APPS 11710

Appendix D for Williams Brothers

APN 217-255-002

Submitted to:

California Regional Water Quality Control Board -
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

Prepared by:
Natural Resources Management Corporation
1434 3rd Street
Eureka, CA 95501

August 2, 2017

NRM
NATURAL RESOURCES MANAGEMENT
CORPORATION

- Remediation Plan for Discontinued Cult. Sites -

3.2

Site Address and Latitude / Longitude

28829 Alder Point Road, Blocksburg, CA

Latitude: 40.2896 Longitude: -123.647

HUC12: 180101050601 CalWater Planning Watershed: 1111130102

Property Owner & Project Proponent Name, Address, and Contact Information

Dan Williams

28829 Alder Point Road, Blocksburg CA

Phone: 408 590-9193

Licensed professional consultant and contractor Name, Address, and Contact information

Consultant: Natural Resources Management Corporation,

1434 3rd Street, Eureka CA 95501

Contractor: All projects will be completed by a yet to be determined licensed contractor.

Detailed Project Description

Four projects are included: 2 terrace restorations, 1 Ford Crossing restoration, and a historic diversion works restoration (Figure 2). An LSAA Application has been submitted to CDFW. The project work is anticipated to begin and be completed during the summer of 2018. Projects 1 and 2 are the highest priority because they have the highest potential for negative impacts to water quality.

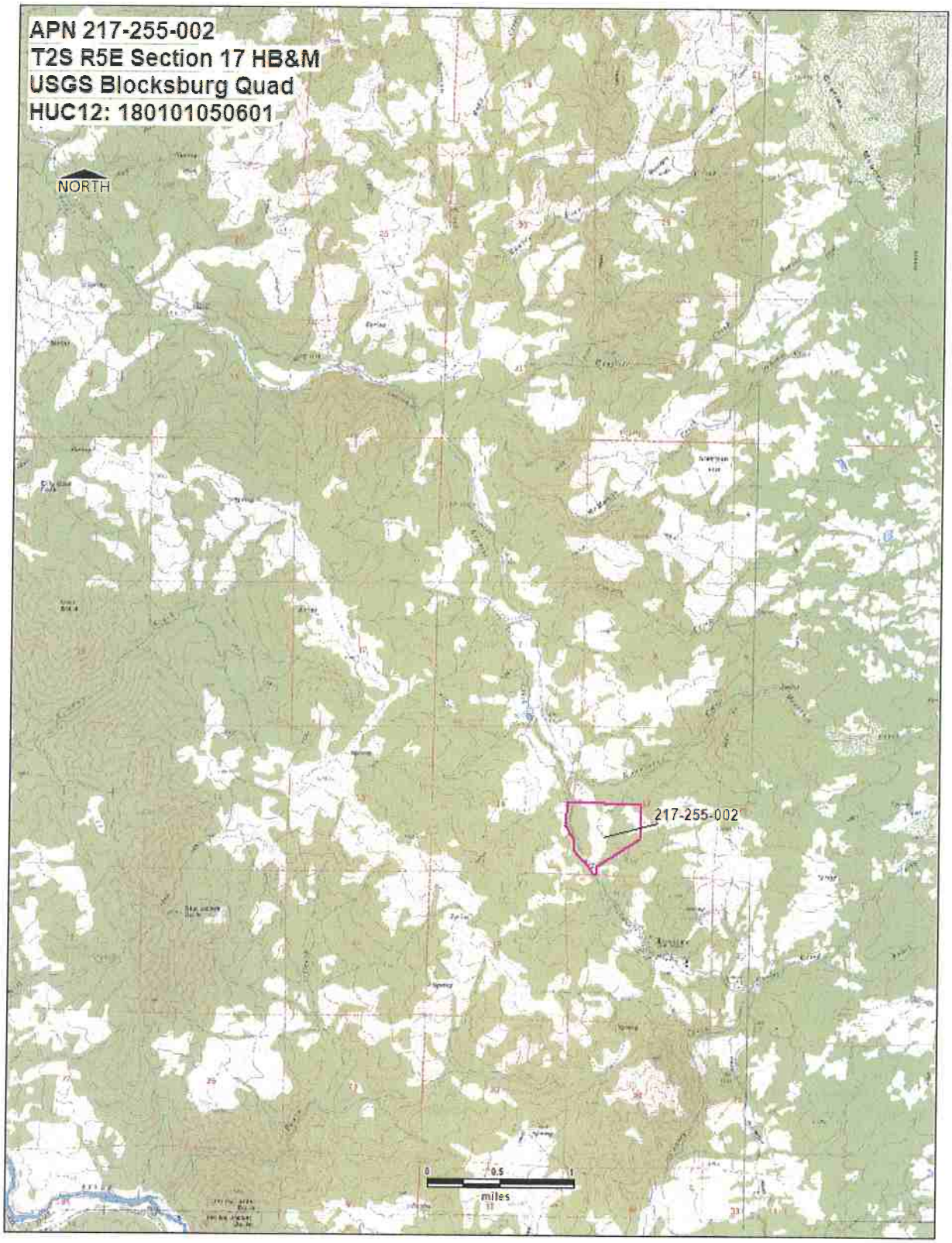


Figure 1. Location map for APN:217-255-002

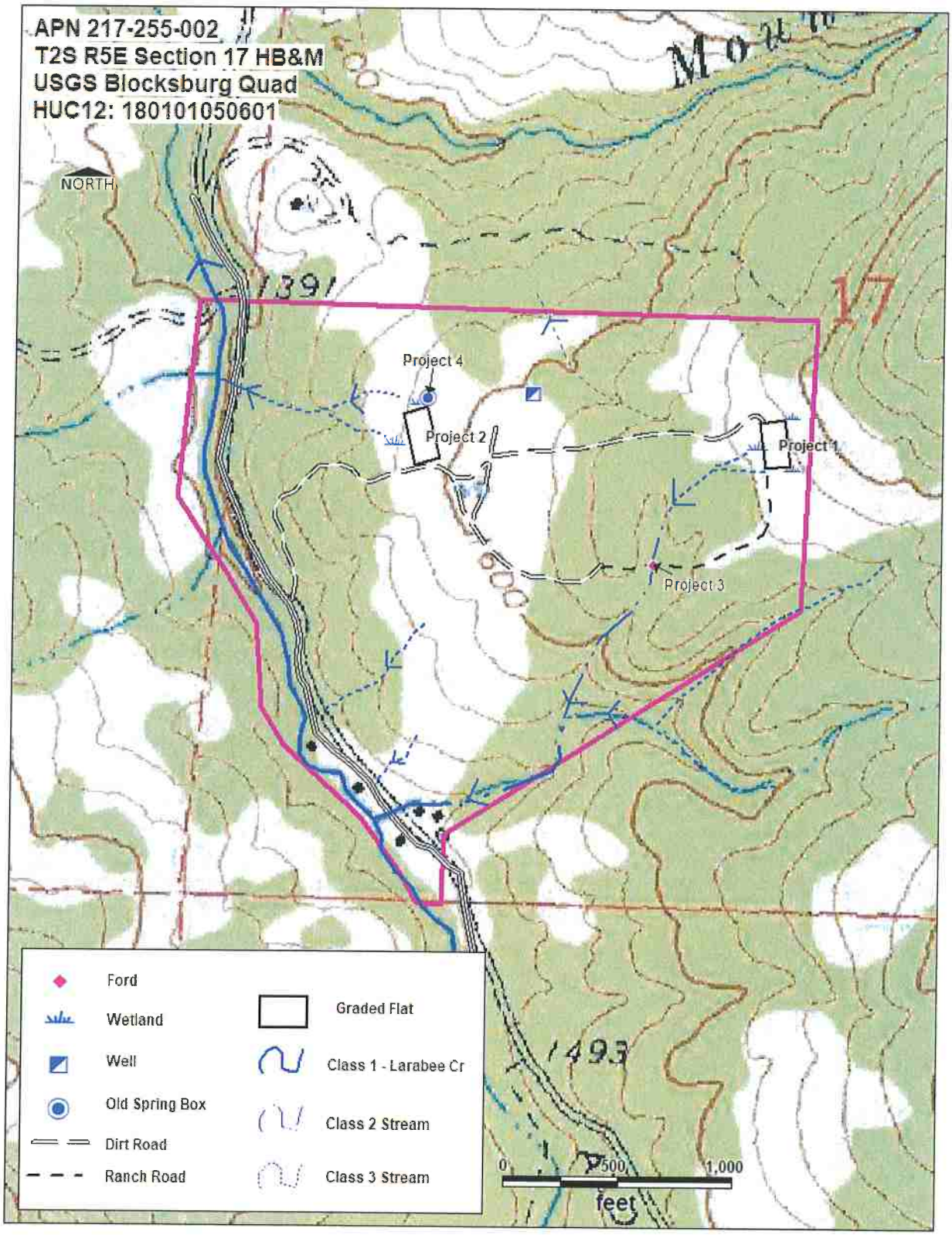


Figure 2. Project Locations for APN: 217-255-002

Project 1

Satellite imagery analysis and site inspection of the Project 1 flat indicate that this terrace has buried a wetland area. The cut bank has daylighted multiple seeps and two discrete points of subsurface flow: one at the northeast corner, and one near the southern extent of the cutbank. These discrete points are both producing flow that is concentrating and connected to a class 3 stream network downslope. The water from the southern spring point is running along the back edge of the terrace, exiting at the southern edge of the terrace, and has cut a path west (downslope) to a saturated area that is connected to a flow course downslope, in the trees. Further downslope, this flow course eventually joins the concentrated flow from the northeast corner. At the northeast corner cutbank-spring point, water is concentrating, flowing across the terrace, and exiting at the scarp of the prominent fill slope failure. This failure and the associated concentrated flow deliver directly to a class 3 stream which is oriented such that it's source may have been near the northeast corner of the cut bank, prior to disturbance of the natural morphology. The fillslope failure deposit has buried a portion of this class 3 stream.

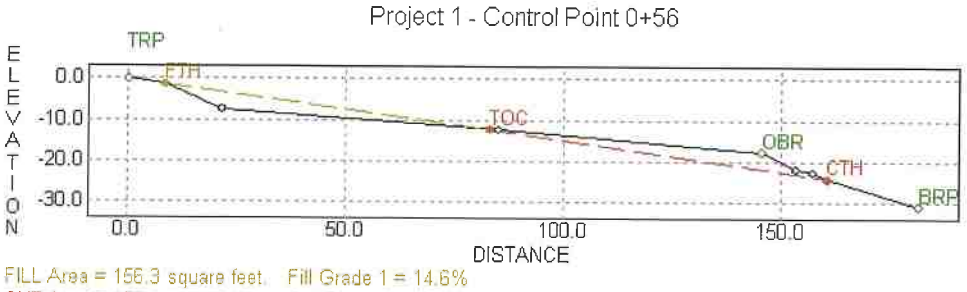
Photo 1. Project 1; Looking at Cutbank. NE corner of terrace is at left edge of photo.

Photo 2. Project 1; NE corner of terrace is at upper left corner of photo, with flow to lower right.

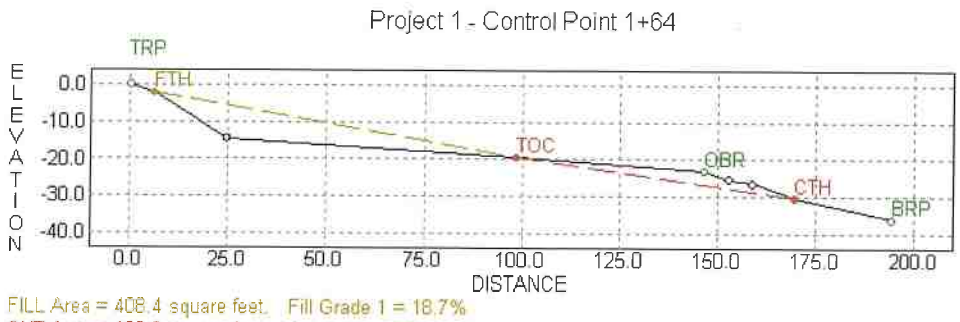
Photo 3. Project 1; Looking South. Flow from NE corner of terrace is in foreground of photo.

Photo 4. Project 1; Looking Downslope at Fill Failure caused by flow from NE corner of terrace.

This project will outslope the terrace by retrieving the sidecast fill, placing it at the cut bank to match the top of the cut, and shaping the fill to mimic the original topography. The Project will disturb an area of approximately 30,000 square feet and excavate approximately 1700 yd^3. The project will not place any excavated fill at the cut bank at the two locations where piping has occurred. Any fill placed in these courses or attempt to bury them will likely result in future water quality issues – potential diversion, sediment delivery, or mudflow. Instead, the flow courses conceived at these two points - established by the creation of the terrace - will be improved to allow free flow from these sources to the natural streams downslope. The gradient of these new channels will closely approximate the natural gradient downslope, relieving the need for grade control. At the cutbank inception points, small boulders will be applied for bank stabilization.

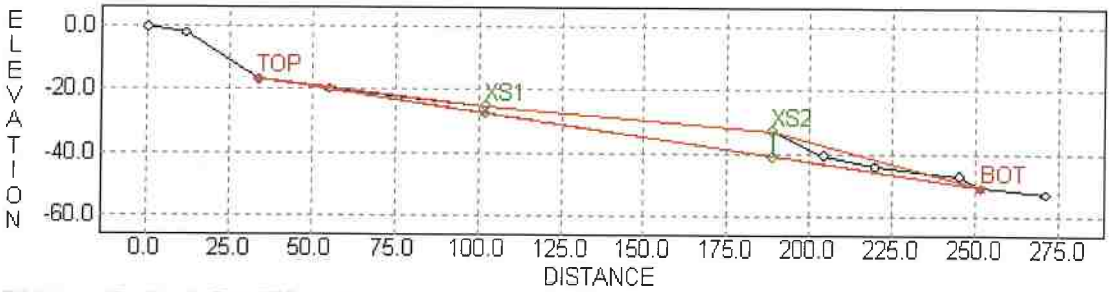


FILL Area = 156.3 square feet. Fill Grade 1 = 14.6%
CUT Area = 158.4 square feet. Cut Grade 1 = 15.4%
TOC-CTH Average Slope = 15.4%
TOC-CP Distance = 0 feet. TOC-CP Average Slope = 0%

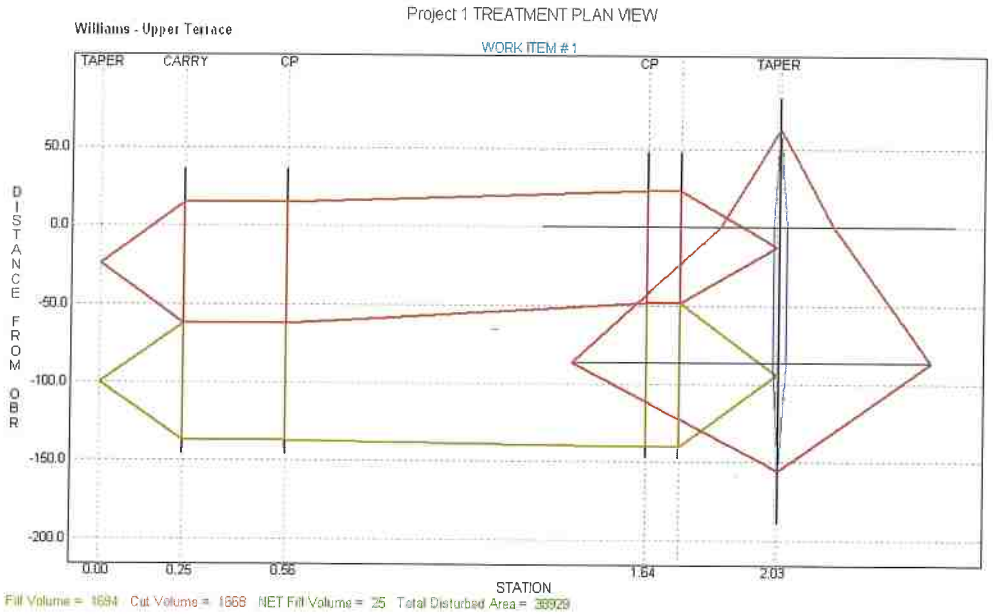


FILL Area = 408.4 square feet. Fill Grade 1 = 18.7%
CUT Area = 136.8 square feet. Cut Grade 1 = 15.4%
TOC-CTH Average Slope = 15.4%
TOC-CP Distance = 0 feet. TOC-CP Average Slope = 0%

Project 1 – Northeast Stream Excavation Profile



TOTAL CUT VOLUME = 728 cubic yards.
Length of Cut = 220.8 feet.
Grade 1 = 15.7%
Depths of Cut (ft.): XS1 = 2.3 XS2 = 8.1



While retrieving the fill, care will be taken to locate and follow the contact between the sidecast fill and the natural ground. This will aid in minimizing the disturbance to original ground and help recover as much sidecast topsoil as possible. A construction monitor will be onsite for all excavations to ensure minimum impacts to natural resources and water quality during implementation of this project.

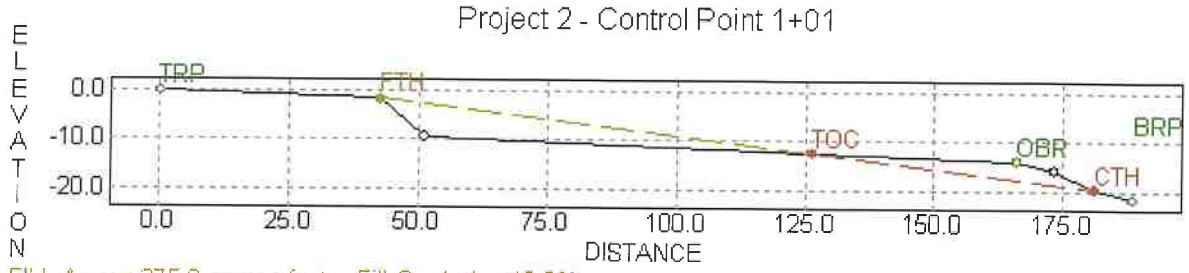
Project 2

Satellite imagery analysis and site inspection of this terrace indicate that it has partially buried one potential wetland feature, and may encroach on a second wetland area. The fill along the western edge of the terrace has covered roughly 20 feet of wetland and there is also a fill failure at this location that deposited on the wetland. This feature is directly connected to a Class 3 stream 75 feet downslope. The fillslope along the western edge of the terrace stops just short of another wetland. This wetland is indirectly connected to a Class 3 stream about 100 feet downslope.

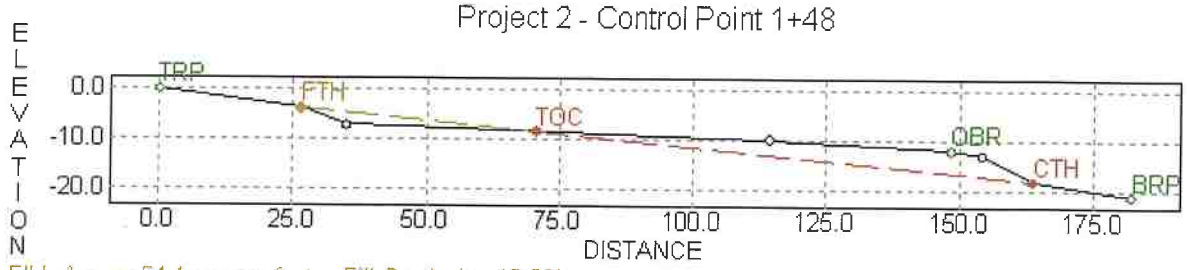
Photo 5. Project 2; Looking South at Fill Slope of terrace. Wetland at lower left of photo.

Photo 6. Project 2; Looking Downslope at Fill Slope/Wetland interface. Connection from terrace to class 3 stream visible in center of photo.

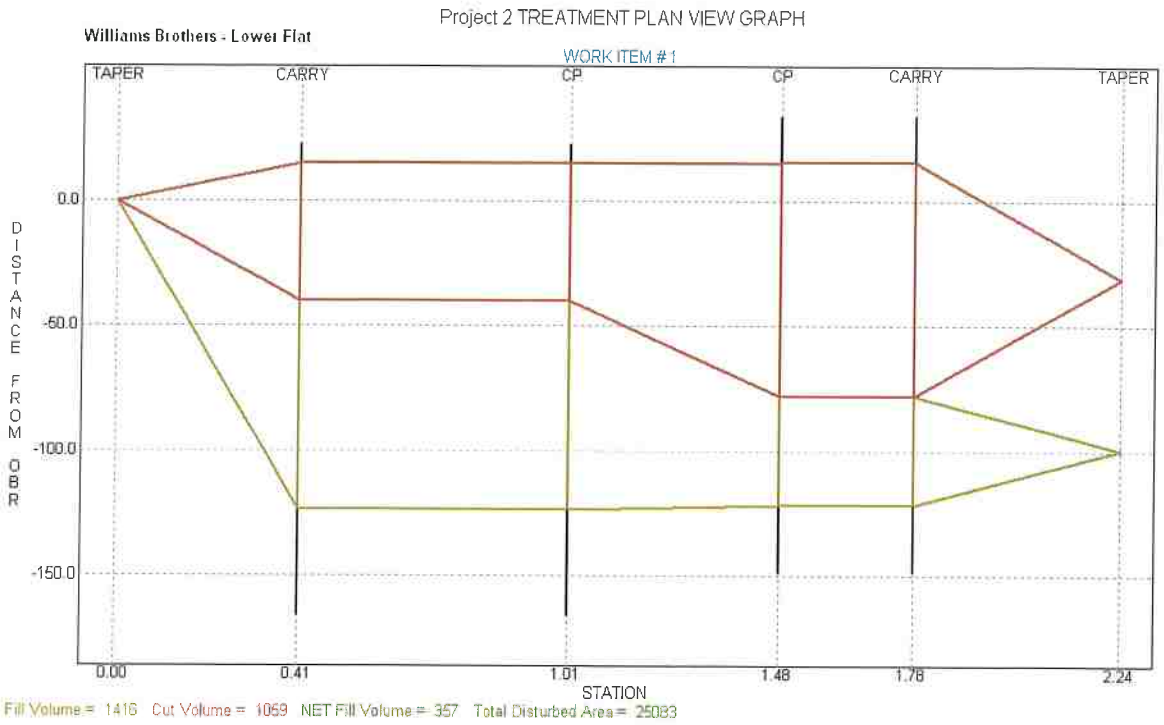
Project 2 will outslope the terrace by retrieving the sidecast fill, placing it at the cut bank to match the top of the cut, and shaping the fill to mimic the original topography. The Project will disturb an area of approximately 25,000 square feet and excavate approximately 1,100 yd^3. While retrieving the fill, care will be taken to locate and follow the contact between the sidecast fill and the natural ground. This will aid in minimizing the disturbance to original ground and help recover as much sidecast topsoil as possible. A construction monitor will be onsite for all excavations to ensure minimum impacts to natural resources and water quality during implementation of this project.



FILL Area = 275.9 square feet. Fill Grade 1 = 12.8%
CUT Area = 109.7 square feet. Cut Grade 1 = 13.3%
TOC-CTH Average Slope = 13.3%
TOC-CP Distance = 0 feet. TOC-CP Average Slope = 0%



FILL Area = 54.1 square feet. Fill Grade 1 = 10.2%
CUT Area = 245.4 square feet. Cut Grade 1 = 10.4%
TOC-CTH Average Slope = 10.4%
TOC-CP Distance = 0 feet. TOC-CP Average Slope = 0%



Project 3

Project 3 is currently a Ford crossing on a class 3 stream. The site is located on a ranch road (road tread on grass with no cut and fill) that runs between Project 1 and the two buildings just west of Project 3. The road has not been used in many years and is blocked by a fallen tree and brush just west of this crossing. The crossing is rocked with nice river cobble, but appears to be undersized to accommodate a Q=100 flow event without diverting and eroding an unknown amount of deliverable sediment. The channel width upstream is about 4'w x 1'd; the ford is about 3 feet wide by 0.5 feet deep. Moreover, there are currently non-functioning water bars on the ranch road that are allowing nearly 600 ft. of road to convey and deliver water to the project site.

For these reasons, the ford crossing will be restored to a 4-foot-wide channel with a bankfull depth of 1.5 feet minimum. The restoration will disturb approximately 25 feet of channel, or 125 ft^2 of areal disturbance. Additionally, waterbars will be improved and/or relocated to disconnect the road input to this stream.

Photo 7. Project 3; Looking Upstream from Downstream of road crossing.

Photo 8. Project 3; Looking Downstream from Upstream of road crossing.

Photo 9. Project 3; Looking Left Bank of road crossing at ranch road input.

Photo 10. Project 3; Looking down road (towards Left Bank of crossing) at failed ranch road waterbar.

Project 4

Project 4 is an unused, historic, spring box. The site works consist of a wooden box and an old section of concrete culvert in a hole surrounded by a spoils berm on the western edge. The treatment here is to remove the works and the berm and allow the spring to connect, at high flow, to a Class 3 stream downslope. Disturbance area will be approximately 200 ft^2.

Photo 11. Project 4; Looking South at Spring Box. North Edge of Project 2 in background.

Project Best Management Practices Projects 1-4

Proposed Schedule

This Project will take between 8 and 11 days to complete. This project will be done during dry periods between May 1 to October 15. If it is necessary to complete the project between October 1 and October 15 the Winter Operating plan below will be followed. See Appendix B of the Order for specific references to BMPs.

Construction BMP's

- **Projects 1 and 2 will require an LTO and construction monitoring due to complexity of the projects.**
- All work will be completed during the summer months when the project area is dry. (BMP II.A.1)
- An excavator and bulldozer will be used to remove, place, and shape the soil and rock.
- Work shall be performed from the top of the creek banks. (BMP II.A.14)
- Equipment will be clean and free of invasive species (BMP II.B.68)
- Equipment will be well maintained and free of oil and fuel leaks. Equipment will not be stored in riparian areas. Drip pans will be placed under parked equipment. (BMP II.A.21
- All removed material will be moved to a stable location with no potential for delivery to the watercourse. (BMP II.A.8)

Erosion Control BMP's

- The entire disturbed area above bank break will be seeded (see planting plans below) and/or covered with weed free straw prior to winter rains. Straw will be anchored with a tackifier (BMP II.A.22)
- Erosion control materials shall be, stored on-site always while work is taking place (BMP II.A.33)
- cleanup/restoration sites shall be stabilized within 7 days of the completion of work. Until stabilization is complete the forecast will be checked daily and A 2-day (48-hour) forecast of rain 50% of greater shall be the trigger immediate completion of stabilization activities. (BMP II.A.37)

Winter Operating Plan (BMP II.A.1)

- No projects will be started after September 30th. October 1st- 15th may be used to finish projects that were started prior to September 30th
- If work will be completed between October 1th and October 15th the rain forecast will be checked prior to starting work. The project will only be started in a four-day window with no forecasted rain. The forecast will be checked daily while work is taking place. A 2-day (48-hour) forecast of rain of 50% or greater shall be the trigger for temporary cessation of project activities and winterization/erosion protection of the work site. Straw with be spread of bare soils and secured to the ground.
- Erosion control works completed up-to-date and daily. Straw wattle will be kept in place and checked daily.
- If an un-forecasted rain event takes place work will immediately cease and erosion control protections will be put into place.

DREDGE AND FILL INFORMATION (The following must be completed for each action where dredging activities, fill material or other activities (e.g. excavation) will result in disturbance and/or discharge to a wetland or other waterbody. Add rows for multiple types of disturbance within the same waterbody type. Attach additional pages as necessary. Provide maps showing the location of project and of all impacts with the corresponding impacts in the format below. Provide all temporary and permanent impacts to waters of the U.S. and waters of the State.)

TYPE OF WATERBODY (i.e. stream, wetland, ephemeral drainage)		FILL and/or EXCAVATION VOLUME AND TYPE (CUBIC YARDS)	FILL and/or EXCAVATION SURFACE AREA (SQUARE FEET OR ACRE)	FILL and/or EXCAVATION LENGTH (LINEAR FEET)	DREDGE VOLUME (CUBIC YARDS)	TYPE OF IMPACT (Temporary or Permanent)
Waters of the U.S						
■ Wetland	1	*1,700*	*30,000 ft²*			Permanent
	2	*1,100*	*25,000 ft²*			Permanent
	4	*10*	*200 ft²*			Permanent
■ Streambed (OHWM and below)	3			*25 ft.*	*6*	Temporary
☐ Lake/Reservoir						
☐ Ocean/Estuary/Bay						
☐ Other						
Sub-total Waters of the U.S.		*2,810*	*55,200 ft²*	*25 ft.*	*6*	
Waters of the State						
☐ Riparian						
☐ Stream channel/bank (Above OHWM)						
☐ Vernal Pool						
☐ Spring/Seep/Headwaters						
☐ Other						
Sub-total Waters of the State						
Total Waters of U.S. and State		*2,810*	*55,200 ft²*	*25 ft.*	*6*	

Project Purpose and Final Goal

The goal of restoring the graded flats (projects 1 and 2) is to reduce the threat to water quality and improve the natural function of the compromised wetlands. The purpose of project 3 is to reduce the risk to water quality by eliminating the potential for the stream to escape its channel and contribute an unknown amount of eroded sediment to the stream at this location. The purpose of Project 4 is to restore the natural function and habitat of the wetland at his location; allowing the spring production to connect with the stream network downslope.

Receiving Waters

Larabee Creek.

Other Relevant Permits

A CDFW 1600 permit application

Project 1: NWP 27 Aquatic Habitat Restoration

Project 2: NWP 27 Aquatic Habitat Restoration

Project 3: NWP 19 Minor Dredging

Project 4: NWP 27 Aquatic Habitat Restoration

Mitigation Proposal

The projects will impact only a minimal amount of existing vegetation, primarily annual grasses. Mitigation measures include: native grass seed and rice straw mulch to be placed on exposed surface soils, hydrologically disconnecting the crossing site, and retention of as much existing riparian vegetation as possible.

Overview and Specifications

Four out of four projects listed above (projects 1-4) will require mitigation efforts in the form of revegetation. A total of 55,325 sq. ft. (1.2701 acres) will be revegetated over the whole site, across all four projects. The following planting plans outline the mitigation and monitoring requirements for each project. Plant species are recommended based on the surrounding habitat, local vegetation, edaphic factors, and climate of the site. Planting densities and seeding rates are based on the professional experience of NRM restoration ecologists and the recommendations of plant and seed providers (Samara Restoration, Pacific Coast Seed etc.). These recommended planting densities and seeding rates are designed to meet desired vegetative cover goals after expected plant mortality. The plant species palate recommended for each project is designed to include flexibility according to plant availability. The maximum species diversity recommended for each project should be utilized when possible. If none of the recommended species are available, a qualified botanist or restoration specialist should be consulted when choosing alternate species.

Revegetation goals include:

- Preventing erosion of disturbed soils
- Replacing destroyed or degraded habitat

Planting specifications

All planting should be done by or under the direction of an experienced restoration contractor.

Seeding

Seeding protocol should conform to the following:

- If possible, the entire area to be seeded should be irrigated prior to the first fall rains. This will promote the germination of weedy grass and forb seeds already present on site. These seedlings can them be easily raked up before the native grass mix is applied, reducing seedling competition (CNGA 2003). This step can greatly contribute to seeding success.
- If soil is compacted by heavy equipment, the entire area will be raked to loosen the top 2-4 inches of soil.
- Seed will be applied at the recommended rate, and evenly spread over the entire area.
- After application the entire area will be gently tamped to promote seed contact with soil.
- After application and tamping, seed will be covered with a 2-inch-thick layer of certified weed-free straw.

Container Planting

All container plants must be planted in the fall or early winter, after the first rains have infiltrated and adequately moistened the soil. Plants used in all projects should have sufficient root mass to fill their container size prior to being transplanted. It is preferred that plant stock be planted as soon as it arrives on site. If necessary, plants may be stored on site for a limited amount of time. If plants are to be stored onsite they will need to be protected from animal herbivory. Since planting will happen well after the first rains, irrigation should not be necessary.

All potted plants used will be healthy and disease free. Plants that are wilted or root-bound will not be used, and will be replaced with healthy stock. Protective plant covers will be placed around each plant and staked into the ground after planting.

Potted plants will be out-planted in the following manner:

- All planting should be evenly distributed throughout the area.
- Plants will be installed on each side of the creek (half on left bank, half on right bank).
- Shrubs will be planted on 5 ft. or 10 ft. centers as specified per project. Ferns, sub-shrubs, and other non-woody plants will be planted on 3 ft. centers.
- Planting techniques should conform to the following:
    - Excavate a hole twice the diameter and one and a half times the depth of the plant's container.
    - Scarify the sides of the hole to loosen the soil.
    - Back-fill the hole with loose soil until it is the same depth as the container.
    - Place plant into the hole and back-fill with soil until it is level with the root ball.
    - Construct a 4-inch-high, 30- inch diameter basin around the plant with the extra soil.
    - Place weed-free mulch or shredder bark 3" deep in a 2-foot radius around the plant.
    - Stake a protective plant cover (large enough to not restrict growth) around the plant.

Monitoring and success criteria

During the first five springs following project completion, a qualified botanist will assess the site for survival of planted shrub species and establishment of native grass species (where applicable). Shrub survival will be assessed using a simple count. Native grass survival will be assessed using meter square plots. 5-10 plots (depending on project size) will be assessed in the following manner:

- Plots will be randomly placed.
- Species identity and absolute cover of all plants will be recorded in each plot.

The re-vegetation will be considered successful if in year 5:

- 70% of cover is native grasses or forbs and no more than 10% cover of listed invasive species (for seeded sites).
- 70% of out-planted shrubs are surviving **OR** surviving shrubs are contributing at least 70% cover.
- Natural native plant recruits may be included towards meeting success criteria.

By December 31st of each year a qualified botanist will submit a written report of the vegetation survey results to the Regional Water Board. If the area does not meet the success criteria above, adaptive management will be utilized and a qualified botanist or restoration ecologist will work with the water board to create a different planting plan for the site.

Planting plans

Project 1:

Overview

Project 1 concerns a terrace restoration back to natural grade, including the restoration of 220 ft. of a Class III channel which was cut through/filled during terrace construction. The project will disturb a total of 30,000 sq. ft. (0.6887 acres). The vegetation on this site was heavily disturbed during the creation of the terrace, but appears in aerial imagery to have been open grassland with patchy wetland features associated with the prior channel. The vegetation currently consists of non-native pasture grasses and forbs. This vegetation will be removed with the use of an excavator as the terrace is re-graded and the channel restored.

Planting Plan

Seeding

Immediately following project completion, and prior to winter rains, the entire 0.6887 acres will be seeded with one of the following native grass mixes from Pacific Coast Seeds:

- Habitat Mix (40 pounds per acre)
- Native Erosion Control Mix (45 pounds per acre).

These mixes are recommended because they include species native to the project area (Humboldt County) and are proven to be effective in the local climate. Species include: *Bromus carinatus* (Native California Brome), *Elymus glaucus* (Blue Wildrye), *Hordeum californicum* (California Barley), *Festuca idahoensis* (Idaho Fescue), *Stipa pulchra* (Purple Needlegrass), and *Poa secunda* (Pine Bluegrass). The disturbance caused by this project provides an opportunity to re-introduce native species back into the local landscape. If these specific mixes are unavailable a qualified botanist will be hired to choose a different native grass seed mix. See above for seeding protocol. This site will require ~ 28 lbs. of seed

Container Planting

After winter rains have adequately moistened the soil, a total of 44 native riparian shrubs will be planted along the reconstructed 220 ft. x 10 ft. Class III channel. Appropriate species to be chosen from area listed below in Table 1. These species are recommended because they are native to the project area, provide soil stabilization, structural diversity, watercourse cover, and enhance the habitat value of the site. For this project, Shrubs should be planted on 10- foot centers, within 5 feet of bank break on both sides of the newly constructed channel.

Table 1. Species appropriate for Project 1.

Common name	**Scientific name**	**Container size (Range)**	**Number recommended**
Oceanspray	*Holodiscus discolor*	D-40 to 1 gallon	8
Blue Elderberry	*Sambucus nigra ssp. cerulea*	D-40 to 1 gallon	12
Red-stem Dogwood	*Cornus sericea*	D-40 to 1 gallon	8
Whitebark Raspberry	*Rubus leucodermis*	D-40 to 1 gallon	8
Oso berry	*Oemlaria cerasiformis*	D-40 to 1 gallon	8

Project 2:

Overview

Project 2 concerns a terrace restoration back to original grade. The project will disturb a total of 25,000 sq. ft. (0.5739 acres) and require revegetation over this entire area. The vegetation on this site was heavily disturbed during the creation of the terrace, but appears in aerial imagery to have been open grassland. The current vegetation being disturbed includes a mix of non-native pasture grasses and forbs. This vegetation will be removed with the use of an excavator when the terrace is re-graded.

Planting Plan

Seeding

Immediately following project completion, and prior to winter rains, the entire area above bank break will be seeded with one of the following native grass mixes from Pacific Coast Seeds:

- Habitat Mix (40 pounds per acre)
- Native Erosion Control Mix (45 pounds per acre).

These mixes are recommended because they include species native to the project area (Humboldt County) and are proven to be effective in the local climate. Species include: *Bromus carinatus* (Native California Brome), *Elymus glaucus* (Blue Wildrye), *Hordeum californicum* (California Barley), *Festuca*

idahoensis (Idaho Fescue), *Stipa pulchra* (Purple Needlegrass), and *Poa secunda* (Pine Bluegrass). The disturbance caused by this project provides an opportunity to re-introduce native species back into the local landscape. If these specific mixes are unavailable a qualified botanist will be hired to choose a different native grass seed mix. See above for seeding protocol. This site will require ~ 24 lbs. of seed.

Project 3:

Overview

Project 3 concerns the restoration of approximate original bed and bank morphology to a ford crossing over a Class III watercourse. The project will disturb a total of 125 sq. ft. (0.0029 acres) which must be revegetated. The total length of the channel area to be disturbed is 25 ft. The vegetation being disturbed includes Douglas-fir forest understory species such as Sword fern and California blackberry, Invasive Himalayan Blackberry, as well as rushes (*Juncus sp.*) growing in the small opening of the ford crossing. This vegetation will be removed with the use of an excavator to allow the channel to be appropriately graded.

Planting Plan

Seeding

Seeding grasses is not recommended for this project, as it is under Doug-fir forest canopy. Planting perennial understory shrubs, subshrubs and ferns is recommended instead. However, a 1-2-inch-thick layer of certified weed free straw should still be applied to the entire area after project completion and prior to the first rains.

Container Planting

After winter rains have adequately moistened the soil, a total of 10 native shrubs and 12 native fern/subshrub species will be planted. Appropriate species are listed below in Table 3. These species are recommended because they are native to the project area, provide structural diversity, soil stabilization, watercourse cover, and enhance the habitat value of the site. See planting protocol above. For this Project, Shrubs should be planted on 5 ft. centers, and ferns and sub-shrubs on 3 ft. centers.

Special Note:

This project site may have burned during the 2017 fire season. If the canopy cover and environmental conditions have been drastically altered by fire, a qualified botanist should be consulted as to whether this planting plan is still appropriate to the site.

Table 3. Species appropriate for Project 4.

Common name	Scientific name	Container size (Range)	Number recommended
Oceanspray (Shrub)	*Holodiscus discolor*	D-40 to 1 gallon	3 (out of 10)
Red-flowering current (Shrub)	*Ribes sanguinium var. glutinosum*	D-40 to 1 gallon	3 (out of 10)
Wood rose (Shrub)	*Rosa gymnocarpa*	D-40 to 1 gallon	4 (out of 10)

Sword Fern (Fern)	*Polystichum munitum*	D-40 to 1 gallon	4 (out of 12)
Lady Fern (Fern)	*Athyrium felix-femina*	D-40 to 1 gallon	4 (out of 12)
California Blackberry (Subshrub)	*Rubus ursinus*	D-40 to 1 gallon	4 (out of 12)

Project 4:

Overview

Project 4 concerns the removal of the works and berm associated with a historic spring box. The project will disturb a total of 200 sq. ft. (0.0046 acres) which must be revegetated. The total length of this circular area is 100 ft. The vegetation being disturbed includes non-native pasture grasses, Himalayan blackberry, and various rushes (*Juncus sp.*) This vegetation will be removed with the use of an excavator to allow the natural topography to be restored.

Planting Plan

Seeding

Immediately following project completion, and prior to winter rains, the entire area above bank break will be seeded with one of the following native grass mixes from Pacific Coast Seeds:

- Habitat Mix (40 pounds per acre)
- Native Erosion Control Mix (45 pounds per acre).

These mixes are recommended because they include species native to the project area (Humboldt County) and are proven to be effective in the local climate. Species include: *Bromus carinatus* (Native California Brome), *Elymus glaucus* (Blue Wildrye), *Hordeum californicum* (California Barley), *Festuca idahoensis* (Idaho Fescue), *Stipa pulchra* (Purple Needlegrass), and *Poa secunda* (Pine Bluegrass). The disturbance caused by this project provides an opportunity to re-introduce native species back into the local landscape. If these specific mixes are unavailable a qualified botanist will be hired to choose a different native grass seed mix. See above for seeding protocol. This site will require ~ 0.19 lbs. of seed.

Container Planting

Planting of container plants will not be necessary for this project.

References

2003. Grasslands. California Native Grass Association (CNGA). 13(3):1, 9-11.