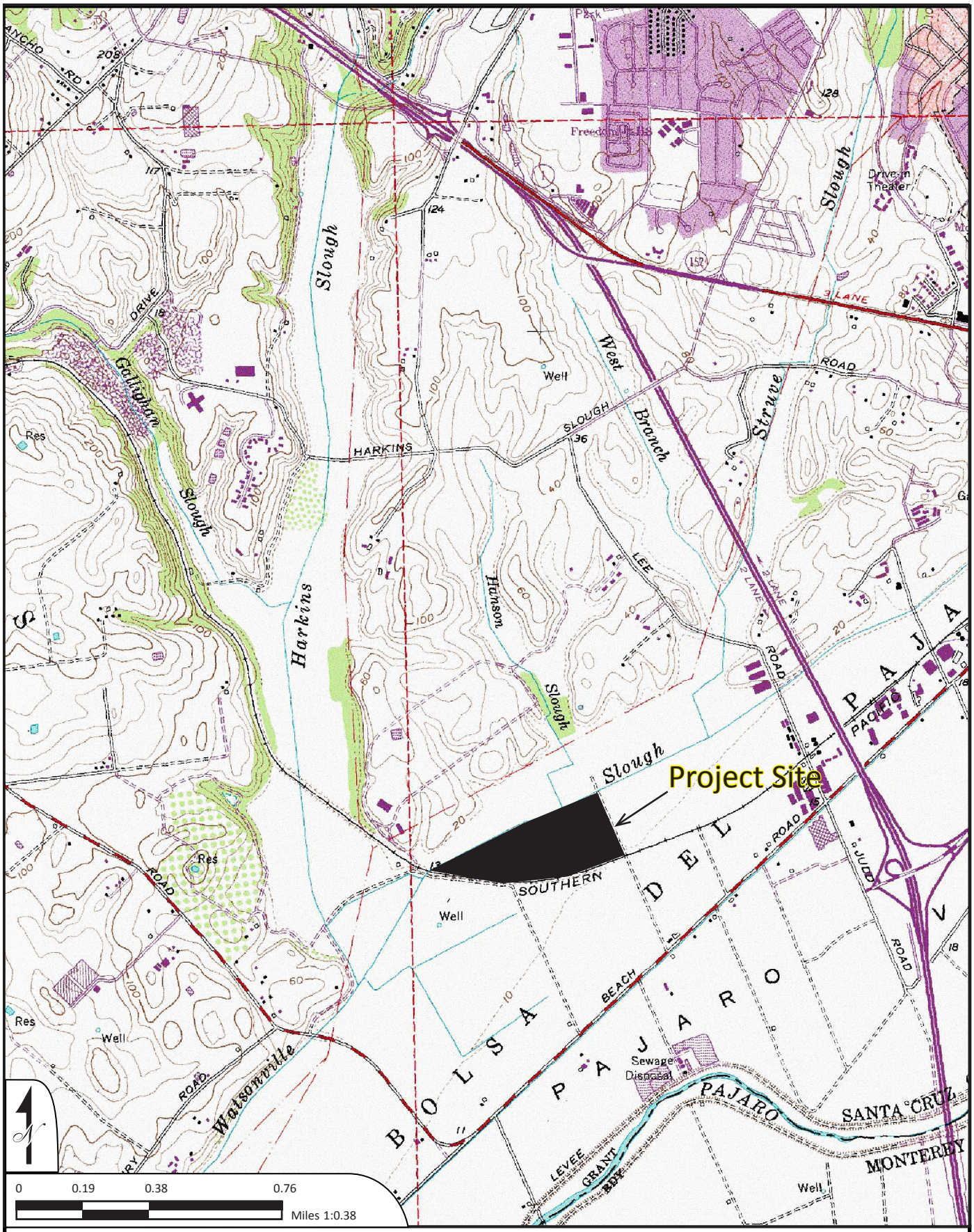
Because of the project site consists of remnant agricultural lands and the project site does not fall within designated critical habitat for Santa Cruz tarplant (critical habitat for this species borders the north boundary of the project site, on the north side of Watsonville Slough), we have determined that this project would not adversely affect the species and have no effect on its critical habitat. This species has not been detected within the site during recent surveys (2015). Biologists expect that the project activities would create more suitable habitat for the Santa Cruz tarplant and that natural seed dispersal may occur at the site in the future.

Table 4 provides a summary of the determination of effects that the project proponents have made for each species and its designated critical habitat.

Table 4. Determination of Effects

Species	Federal Listing Status	Critical Habitat	Determination of Effect for Species and Critical Habitat
California red-legged frog	Threatened	Project is within Critical Habitat Unit SCZ-2	Likely to adversely affect species and likely to adversely affect critical habitat.
Santa Cruz tarplant	Threatened	Project falls outside of Critical Habitat	Not likely to adversely affect species; No effect on critical habitat.

7.0 Figures



Project Location Map

BRYANT-HABERT/WAIT
ECOLOGICAL RESTORATION

JANUARY 30, 2013

WATERWAYS CONSULTING, INC.
Santa Cruz, CA | watways.com | Portland, OR

FIGURE
1.0

Figure 2. Restoration and Enhancement Features
Bryant Habert Property

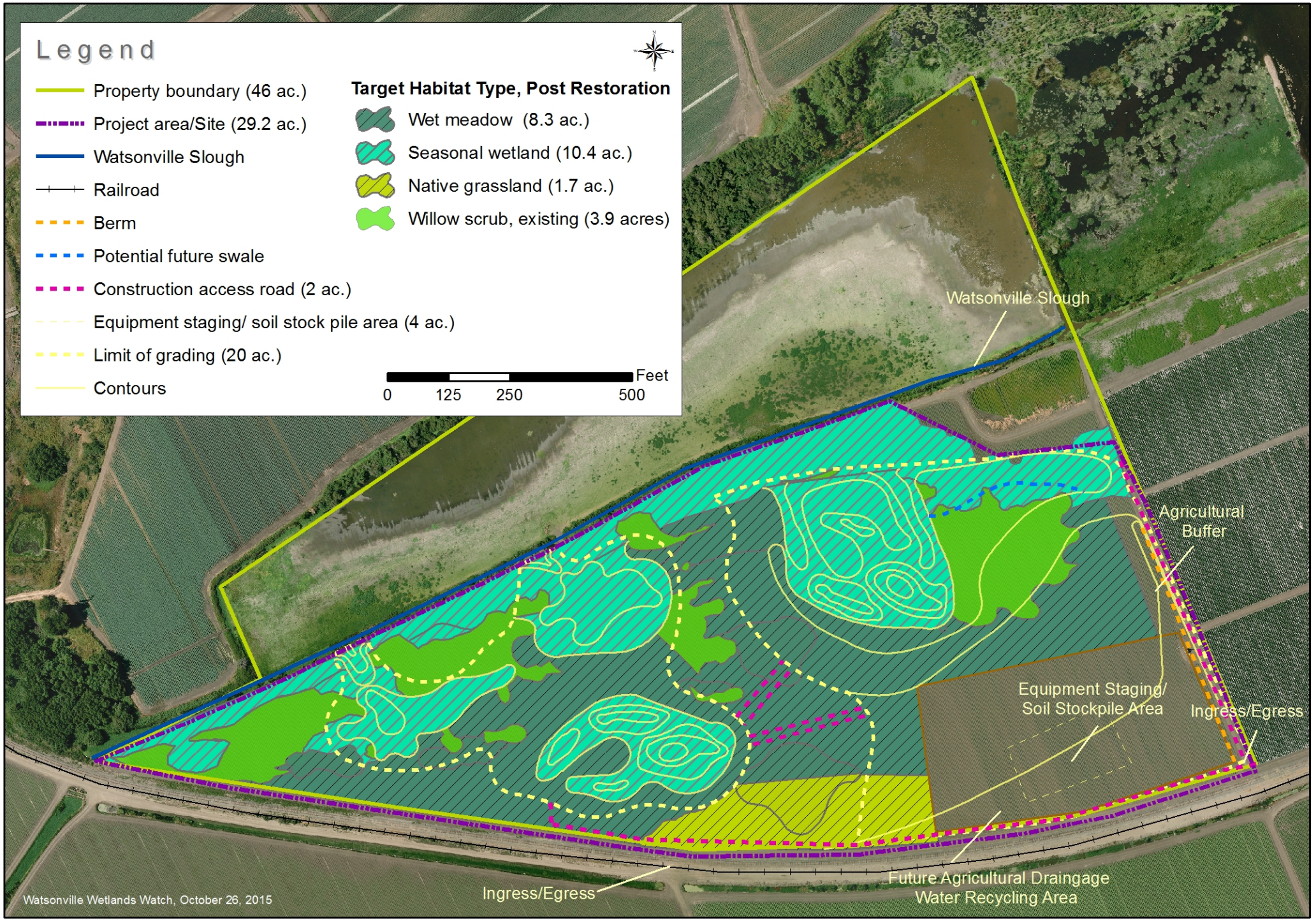


Figure 3. Existing Vegetation
Bryant Habert Property

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Appendix A

Toxicity Categories and LOC (Appendix E, *U.S. Environmental Protection Agency/Environmental Fate and Effects Division Office of Pesticide Programs*)

Appendix E. Toxicity Categories and LOCs

Table 1. Categories of Toxicity for Aquatic Organisms

LC_{50} (ppm)	Toxicity Category
< 0.1	Very highly toxic
> 0.1 - 1	Highly toxic
> 1 - 10	Moderately toxic
> 10 - 100	Slightly toxic
> 100	Practically nontoxic

Table 2. Categories of Toxicity for Terrestrial Organisms

Oral dose LD_{50} (mg/kg-bw)	Toxicity Category
< 10	Very highly toxic
10 - 50	Highly toxic
51 - 500	Moderately toxic
501 - 2000	Slightly toxic
> 2000	Practically nontoxic
Dietary LC_{50} (ppm)	**Toxicity Category**
< 50	Very highly toxic
50 - 500	Highly toxic
501 - 1000	Moderately toxic
1001 - 5000	Slightly toxic
> 5000	Practically nontoxic

Table 3. Categories of Toxicity for Bee

Bee Acute Contact LD_{50} (µg/bee)	Toxicity Category
<2	Highly toxic
2 – 10.99	Moderately toxic
≥ 11	Practically nontoxic

Table 4. Levels of Concern for Terrestrial and Aquatic Organisms

Taxa	Acute LOC	Chronic LOC
Avian[1] (terrestrial phase amphibians)	0.1	1
Mammalian[2]	0.1	1
Terrestrial[3] and Aquatic plants[4]	1	
Aquatic Animals[5] (aquatic phase amphibians)	0.05	1
Insects[6]	0.05	1

Used in RQ calculations:
[1] LD_{50} and estimated NOEL
[2] LD_{50} and NOEC
[3] EC25
[4] EC50
[5] LC/EC_{50} and estimated and reproductive NOEC
[6] LD_{50} per EFED's CRLF Steering Committee

Ecotoxicity Categories for Terrestrial and Aquatic Organisms

Ecotoxicity Categories for Terrestrial and Aquatic Organisms

Toxicity Category	Avian: Acute Oral Concentration (mg/kg-bw)	Avian: Dietary Concentration (mg/kg-diet)	Aquatic Organisms: Acute Concentration (mg/L)	Wild Mammals: Acute Oral Concentration (mg/kg-bw)	Non-Target Insects: Acute Concentration (µg/bee)
very highly toxic	<10	<50	<0.1	<10	
highly toxic	10-50	50-500	0.1 - 1	10 - 50	<2
moderately toxic	51-500	501-1000	>1 - 10	51 - 500	2 - 11
slightly toxic	501-2000	1001-5000	>10 - 100	501 - 2000	
practically nontoxic	>2000	>5000	>100	>2000	>11

Appendix B

Best Management Practices for Herbicide Applications at the Bryant-Habert Ecological Restoration Project

Best Management Practices for Herbicide Applications at the Bryant-Habert Ecological Restoration Project, Santa Cruz, California

The Land Trust will implement the following pesticide use restrictions and best management practices as applicable.

There may be specific exceptions to these required BMPs or additional BMPs for some pesticide active ingredients (AIs) and use patterns; these exceptions and/or additions will be described for each pesticide AI listed in this document.

Herbicides described below are specifically requested by the Land Trust to combat specific weed pests that are expected to occur on the project area. Additionally, specific herbicide formulations are needed to provide adequate information to the consulting agency so that the appropriate effects determinations can be made. No endorsement of named products by Land Trust is intended.

General BMPs for all herbicides unless otherwise stated in the specific chemical description below.

- **Ground-based application only** (e.g., ground-propelled hydraulic sprayers, backpack sprayers, hand sprayers, and wick applicators, etc.).
- Do not exceed **1 application per site per year** unless stated otherwise for individual pesticide AIs.
- **Minimum 25-foot treatment buffer from all surface water resources, unless stated otherwise for individual pesticide AIs or for specific pesticide use patterns.**
- During treatment of grass or herbaceous targets, careful review of the label for herbicide activity on trees or other non-target woody plants should always be considered prior to use under their dripline.
- Do not apply pesticides if significant rainfall is predicted within 24 hours.
- Do not apply pesticides when wind velocity exceeds 7 mph or when inversion conditions exist. Assess wind direction, wind speed, and inversion conditions using measurement devices such anemometers and windsocks.
- Select nozzles and operate application equipment such that spray droplets produced are ASAE droplet spectrum category medium (i.e., Volume Median Diameter = 250-350 microns) or coarser.
- Whenever practical use drift reduction nozzles and strive for boom pressures that produce droplets with median diameters no less than 500 microns (ASAE Droplet Size Category = Very Coarse).
- No spraying when air temperatures exceed 85° F when spray mixes contain 2,4-D or dicamba.
- Do not allow boom height to exceed 20 inches above target canopy.
- Use a marker dye for non-crop spot treatment to indicate treated areas.

- Only use surfactants that are practically non-toxic or slight acute toxicity (LC50 >10 mg/L (ppm)) to aquatic organisms when applying pesticides within 25 feet of surface water resources. Surfactants that fulfill the criteria include: Agri-Dex, LI-700, Hasten Modified Vegetable Oil, Freeway, Dyne-Amic and Kinetic.

Imazapyr

Trade Name(s): Arsenal, Chopper, Ecomazapyr 2 SL, Gullwing, Groundclear, Habitat, Imazapyr 2 SL, Imazapyr 4 SL, Polaris, Polaris AC, Polaris SP, Rotary 2 SL, Stalker, etc.

Ecotoxicity and Environmental Fate:

- Practically non-toxic acute avian, fish, aquatic invertebrate and mammalian toxicity.
- High mobility in alkaline soils; very high water solubility and low affinity for adsorption to soil and organic matter.
- Moderately persistent to persistent in soil. Non-persistent in water.

Approved Use Pattern:

- Maximum rate per application = 1.5 lbs. a.e./acre
- Maximum number of applications per acre per year = 1
- Method(s) of application = Aerial, Ground

Uses:

- May be applied to aquatic (e.g., Habitat) or terrestrial habitats by air or ground for invasive species management as part of a documented IPM program.
- Some trade names not registered for use in California. Consult California Department of Pesticide Regulation website (http://www.cdpr.ca.gov/) for trade name specific information.
- Control of a variety of broadleaf weeds in barley, wheat and fallow.
- Has little or no soil activity therefore delaying application(s) until most target weeds have emerged will improve overall weed control, and improve probability one application will be sufficient.

Aminopyralid

Trade Name(s): Milestone, Milestone VM

Ecotoxicity and Environmental Fate:

- Slight to practically non-toxic acute avian toxicity, practically non-toxic acute fish, aquatic invertebrate and mammalian toxicity, and slight to practically non-toxic acute amphibian toxicity.
- High mobility in soil; very water soluble and low affinity for adsorption to soil and organic matter.

- Non-persistent in water-sunlight, moderate persistence to persistent in soil, and persistent in sediment-water.

Approved Use Pattern:

- Maximum rate per application = 0.11 lb. a.e./acre
- Maximum number of applications per acre per year = 1
- Method(s) of application = Ground only

Uses:

- Effective on several important invasive species, particularly in the Aster family, including knapweeds (diffuse, Russian and spotted), biennial thistles (bull, musk, plumeless and Scotch thistle), Canada thistle and yellow starthistle.
- Broader spectrum of weed control than clopyralid (e.g., Transline).

Glyphosate

Trade Name(s): Marketed under many trade names such as Accord Concentrate Accord SP, Accord XRT, Accord XRT II, Alecto 41S, Aquamaster, AquaNeat, Aqua Star, Buccaneer, Buccaneer Plus, Cornerstone, Cornerstone Plus, Eraser AQ, Extra Credit 5, GlyphoMate 41, Glyphos, Glyphos Aquatic, Glyphosate 4+, Glyphosate 5.4, Glyphosate Pro 4, Glyphos X-TRA, Gly Star Original, Gly Star Pro, Honcho, Honcho Plus, KleenUp Pro, Makaze, Mirage, Mirage Plus, Prosecutor, Ranger Pro, Razor Pro, Remuda, Rodeo, Roundup Original, Roundup OriginalMAX, Roundup PowerMax, Roundup Pro, Roundup Pro Concentrate, Roundup ProMax, Roundup UltraMax, Roundup WeatherMAX, etc.

Ecotoxicity and Environmental Fate:

- Slight acute avian toxicity, slight to practically non-toxic acute fish and aquatic invertebrate toxicity, and practically non-toxic acute mammalian toxicity.
- Low mobility in soil; very soluble in water yet very high affinity for adsorption to soil and organic matter.
- Non-persistent in soil and water.

Approved Use Pattern:

- Maximum rate per application = 1.5 lbs. a.e./acre
- Maximum number of applications per acre per year = 1 application/year
- Aquatic labeled glyphosate (e.g., Aquamaster, AquaNeat, Rodeo, etc.) – no restrictions on ground applications for invasive species control; aerial applications should be restricted to helicopter spot sprays unless total vegetation control is required. An exception is aerial use for treatment of monospecific stands of non-native vegetation or invasive weeds (i.e., non-native Phragmites genotypes) as part of an IPM plan. A nonionic surfactant must be added and be no more than slightly toxic (LC50>10 mg/L) to fish and aquatic invertebrates. Ground applications must occur at sites accessible by watercraft or vehicle unless a large

acreage needs treatment. Applications in fish-bearing water should be avoided during or immediately after prolonged periods of hot weather when dissolved oxygen conditions are marginal. Water body should be treated in portions per label directions.

- Terrestrial labeled surfactant-free glyphosate (e.g., Accord, Roundup Custom, etc.) – no restrictions (i.e., buffer to surface water) on ground applications if used on a terrestrial site dominated by a non-native species, provided the surfactant added is only slightly toxic to trust species present (LC50>10 mg/L) for fish and invertebrates when used near water). Precautions (e.g., spot treatments) should be implemented to avoid damaging desired plant species.
- Terrestrial labeled glyphosate with manufacturer surfactant in formulation (e.g., Roundup Ultramax, Roundup Original, Roundup Original Max, Roundup Weathermax, etc.) applied according to label and maintain 25-foot treatment buffer from surface water resources.

Uses:

- Non-selective broad spectrum weed control in a wide variety of habitats.

Triclopyr

Trade Name(s): Element 3A, Garlon 3A, Grandstand CA, Green Light Cut Vine & Stump Killer, Image, Kraken, Platform, Renovate 3, Tahoe 3A, Turflon Amine, etc.

Ecotoxicity and Environmental Fate:

- Amine formulation has slight acute avian and mammalian toxicity, and practically non-toxic acute fish and aquatic invertebrate toxicity.
- Amine formulation is non-persistent in soil and water.
- Amine formulation readily degrades to the parent acid (triclopyr acid).
- Triclopyr acid is practically non-toxic to slight acute avian toxicity, practically non-toxic acute fish toxicity and slight acute mammalian toxicity.
- Triclopyr acid is mobile in soils; soluble in water and low affinity for adsorption to soil.
- Triclopyr acid moderately persistent in soil and non-persistent in water.
- Tricholoropyridnol (TCP) is a breakdown product of the triclopyr acid, and as such has toxic properties.
- TCP has practically non-toxic acute avian toxicity, slight to moderate acute fish toxicity and slight acute mammalian toxicity.
- TCP is mobile in soils.

Approved Use Pattern:

- Maximum rate per application = 1.25 lbs. a.e./acre
- Maximum number of applications per acre per year = 1
- Method(s) of application = Ground only
- Apply if no significant rainfall is predicted within 72 hours.
- Applicators should be aware of potentially severe eye damage and wear full goggle protection at all times.

Uses:

- May be applied where desirable broadleaves and conifers can be avoided.

Appendix C

The Declining Amphibian Populations Task Force Fieldwork Code of Practice

The Declining Amphibian Populations Task Force Fieldwork Code of Practice

1. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires, and all other surfaces. Rinse cleaned items with sterilized (e.g., boiled or treated) water before leaving each work site.
2. Boots, nets, traps, and other types of equipment used in the aquatic environment should then be scrubbed with 70 percent ethanol solution and rinsed clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond, wetland, or riparian area.
3. In remote locations, clean all equipment with 70 percent ethanol or a bleach solution, and rinse with sterile water upon return to the lab or "base camp" Elsewhere, when washing machine facilities are available, remove nets from poles and wash in a protective mesh laundry bag with bleach on the “delicates” cycle.
4. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolated species, wear disposable gloves and change them between handling each animal. Dedicate sets of nets, boots, traps, and other equipment to each site being visited. Clean them as directed above and store separately at the end of each field day.
5. When amphibians are collected, ensure that animals from different sites are kept separately and take great care to avoid indirect contact (e.g., via handling, reuse of containers) between them or with other captive animals. Isolation from unsterilized plants or soils which have been taken from other sites is also essential. Always use disinfected and disposable husbandry equipment.
6. Examine collected amphibians for the presence of diseases and parasites soon after capture. Prior to their release or the release of any progeny, amphibians should be quarantined for a period and thoroughly screened for the presence of any potential disease agents.
7. Used cleaning materials and fluids should be disposed of safely and, if necessary, taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

The Fieldwork Code of Practice has been produced by the Declining Amphibian Populations Task Force with valuable assistance from Begona Arano, Andrew Cunningham, Tom Langton, Jamie Reaser, and Stan Sessions.

For further information on this Code, or on the Declining Amphibian Populations Task Force, contact John Wilkinson, Biology Department, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.

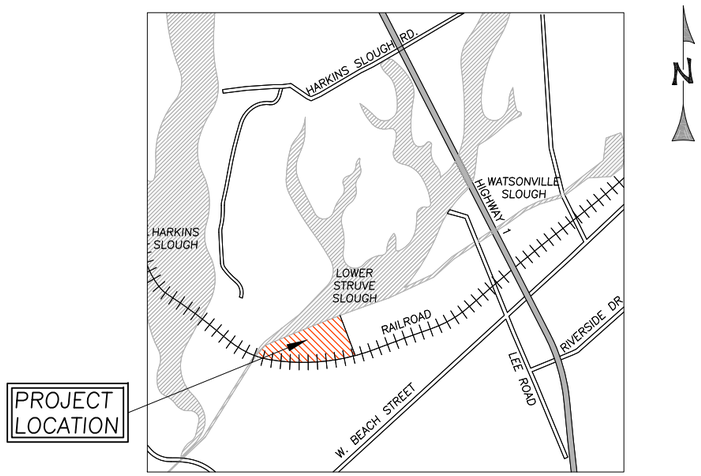
E mail: DAPTF@open.ac.uk
Fax: +44 (0) 1908 654167

Appendix D

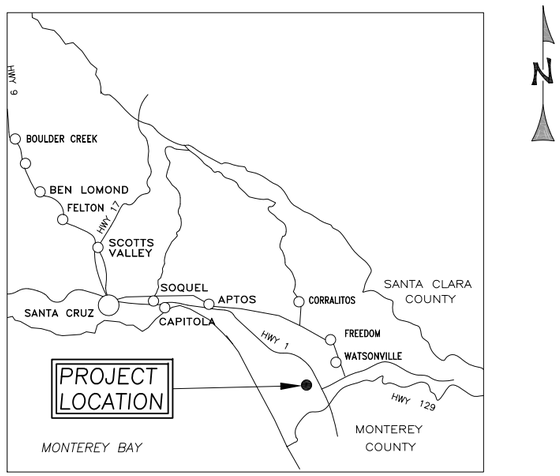
Bryant-Habert / Wait Ecological Restoration Design 100% Design Submittal

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN

100% DESIGN SUBMITTAL



VICINITY MAP
N.T.S.



REGIONAL MAP
N.T.S.

SHEET INDEX

C1	COVER SHEET
C2	SITE GRADING PLAN
C3	ACCESS AND EROSION CONTROL PLAN
C4	TYPICAL SECTIONS
C5	NOTES
C6	EXISTING CONDITIONS
R1	REVEGETATION PLAN

GENERAL NOTES

1. TOPOGRAPHIC MAPPING IS A COMPILATION OF AMBAG LIDAR DATA AND SUPPLEMENTAL CROSS SECTIONS OF THE WATSONVILLE SLOUGH DITCH THAT WERE CONVENTIONALLY SURVEYED BY BALANCE HYDROLOGICS UNDER SEPARATE CONTRACT FOR THE WATSONVILLE SLOUGH HYDROLOGY STUDY.
2. HORIZONTAL DATUM: CALIFORNIA STATE PLANE COORDINATE SYSTEM, ZONE 3, NAD 83
   VERTICAL DATUM: NAVD 88, BASED ON TIES TO NGS BENCHMARK PID GU4161.
3. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEET.
4. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES SHOWN HEREON ARE SCHEMATIC AND SUBJECT TO CHANGE.
5. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE CURRENT EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").

ABBREVIATIONS

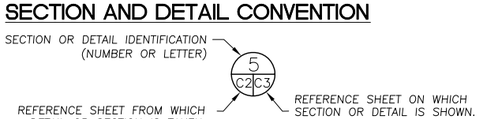
AVG.	AVERAGE
CC	CONCRETE
CY	CUBIC YARDS
DIA.	DIAMETER
E	EXISTING
E.G.	EXISTING GROUND
ELEV.	ELEVATION
DI	DRAINAGE INLET
FG	FINISHED GRADE
FT	FEET
INV	INVERT
N	NEW
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.D.	RELATIVE COMPACTION
RSP	ROCK SLOPE PROTECTION
SPK	SPIKE
SQ.FT.	SQUARE FOOT
T	TREE
T.B.D.	TO BE DETERMINED
TYP	TYPICAL
UNK	UNKNOWN
WSE	WATER SURFACE ELEVATION
YR	YEAR

PROJECT DESCRIPTION

THESE DRAWINGS PROVIDE 100% DESIGN LEVEL DETAILS FOR THE ECOLOGICAL ENHANCEMENTS PROPOSED TO BE IMPLEMENTED OVER APPROXIMATELY 20 ACRES OF PREVIOUSLY FARMED LOW LYING LAND NEAR THE CONFLUENCE OF WATSONVILLE AND STRUVE SLOUGHS, WATSONVILLE, CALIFORNIA.

WORK SHALL CONSIST OF RECONTOURING TO FORM DEPRESSION COMPLEXES AND IMPLEMENTATION OF A NATIVE REVEGETATION PLAN.

SECTION AND DETAIL CONVENTION



REV.	DATE	DESCRIPTION	BY
1	2/13/15	NO REVISIONS THIS SHEET	B.M.S.
2	5/6/15	UPDATED PROJECT DESCRIPTION	B.R.S.

WATERWAYS CONSULTING INC.
WATSONVILLE WETLANDS WATCH
500 HARKINS SLOUGH ROAD
WATSONVILLE, CA 95076

5/6/15 DATE

PROFESSIONAL ENGINEER REGISTERED CIVIL STATE OF CALIFORNIA
MATT W. WELD
No. 62235
Exp. 9-30-15

MATT W. WELD

PREPARED AT THE REQUEST OF:
RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY

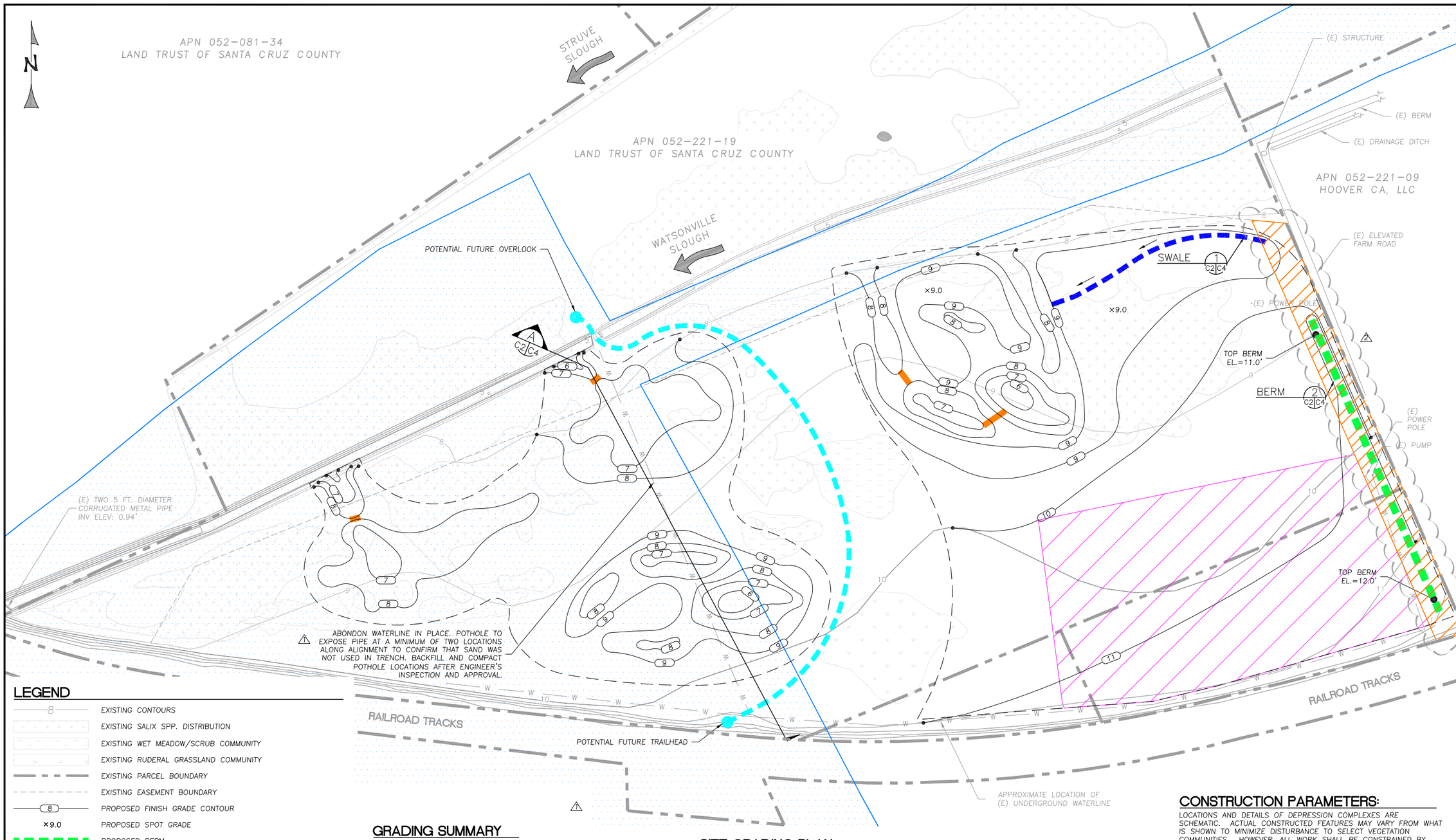
COVER SHEET

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
100% DESIGN SUBMITTAL

DESIGNED BY:	K.L.N.
DRAWN BY:	B.R.S.
CHECKED BY:	M.W.W.
DATE:	2/17/15
JOB NO.:	12-007

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C1



LEGEND

- EXISTING CONTOURS
- EXISTING SALIX SPP. DISTRIBUTION
- EXISTING WET MEADOW/SCRUB COMMUNITY
- EXISTING RUDERAL GRASSLAND COMMUNITY
- EXISTING PARCEL BOUNDARY
- EXISTING EASEMENT BOUNDARY
- PROPOSED FINISH GRADE CONTOUR
- ×9.0 PROPOSED SPOT GRADE
- PROPOSED BERM
- POTENTIAL FUTURE TRAIL/BOARDWALK ALIGNMENT AND OVERLOOK
- POTENTIAL FUTURE EXCAVATION/BREACHING TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
- POTENTIAL SWALE TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
- AREA RESERVED FOR FUTURE DRAINAGE WATER RECYCLING AREA (4 ACRES ±)
- AGRICULTURAL BUFFER (0.9 ACRES ±)
- LIMITS OF GRADING
- DESIGNATED FEMA FLOODWAY (APPROX.)

GRADING SUMMARY

PROJECT TOTAL	
CUT	11,350 CY
FILL	11,350 CY
NET	0 CY
WITHIN FLOODWAY	
CUT	6,850 CY
FILL	0 CY
NET CUT	6,850 CY
OUTSIDE FLOODWAY	
CUT	4,500 CY
FILL	11,350 CY
NET FILL	6,850 CY

NOTE: THE ABOVE QUANTITIES ARE REPRESENTATIVE OF THE MAXIMUM VOLUME OF GRADING TO OCCUR. GRADING QUANTITIES WILL BE BALANCED ON SITE.

SITE GRADING PLAN

SCALE: 1"=80'

NOTES

1. EXISTING CONDITIONS CONTOURS SHOWN HEREON WERE SIMPLIFIED FROM THE AMBAG LIDAR DATA, FOR ILLUSTRATION PURPOSES ONLY. THE EXISTING GROUND SURFACE AND GRADING VOLUMES ARE BASED ON THE ORIGINAL LIDAR DATA NOT ON THE SIMPLIFIED CONTOURS.
2. VERTICAL DATUM IS NAVD 88.

CONSTRUCTION PARAMETERS:

LOCATIONS AND DETAILS OF DEPRESSION COMPLEXES ARE SCHEMATIC. ACTUAL CONSTRUCTED FEATURES MAY VARY FROM WHAT IS SHOWN TO MINIMIZE DISTURBANCE TO SELECT VEGETATION COMMUNITIES. HOWEVER, ALL WORK SHALL BE CONSTRAINED BY THE FOLLOWING CRITERIA:

1. MAXIMUM CONSTRUCTED SLOPE SHOULD NOT EXCEED 10H:1V, EXCEPT AT LOCALIZED SMALL AREAS AS SHOWN HEREON.
2. MINIMUM ELEVATION OF DEPRESSION COMPLEXES IS 6 FEET.
3. MAXIMUM DEPRESSION DEPTH IS 4 FEET BELOW EXISTING GROUND.
4. FILL DEPTH SHOULD NOT EXCEED 18 INCHES, EXCEPT WHERE SHOWN HEREON.
5. LIMITS OF CLEARING AND GRUBBING SHALL BE STAKED IN COORDINATION WITH THE BIOLOGIST PRIOR TO GRADING, BASED ON PLANT SURVEYS TO BE PERFORMED IMMEDIATELY PRIOR TO WORK.

REV.	DATE	DESCRIPTION	BY
1	2/13/15	REVISED GRADING QUANTITIES, ADDED NOTE	B.R.S.
2	5/6/15	ADDED AGRICULTURAL BUFFER	B.R.S.

WATERWAYS CONSULTING INC.

WATSONVILLE WETLANDS WATCH
500 HARKINS SLOUGH ROAD
WATSONVILLE, CA 95076

5/6/15 DATE

REGISTERED PROFESSIONAL ENGINEER * CIVIL * MATT W. WELD * No. 62235 Exp. 9-30-15 * STATE OF CALIFORNIA

MATT W. WELD

PREPARED AT THE REQUEST OF:
RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY

SITE GRADING PLAN

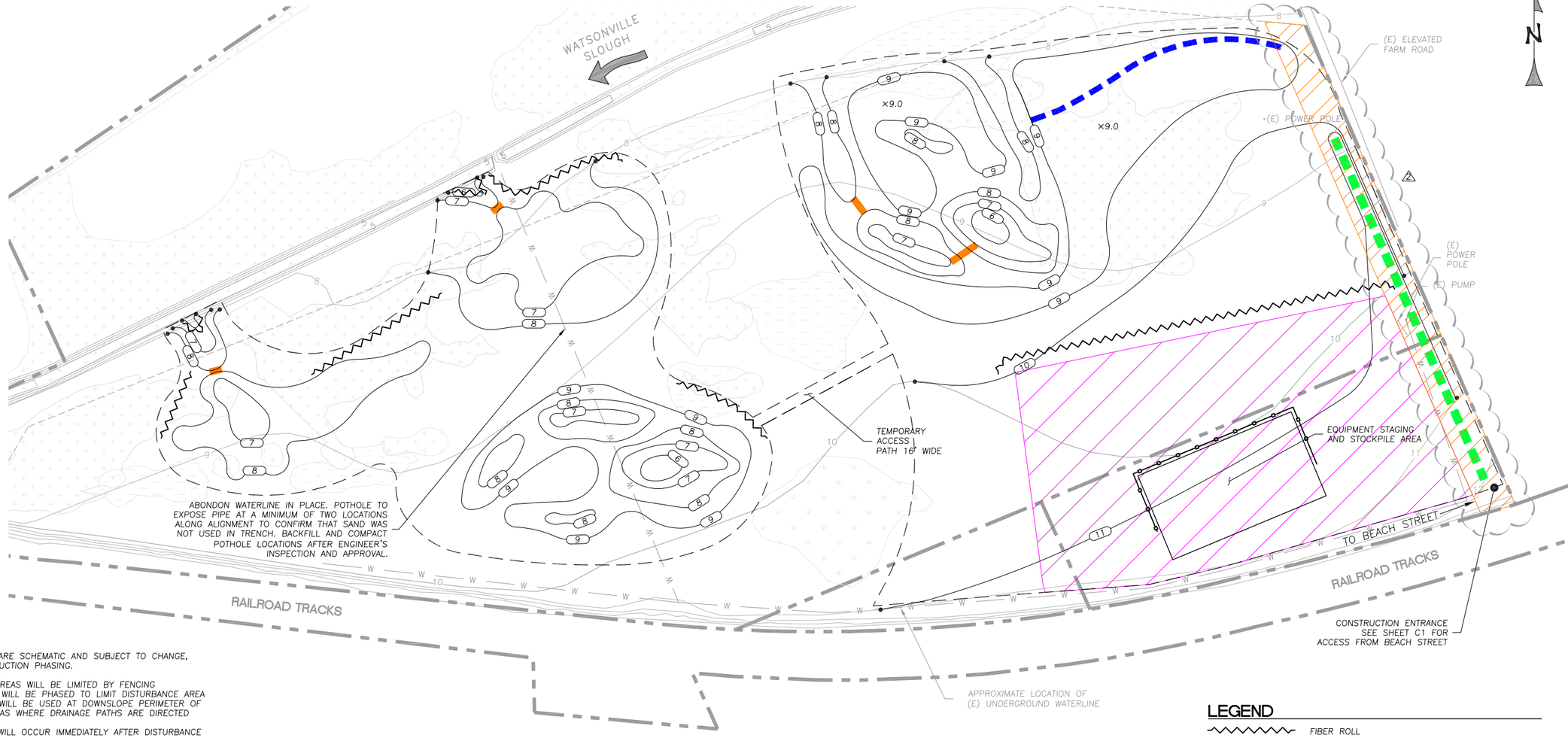
BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
100% DESIGN SUBMITTAL

DESIGNED BY:	K.L.N.
DRAWN BY:	B.R.S.
CHECKED BY:	M.W.W.
DATE:	2/17/15
JOB NO.:	12-007

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C2

2 OF 7



NOTES:

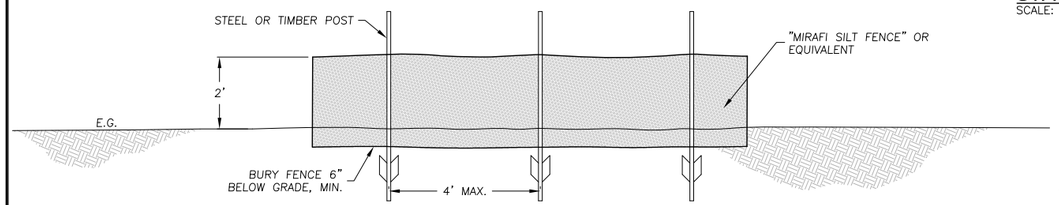
1. FEATURES SHOWN ARE SCHEMATIC AND SUBJECT TO CHANGE, BASED ON CONSTRUCTION PHASING.
2. GENERALLY
   - DISTURBANCE AREAS WILL BE LIMITED BY FENCING
   - CONSTRUCTION WILL BE PHASED TO LIMIT DISTURBANCE AREA
   - SILT CONTROL WILL BE USED AT DOWNSLOPE PERIMETER OF DISTURBED AREAS WHERE DRAINAGE PATHS ARE DIRECTED OFF SITE
   - REVEGETATION WILL OCCUR IMMEDIATELY AFTER DISTURBANCE

STAGING AND EROSION CONTROL PLAN

SCALE: 1"=80'

LEGEND

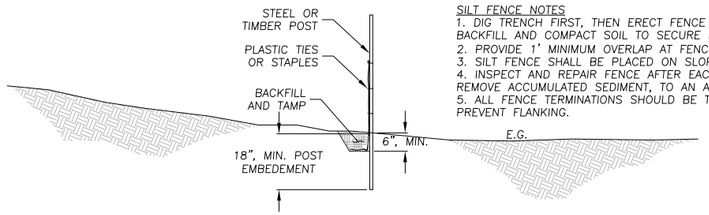
- FIBER ROLL
- SILT FENCE
- LIMITS OF GRADING
- 8 — EXISTING CONTOURS
- EXISTING SALIX SPP. DISTRIBUTION
- EXISTING WET MEADOW/SCRUB COMMUNITY
- EXISTING RUDERAL GRASSLAND COMMUNITY
- EXISTING PARCEL BOUNDARY
- EXISTING EASEMENT BOUNDARY
- 8 — PROPOSED FINISH GRADE CONTOUR
- ×9.0 — PROPOSED SPOT GRADE
- PROPOSED BERM
- POTENTIAL FUTURE EXCAVATION/BREACHING TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
- POTENTIAL SWALE TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
- AREA RESERVED FOR FUTURE DRAINAGE WATER RECYCLING AREA (4 ACRES ±)
- AGRICULTURAL BUFFER (0.9 ACRES ±)



SILT FENCE

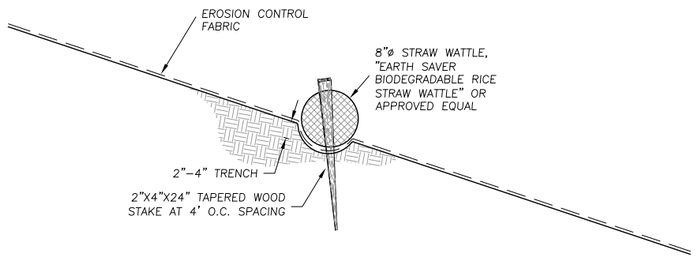
SCALE: 1"=2'

1 C3 C3



SILT FENCE NOTES

1. DIG TRENCH FIRST, THEN ERECT FENCE IN TRENCH. BACKFILL AND COMPACT SOIL TO SECURE FABRIC.
2. PROVIDE 1' MINIMUM OVERLAP AT FENCE SPLICES.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS.
4. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE ACCUMULATED SEDIMENT, TO AN APPROVED AREA.
5. ALL FENCE TERMINATIONS SHOULD BE TURNED UPSLOPE TO PREVENT FLANKING.



FIBER ROLL

SCALE: 1"=1'

2 C3 C3

REV.	DATE	DESCRIPTION	BY
1	2/13/15	NO REVISIONS THIS SHEET	B.M.S.
2	5/6/15	ADDED AGRICULTURAL BUFFER	B.R.S.

WATERWAYS CONSULTING INC.

WATSONVILLE WETLANDS WATCH
500 HARKINS SLOUGH ROAD
WATSONVILLE, CA 95076

5/6/15 DATE

REGISTERED PROFESSIONAL ENGINEER MATT W. WELD No. 62235 Exp. 9-30-15 CIVIL STATE OF CALIFORNIA

MATT W. WELD

PREPARED AT THE REQUEST OF:
RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY

ACCESS AND EROSION CONTROL

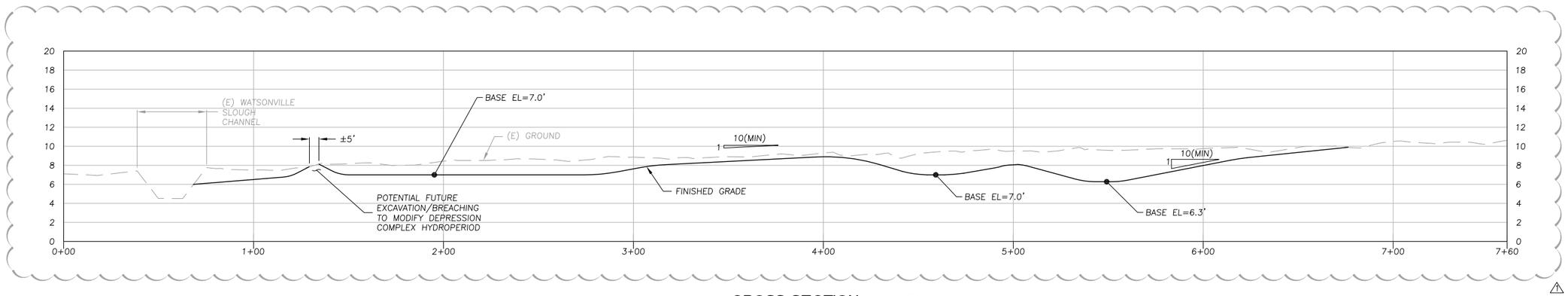
BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
100% DESIGN SUBMITTAL

DESIGNED BY: K.L.N.
DRAWN BY: B.R.S.
CHECKED BY: M.W.W.
DATE: 2/17/15
JOB NO.: 12-007

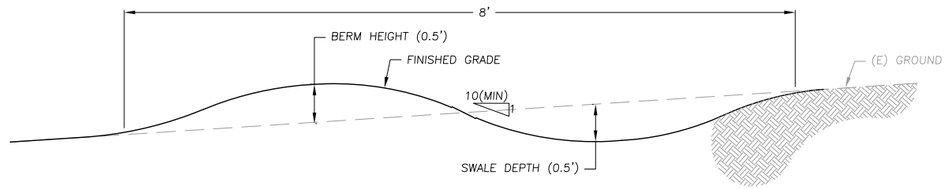
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C3

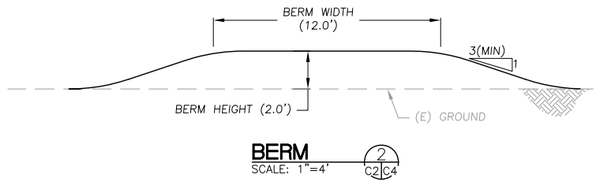
3 OF 7



CROSS SECTION
SCALE: H:1"=30'; V:1"=5'
A C2 C4



SWALE
SCALE: 1"=1'
1 C2 C4



BERM
SCALE: 1"=4'
2 C2 C4

NOTE:
PROVIDE BERM AS A VISUAL BARRIER.
NO ACCESS IMPROVEMENTS PROPOSED.

REV.	DATE	DESCRIPTION	BY
1	2/13/15	ADDED NOTE, REVISED GRADING	B.M.S.
2	5/6/15	NO REVISIONS THIS SHEET	B.R.S.

WATERWAYS CONSULTING INC.
WATSONVILLE WETLANDS WATCH
500 HARKINS SLOUGH ROAD
WATSONVILLE, CA 95076

5/6/15 DATE

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MATT W. WELD

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TYPICAL SECTIONS

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
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BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C4

GENERAL NOTES

1. AFFECTED APN: 052-221-19
2. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE MAY 2006 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
3. THE ENGINEER SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL MONITOR THE WORK, AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.
4. EXISTING UNDERGROUND UTILITY LOCATIONS:
   A. PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.
   B. LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.
   C. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.
   D. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, CONTRACTOR SHALL DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.
   E. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS, AND SHALL BE SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION. CONTRACTOR TO CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.
   F. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.
   G. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.
5. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, HE SHALL NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
6. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.
7. ANY TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION, HOWEVER, OBSERVATION AND TESTING SERVICES ARE REQUIRED BY THE GEOTECHNICAL ENGINEER AS OUTLINED IN THIS PLAN SET AND IN THE GEOTECHNICAL REPORT. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.
8. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL PROVIDE ENGINEER A DETAILED CONSTRUCTION SCHEDULE FOR APPROVAL. THE CONTRACTOR SHALL NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL. THE CONTRACTOR SHALL PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.
11. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.
12. THE CONTRACTOR SHALL MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. ALL MATERIALS SHALL BE STORED WITHIN APPROVED STAGING AREAS.
14. THE CONTRACTOR SHALL PROVIDE, AT HIS EXPENSE, ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION AND CERTIFIED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.
17. CONSTRUCTION WATER IS AVAILABLE THROUGH THE ONSITE WELL. ⚠1
18. WITHIN PROPERTY, ALL EXISTING ROADS WILL BE MAINTAINED IN THEIR CURRENT STATE. NO BASEROCK OR OTHER IMPROVEMENTS ARE TO BE APPLIED TO EXISTING ROADS.

EARTHWORK NOTES

1. ALL CLEARING AND GRUBBING, SUBGRADE PREPARATION AND EARTHWORK SHALL COMPLY WITH THE "BRYANT HABERT PROPERTY VEGETATION MANAGEMENT PLANS", PREPARED BY WATSONVILLE WETLANDS WATCH, AND THE APPLICABLE REQUIREMENTS OF THE SANTA CRUZ COUNTY GRADING ORDINANCE. REFER TO DETAILED SPECIFICATIONS FOR SITE PREPARATIONS CONTAINED IN BRYANT HABERT PROPERTY VEGETATION MANAGEMENT PLANS.
2. GRADING SUMMARY: ⚠1

TOTAL CUT VOLUME =	11,350 CY
TOTAL FILL VOLUME =	11,350 CY
OFFHAUL =	0 CY

   THE ABOVE QUANTITIES ARE APPROXIMATE IN-PLACE VOLUMES CALCULATED AS THE DIFFERENCE BETWEEN EXISTING GROUND AND THE PROPOSED FINISH GRADE, PREPARED FOR PERMITTING PURPOSES ONLY. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS AND/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED. THE QUANTITIES HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING AND GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION, AND RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS AND CONSTRUCTION METHODS.

   THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT AND PLACEMENT OF EARTH MATERIALS OR THE EXPORT AND PROPER DISPOSAL OF EXCESS OR UNSUITABLE EARTH MATERIALS.
3. ALL EXCESS SOILS SHALL BE REMOVED TO AN APPROVED DUMP SITE OR DISPOSED OF ON SITE AT A LOCATION TO BE APPROVED BY THE OWNER, IN A MANNER THAT WILL NOT CAUSE EROSION,
4. FINE GRADING ELEVATIONS AND SLOPES NOT SHOWN SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO OBTAIN DRAINAGE IN THE DIRECTION INDICATED. ALL FINAL GRADING SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
5. ALL CONTACT SURFACES BETWEEN ORIGINAL GROUND AND RECOMPACTED FILL SHALL BE SCARIFIED TO A DEPTH OF AT LEAST 8 INCHES, UNLESS DEEPER EXCAVATION IS REQUIRED BY THE ENGINEER.
6. THE DISTRIBUTION AND GRADATION OF FILL MATERIALS SHALL BE SUCH THAT THERE ARE NO LENSES, POCKETS, STREAKS, OR LAYERS OF MATERIAL.
7. MOISTURE CONTENT OF THE FILL MATERIAL SHALL BE ADEQUATE FOR OBTAINING THE REQUIRED COMPACTION. MATERIAL THAT IS TOO WET SHALL BE DRIED TO MEET THIS REQUIREMENT, OR REMOVED, AND MATERIAL THAT IS TOO DRY SHALL HAVE WATER ADDED AND MIXED UNTIL THE REQUIREMENT IS MET.
8. THE PROPER MOISTURE CONTENT FOR COMPACTION WILL BE DETERMINED BY INSPECTION DURING THE PLACEMENT OPERATION. THE MATERIAL SHOULD MAINTAIN A BALL SHAPE WHEN SQUEEZED IN THE HAND. WHEN SPECIFIED, THE MOISTURE SHALL BE MAINTAINED WITHIN 2 PERCENTAGE POINTS OF OPTIMUM AS DETERMINED BY ASTM D-698.
9. SUPPLEMENTAL WATER, WHEN REQUIRED, MAY BE APPLIED BY SPRINKLING THE MATERIALS ON THE FILL. UNIFORM DISTRIBUTION OF THE MOISTURE SHALL BE OBTAINED BY DISCING, BLADING OR OTHER APPROVED METHOD PRIOR TO COMPACTION.
10. CONSTRUCTION EQUIPMENT SHALL BE OPERATED OVER EACH LAYER OF FILL TO ENSURE THAT THE REQUIRED COMPACTION IS OBTAINED. SPECIAL EQUIPMENT SHALL BE USED IF NEEDED TO OBTAIN THE REQUIRED COMPACTION.
11. FILL SHALL BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY, IN ACCORDANCE WITH ASTM D-1557. THE TOP 8 INCHES OF FILL SHALL BE COMPACTED TO 85% MAXIMUM DENSITY.
12. COMPACTION SHALL MEET THE REQUIREMENTS OF THE METHOD SPECIFIED FOR A, B, OR C, AS DESCRIBED BELOW:
    A. SHEEPSFOOT ROLLER - THE MAXIMUM LAYER THICKNESS SHALL BE 8 INCHES BEFORE COMPACTION. THE ROLLER SHALL HAVE STAGGERED, UNIFORMLY SPACED TAMPING FEET AND BE EQUIPPED WITH SUITABLE CLEANERS. THE WEIGHT OF THE ROLLER SHALL NOT BE LESS THAN 2,500 POUNDS PER FOOT OF WIDTH. THE MAXIMUM SPEED OF THE COMPACTION EQUIPMENT SHALL BE 3 MILES PER HOUR. THE ENTIRE SURFACE OF EACH LAYER PLACED SHOULD RECEIVE 6 PASSES OF THIS EQUIPMENT TO ATTAIN THE NECESSARY COMPACTION.
    B. PNEUMATICALLY TIRED EQUIPMENT - THE MAXIMUM LAYER THICKNESS BEFORE COMPACTION SHALL BE 6 INCHES. A LOADED SCRAPER MAY BE CONSIDERED A PNEUMATIC ROLLER. THE WHEELS OF THIS EQUIPMENT MUST PASS OVER 90 PERCENT OF THE SURFACE OF EACH LIFT BEFORE A NEW LIFT IS PLACED.
    C. TRACK LAYING EQUIPMENT (BULLDOZER) - THE MAXIMUM LAYER THICKNESS BEFORE COMPACTION SHALL BE 4 INCHES. THE TRACKS OF THE EQUIPMENT MUST PASS OVER 90 PERCENT OF THE SURFACE OF EACH LIFT BEFORE A NEW LIFT IS PLACED.
13. HEAVY COMPACTION EQUIPMENT SHALL NOT BE OPERATED WITHIN 2 FEET OF ANY STRUCTURE. HAND DIRECTED TAMPERS OR COMPACTORS SHALL BE USED ON AREAS NOT ACCESSIBLE TO HEAVY COMPACTION EQUIPMENT, AND WITHIN 2 FEET OF ANY STRUCTURE. FILLS COMPACTED IN THIS MANNER SHALL BE PLACED IN LAYERS NOT GREATER THAN 4 INCHES IN THICKNESS BEFORE COMPACTION, AND SHALL MEET THE SAME DENSITY REQUIREMENT AS FOR THE ADJACENT AREA.
14. COMPLIANCE WITH COMPACTION REQUIREMENTS WILL BE DETERMINED BY THE ENGINEER'S OBSERVATION OF PERFORMANCE FOR METHODS A, B, AND C.
15. FILL NOT MEETING THE SPECIFIED REQUIREMENTS SHALL BE REWORKED OR REMOVED AND REPLACED WITH ACCEPTABLE FILL.

ACCESS AND STAGING AREA NOTES

1. PRIOR TO STARTING WORK ON THE PROJECT, THE CONTRACTOR SHALL SUBMIT FOR ACCEPTANCE BY THE ENGINEER A HAZARDOUS MATERIALS CONTROLS AND SPILL PREVENTION PLAN. THE PLAN SHALL INCLUDE PROVISIONS FOR PREVENTING HAZARDOUS MATERIALS FROM CONTAMINATING SOIL OR ENTERING WATER COURSES, AND SHALL ESTABLISH A SPILL PREVENTION AND COUNTERMEASURE PLAN.
2. UTILIZE ONLY THE APPROVED ACCESS POINTS, AS SHOWN ON THE DRAWINGS. MATERIALS SHALL BE STOCKPILED WITHIN AN EXISTING FLAT AND PREVIOUSLY DISTURBED AREA.
3. ACCESS PLAN IS SCHEMATIC. CONTRACTOR SHALL SUBMIT A SITE ACCESS PLAN FOR APPROVAL BY THE ENGINEER.
4. THE DOWNSLOPE PERIMETER OF STAGING OR STOCKPILE AREAS SHALL BE CONTAINED WITH SILT FENCE.
5. ALL EQUIPMENT AND MATERIALS SHALL BE STORED, MAINTAINED AND REFUELED IN A DESIGNATED PORTION OF THE STAGING AREA.

EROSION CONTROL NOTES

1. THE EROSION CONTROL PLAN SHOWN IS INTENDED FOR THE SUMMER CONSTRUCTION SEASON (APRIL 15TH TO OCTOBER 15TH). IF THE DRAINAGE FEATURES SHOWN ON THESE DRAWINGS ARE NOT COMPLETED AND DISTURBED AREAS STABILIZED BY OCTOBER 1ST, CONSULT THE ENGINEER FOR ADDITIONAL RAINY SEASON EROSION CONTROL MEASURES.
2. THE EROSION CONTROL DEVICES ON THIS PLAN ARE A SCHEMATIC REPRESENTATION OF WHAT MAY BE REQUIRED. EROSION CONTROL DEVICES MAY BE RELOCATED, DELETED, OR ADDITIONAL ITEMS MAY BE REQUIRED DEPENDING ON THE ACTUAL SOIL CONDITIONS ENCOUNTERED, AT THE DISCRETION OF THE ENGINEER.
3. ALL WORK SHALL COMPLY WITH AN APPROVED STORM WATER POLLUTION PREVENTION PLAN, TO BE PREPARED AND IMPLEMENTED BY THE CONTRACTOR, IN COMPLIANCE WITH THE REQUIREMENTS OF THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES, WATER QUALITY ORDER NO. 2009-0009-DWQ, GENERAL PERMIT NO. CAS000002, ADOPTED SEPTEMBER 2, 2009, (HEREAFTER CONSTRUCTION GENERAL PERMIT (CGP).
4. CONTRACTOR SHALL NOT BEGIN SITE DISTURBING ACTIVITIES UNTIL THE SWPPP HAS BEEN APPROVED BY THE OWNER, UPLOADED TO SMARTS, AND A WASTE DISCHARGE IDENTIFICATION (WDID) NUMBER RECEIVED.
5. IMPLEMENTATION OF SWPPP MEASURES SHALL BE THE FIRST ORDER OF BUSINESS UPON SITE MOBILIZATION.
6. PRIOR TO COMMENCING WORK, AREAS TO REMAIN UNDISTURBED SHALL BE PROTECTED WITH ESA FENCING, AS SHOWN ON THE DRAWINGS. ADDITIONAL FENCING MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.
7. DO NOT DISTURB AREAS OUTSIDE OF THE DESIGNATED LIMITS OF DISTURBANCE, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. ALL WORK ASSOCIATED WITH RESTORATION AND REVEGETATION OF DISTURBED AREAS OUTSIDE THE DESIGNATED LIMITS OF DISTURBANCE, AS SHOWN ON THE DRAWINGS, SHALL BE BORN SOLELY BY THE CONTRACTOR.
8. BETWEEN OCTOBER 15 AND APRIL 15, EXPOSED SOIL SHALL BE PROTECTED FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, ANY EXPOSED SOIL ON DISTURBED SLOPES SHALL BE PERMANENTLY PROTECTED FROM EROSION.
9. A STANDBY CREW FOR EMERGENCY WORK SHALL BE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 15 THROUGH APRIL 15). NECESSARY MATERIALS SHALL BE AVAILABLE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES.
10. CONSTRUCT TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THIS PLAN AND/OR AS DIRECTED BY THE ENGINEER TO CONTROL DRAINAGE WHICH HAS BEEN AFFECTED BY GRADING AND/OR TRENCHING OPERATIONS.
11. INSTALL ALL PROTECTIVE DEVICES AT THE END OF EACH WORK DAY WHEN THE FIVE-DAY RAIN PROBABILITY EQUALS OR EXCEEDS 50 PERCENT AS DETERMINED FROM THE NATIONAL WEATHER SERVICE FORECAST OFFICE: WWW.SRH.NOAA.GOV.
12. AFTER A RAINSTORM, ALL SILT AND DEBRIS SHALL BE REMOVED FROM CHECK BERMS AND SEDIMENTATION BASIN AND THE BASIN(S) PUMPED DRY.
13. THE CONTRACTOR IS RESPONSIBLE TO KEEP IN FORCE ALL EROSION CONTROL DEVICES AND TO MODIFY THOSE DEVICES AS SITE PROGRESS DICTATES.
14. THE CONTRACTOR SHALL MONITOR THE EROSION CONTROL DEVICES DURING STORMS AND MODIFY THEM IN ORDER TO PREVENT PROGRESS OF ANY ONGOING EROSION.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS AND SIDEWALKS, AT LEAST ONCE EVERY 24 HOURS WHEN OPERATIONS ARE OCCURRING.
16. CONTRACTOR SHALL BE FAMILIAR WITH THE CONDITIONS OF APPROVAL OF ALL REQUIRED PROJECT PERMITS AND SHALL IMPLEMENT ALL REQUIRED BMP'S PRIOR TO COMMENCING GRADING OPERATIONS.

AIR QUALITY NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL, THROUGHOUT THE CONSTRUCTION, IN ACCORDANCE WITH THE CONDITIONS OF THE DUST CONTROL PERMIT.

1. ALL DISTURBED AREAS, INCLUDING UNPAVED ACCESS ROADS OR STORAGE PILES, NOT BEING ACTIVELY UTILIZED FOR CONSTRUCTION PURPOSES, SHALL BE EFFECTIVELY STABILIZED OF DUST EMISSIONS USING WATER, CHEMICAL STABILIZER/SUPPRESSANT, OR VEGETATIVE GROUND COVER.
2. ALL GROUND-DISTURBING ACTIVITIES (E.G., CLEARING, GRUBBING, SCRAPING, AND EXCAVATION) SHALL BE EFFECTIVELY CONTROLLED OF FUGITIVE DUST EMISSIONS UTILIZING APPLICATION OF WATER OR BY PRE-SOAKING.
3. ALL MATERIALS TRANSPORTED OFFSITE SHALL BE COVERED OR EFFECTIVELY WETTED TO LIMIT DUST EMISSIONS.
4. FOLLOWING THE ADDITION OF MATERIALS TO, OR THE REMOVAL OF MATERIALS FROM, THE SURFACES OF OUTDOOR STORAGE PILES, SAID PILES SHALL BE EFFECTIVELY STABILIZED OF FUGITIVE DUST EMISSIONS UTILIZING SUFFICIENT WATER OR CHEMICAL STABILIZER/SUPPRESANT.
5. ONSITE VEHICLE SPEED ON UNPAVED SURFACES SHALL BE LIMITED TO 15 MPH.
6. DISTURBED AREAS SHALL BE REVEGETATED AS QUICKLY AS POSSIBLE.
7. ONSITE TRUCK AND EQUIPMENT ENGINES SHALL BE MAINTAINED IN GOOD RUNNING CONDITION, IN ACCORDANCE WITH MANUFACTURERS' SPECIFICATIONS.

REV.	DATE	DESCRIPTION	BY
⚠1	2/13/15	ADDED NOTE, REVISED GRADING	B.M.S.
⚠2	5/6/15	NO REVISIONS THIS SHEET	B.R.S.

WATERWAYS CONSULTING INC.
WATSONVILLE WETLANDS WATCH
500 HARKINS SLOUGH ROAD
WATSONVILLE, CA 95076

5/6/15 DATE

REGISTERED PROFESSIONAL ENGINEER MATT W. WELD No. 62235 Exp. 9-30-15 CIVIL STATE OF CALIFORNIA

MATT W. WELD

PREPARED AT THE REQUEST OF:
RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY

NOTES

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100% DESIGN SUBMITTAL

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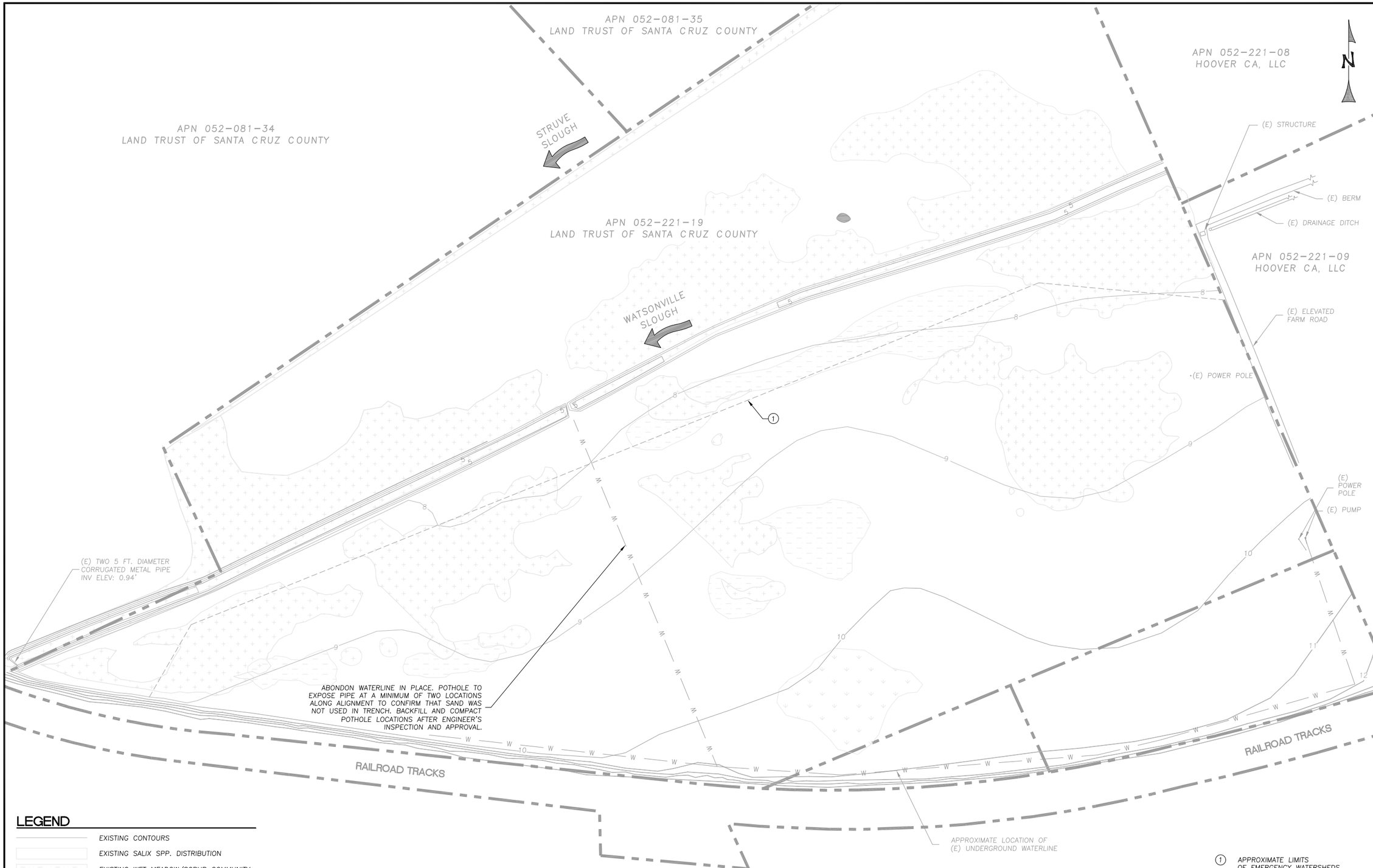


LEGEND

- EXISTING CONTOURS
- EXISTING SALIX SPP. DISTRIBUTION
- EXISTING WET MEADOW/SCRUB COMMUNITY
- EXISTING RUDERAL GRASSLAND COMMUNITY
- EXISTING PARCEL BOUNDARY
- EXISTING EASEMENT BOUNDARY

EXISTING CONDITIONS SITE PLAN

SCALE: 1"=80'

① APPROXIMATE LIMITS OF EMERGENCY WATERSHEDS PROTECTION PROGRAM FLOODPLAIN EASEMENT PER DOC# 2010-0003063

REV.	DATE	DESCRIPTION	BY
1	2/13/15	NO REVISIONS THIS SHEET	B.M.S.
2	5/6/15	NO REVISIONS THIS SHEET	B.R.S.

WATERWAYS CONSULTING INC.
WATSONVILLE WETLANDS WATCH
500 HARKINS SLOUGH ROAD
WATSONVILLE, CA 95076

5/6/15 DATE

REGISTERED PROFESSIONAL ENGINEER MATT W. WELD No. 62235 Exp. 9-30-15 CIVIL STATE OF CALIFORNIA

MATT W. WELD

PREPARED AT THE REQUEST OF:
RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY

EXISTING CONDITIONS

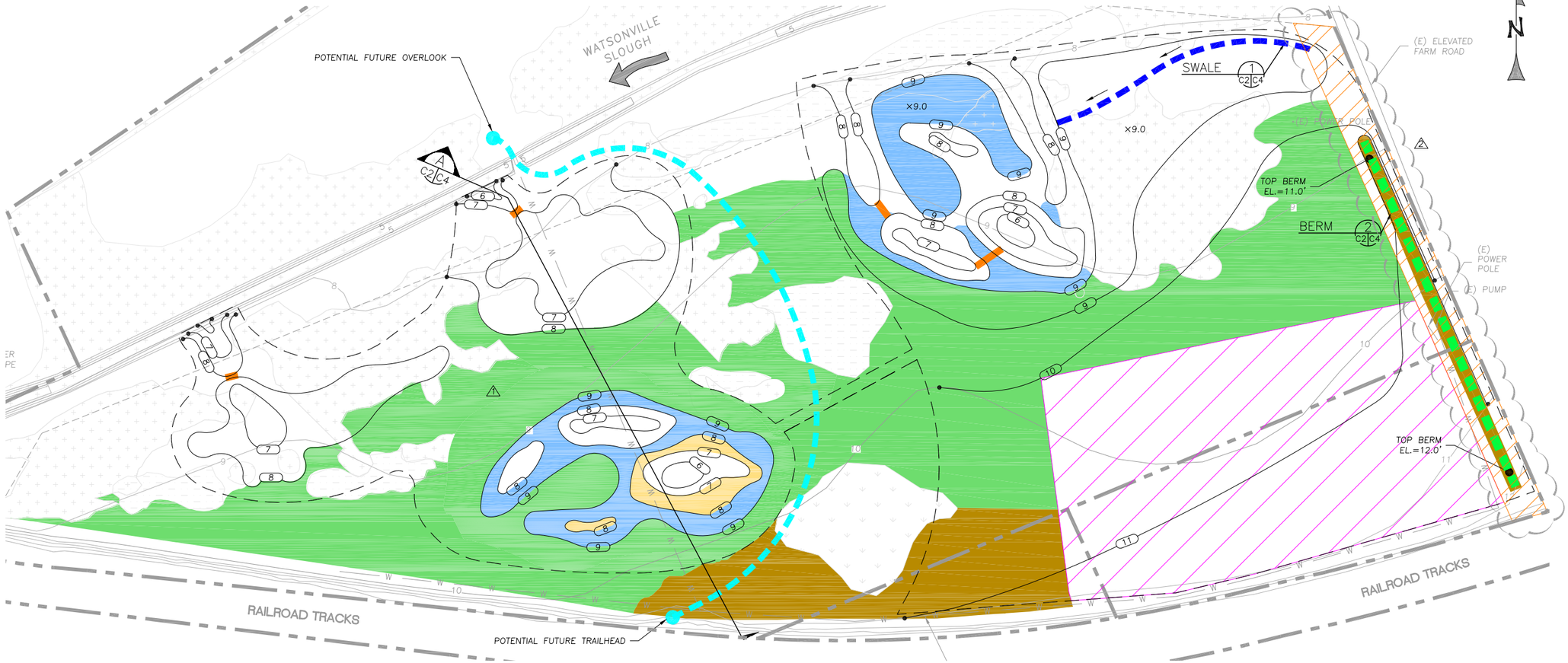
BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
100% DESIGN SUBMITTAL

DESIGNED BY: K.L.N.
DRAWN BY: B.R.S.
CHECKED BY: M.W.W.
DATE: 2/17/15
JOB NO.: 12-007

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C6

6 OF 7



REVEGETATION PLAN
SCALE: 1"=80'

NOTE:
GRADING ACTIVITIES WILL BE FIELD FIT TO AVOID HIGH VALUE EXISTING HABITAT AT TIME OF CONSTRUCTION

PROPOSED PLANT COMMUNITIES

COMMUNITY		AREA	ELEVATION
	PROPOSED SEASONAL WETLAND ENHANCEMENT I	0.2 ACRES	7–8 FT.
	PROPOSED SEASONAL WETLAND ENHANCEMENT II	1.4 ACRES	8–9 FT.
	WET MEADOW ENHANCEMENT	8.2 ACRES	8–11 FT.
	NATIVE GRASSLAND ENHANCEMENT	1.3 ACRES	10–12 FT.

EXISTING PLANT COMMUNITIES

COMMUNITY	
	EXISTING SALIX SPP. DISTRIBUTION
	EXISTING WET MEADOW/SCRUB
	EXISTING RUDERAL GRASSLAND

LEGEND

- 8 — EXISTING CONTOURS
- EXISTING PARCEL BOUNDARY
- EXISTING EASEMENT BOUNDARY
- 8 — PROPOSED FINISH GRADE CONTOUR
- ×9.0 — PROPOSED SPOT GRADE
- PROPOSED BERM
- POTENTIAL FUTURE TRAIL/BOARDWALK ALIGNMENT AND OVERLOOK
- POTENTIAL FUTURE EXCAVATION/BREACHING TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
- POTENTIAL SWALE TO MODIFY DEPRESSION COMPLEX HYDROPERIOD
- AREA RESERVED FOR FUTURE DRAINAGE WATER RECYCLING AREA (4 ACRES ±)
- AGRICULTURAL BUFFER
- LIMITS OF GRADING

REV.	DATE	DESCRIPTION	BY
1	2/13/15	REVISED PLANTING AREAS	B.M.S.
2	5/6/15	ADDED AGRICULTURAL BUFFER, REVISED PLANTING AREAS	B.R.S.

WATERWAYS CONSULTING INC.
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WATSONVILLE, CA 95076

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REVEGETATION PLAN

BRYANT-HABERT/WAIT ECOLOGICAL RESTORATION DESIGN
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R1

7 OF 7