
2013 Off-Site Mitigation Monitoring Report



**FOR THE
CHINA SLIDE CURVE IMPROVEMENT PROJECT
TRINITY COUNTY, STATE ROUTE 299 PM 13.3 – 13.8
EA 02-3C0800**



**WDID No. 1A08121WNTR
USACE File # 2008-00298N**

December 17, 2013



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China Slide Off-Site Mitigation at Hamilton Ranch 2013 Monitoring Report

I. Project Overview

1. USACE File No. 2008-00298N and WDID No. 1A08121WNTR

2. Parties responsible for monitoring:

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and

Trinity County Resource Conservation District
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Monitoring Dates: September 30, 2013 - October 1, 2013

3. Purpose: The California Department of Transportation (Caltrans), District 2, is engaged in a project titled the China Slide Curve Improvement Project to increase the safety of a segment of road on State Route (SR) 299 between post miles (PM) 13.3-13.8. This project permanently impacted 1990 sq. ft. of seep wetlands that flow along the current road alignment from an intermittent stream located at PM 13.42. Road improvements at this location also permanently impacted 171 sq. ft. of riparian vegetation.

To compensate for the 1990 sq. ft. permanently impacted wetlands and 171 sq. ft. of impacted riparian vegetation, wetland enhancements, including weed control and revegetation, must be successful in areas totaling at least 3980 square feet (0.09 acre). In addition at least 342 square feet of riparian habitat creation is required by the 401 Permit. The wetland restoration requirement derives from both the 401 and 404 Permits. To meet these Permit obligations, Caltrans and the Trinity County Resource Conservation District (TCRCD) began enhancing riparian and wetland vegetation within an existing degraded wetland on Hamilton Ranch in 2010.

4. Location: The mitigation project is located within Hamilton Ranch off of Lewiston Road in Lewiston, California. Hamilton Ranch is a 90 acre ranch owned and managed by the Northern District of the California Department of Water Resources (DWR) (Figure 1). The center of the project site is located at 40.690366, -122.856817 decimal degrees. A foot path for hiking is just south of the project site and an old ditch lined with willows makes up the eastern border (Figure 2).

5. Dates mitigation project commenced: March 1, 2010. The initial planting was completed on March 3, 2010. The herbaceous component consisted of 6 species (492 container stock). The riparian component consisted of planting 8 black cottonwood (*Populus balsamifera*) and 12 red willow (*Salix laevigata*).

Subsequent plantings have occurred on November 8-9 and December 13, 2010. This planting included planting of two new herbaceous species, *Equisetum arvense* (200 plugs) and *Elyocharis palustris* (100 plugs) and adding 200 more container stock of *Juncus effusus* to the spring, 2010 planting sites.

On January 4, 2011, additional riparian tree & shrub planting occurred (15 *Populus balsamifera* and 5 *Salix laevigata*).

6. Monitoring results after the first growing season did not meet the annual performance standard of “35% of species showing a positive growth trend”. None of the 20 riparian trees planted in March, 2010 appeared to be alive in fall of 2010. These results were reported in the 2010 monitoring report.

7. In 2013, results from the 2010 data and subsequent site visits were used to define two thriving 2010 planting areas and select additional planting areas that should be successful. Riparian plantings from 2010 and 2011 were reassessed (all riparian plantings have labels) and a surprising number were found surviving. In October, 2013 seven species of invasive non-native plants including sweetbriar (*Rosa rubiginosa*), Himalayan blackberry (*Rubus armeniacus*), cutleaf blackberry (*Rubus laciniatus*), spearmint (*Mentha spicata* var *spicata*), poison hemlock (*Conium maculatum*), St. John’s wort (*Hypericum perforatum*) and bull thistle (*Cirsium vulgare*) were physically removed. On October 22, 2013 the species and quantities listed in Table 3 were planted in the formerly weed infested areas. No additional plantings are anticipated at this time.

8. Maintenance resources such as watering, weed control (without herbicides), and protections from herbivores will be employed in the planting areas to ensure success by 2015.

II. Requirements

Table 1. Performance Standards

Permits:	401	404
Wetland	Restore and revegetate 3980 square feet of wetland (2:1 replacement ratio)	Implement off-site mitigation in accordance with MMP at Hamilton Ranch in cooperation with TCRCD. MMP states 3980 square feet will be planted.
Riparian	Create 342 square feet of riparian habitat. (2:1 replacement ratio)	MMP states 342 square feet of riparian will be created.
Success Criteria	No mention. Board usually follows USACE on criteria.	MMP states 65% of planted species must be alive by 2015. In 2010 and 2013, a minimum of 35% of planted species will show a positive growth trend.
Monitoring	ditto	MMP: 1) Identify existing plant species in mitigation project area. 2) Photo-monitor during the growing season. 3) Assess survival of trees during the growing season.
Reporting	Annual reports by December 31 until completion of project.	Annual reports by Jan 31 through 2015. However, e-mail dated 10/17/08 from D. Ammerman agreed to change reporting to 2010, 2013, and 2015.

Success of the planting areas will be monitored annually in 2014 and 2015.

Table 2. Compensatory Mitigation Area

Areas	SQFT
2010 Successful Plantings	1453
2013 Restoration Area	3517
Current Mitigation Area	4970

In accordance with the MMP, a plant species list was developed for the Hamilton Ranch wetland area that encompasses the project area (Appendix A). The list includes results of surveys performed for DWR and the Trinity River Restoration Program (TRRP) respectively by Lacey and Janeway, 1987 & Boggs and Kirk, 2007. Additional species identified and confirmed since 2010 are attributed by date and source in the spreadsheet format.

A section of the adjacent wetland area was singled out as a high diversity area by DWR botanists in 2003. It could be used qualitatively as a reference wetland (Figure 4).

III. Summary Data

New plantings were installed in October, 2013 to bring the mitigation project up to a successful level (Figure 3). As an essential part of the restoration, invasive non-native plants were cleared from 3,517 sq. ft. of area (Table 1). The invasive species include sweetbriar (*Rosa rubiginosa*), Himalayan blackberry (*Rubus armeniacus*), cutleaf blackberry (*Rubus laciniatus*), spearmint (*Mentha spicata* var *spicata*), poison hemlock (*Conium maculatum*), St. John’s wort (*Hypericum perforatum*) and bull thistle (*Cirsium vulgare*).

2013 restoration areas were planted with 9 native wetland species totaling 260 plants (Table 2). All plant species chosen are native to the local watershed and appropriate to local wetland habitats.

Table 3. Species Planted 10/22/2013

Common Name	Scientific Name	Quantity
Santa Barbara sedge	Carex barbarae	67
creeping wild rye	Elymus triticoides	99
Oregon ash	Fraxinus latifolia	06
common rush	Juncus effusus	15
grey rush	Juncus patens	15
Fremont cottonwood	Populus fremontii	01
red willow	Salix laevigata	08
arroyo willow	Salix lasiolepis	20
Douglas' meadow sweet	Spiraea douglasii	29
Total Plants		260
Total Area		3517 sq ft

The plant species were mixed throughout the new plantings areas to create diverse patches of native vegetation. A simple identification number was assigned to each new area and species type and quantities were collected for each area (Appendix B). Transplants received water immediately before and after planting. They also received water once a week for two weeks after planting.

2013 herbaceous plantings are selected for hardiness and are planted closer together than the original herbaceous plantings to increase survivability. Shrub and tree wetland species were included in this restoration effort, because deep rooted species are likely to compete well with the existing vegetation and will more than replace any vertical habitat structure that was formerly provided by the invasive species.

Each tree received a tree protector constructed from 4 foot galvanized wire fencing and secured with rebar. Once all tasks were complete, photos were taken from each of the seven photo points and compared with the initial photos from 2010 (Appendix C). In addition to photo monitoring, photos were also collected during project work (Appendix D).

2013 Vegetation Monitoring

Riparian Trees

2013 monitoring of earlier year plantings shows the riparian trees are now meeting the performance standard of “ a positive growth trend in over 35% of species (&/or plantings)”. The assessment for survival was done in mid-summer during the active growing season.

Table 4. 2013 Riparian Tree Survival Rates

2013 Survival Rates for Riparian Trees China Slide Mitigation at Hamilton Ranch		
Health	Total	Percentage
0 - Dead	8	24%
1- no main sprouts	0	0%
2- Low vitality	2	6%
3- Maintaining	3	9%
4- Vigorous	18	53%
5- Reproducing	3	9%
Found	34	100%
Planted 2010-2011	34	100%
Not found	0	0%
Condition	Total	Percentage
Vigor < 3	10	29%
Vigor > or = 3	24	71%
Percent with positive growth:		71%

Vigor Scale: Overall health and apparent vigor for riparian plantings was assessed using this numerical scale.

- 0 Dead, no evidence of recovery
- 1 Main stem dead, but basal sprouts emerging
- 2 Low vitality with evidence of biomass loss
- 3 Plant apparently not growing
- 4 Vigorous, but not optimal growth
- 5 Optimal growth (budding, new leaf growth, flowering, seeding)

Herbaceous Wetland Plants

Wetland revegetation plots were assessed using Absolute Cover estimates for the shrub/tree layer, dominant plant species and planted species within 3’X4’ solid band sample taken along permanent transects within the two successful plots. Where this could not be done because of the expanding shrub stratum, an estimate of the cover within the encroaching shrubs was determined. The 20/50 rule was used to determine dominant species (Table 5).

Table 5. Herbaceous Wetland Vegetation (2010 Plantings)

2013 Per Cent Cover (Absolute) for Wetland Vegetation China Slide Mitigation at Hamilton Ranch							
Plot	Date Sampled	% Cover Sp. Planted	% Cover Other Wetland Sp.	% Cover Upland Sp.	% Bare Ground	% Rock	Total
H - <i>Eleocharis palustris</i>	9/30/2013	72.56	51.56	0.00	4.38	0.00	128.50
I - <i>Equisetum hyemale</i>	9/30/2013	21.44	76.89	0.61	1.00	0.06	100.00
Average		47.00	64.23	0.31	2.69	0.03	114.25

Tall scouring rush and common spike rush plots are doing well from a qualitative visual perspective. The original plugs are indistinguishable as individual plants. This is a positive development and shows these rhizomatous species have grown vigorously and are successfully competing with other species. Photos of these successful plots are included here:



Above is a partial view of the *Equisetum arvense* plot surrounded by thriving volunteer willows. The photo date is 7/24/2013.



Above is a partial view of the spike rush plot (*Eliocharis palustris*) taken on 7/24/2013.

With respect to the annual performance standard (“35% of planted species must show a positive growth trend”) there are 2 successful species out of the 6 species planted in 2010. This is a 30% success rate for the initial year herbaceous plantings. With respect to the area requirement, the successful area is 36% of the required area.

IV. Maps

The Figures section for this report includes all maps.

V. Conclusions

Performance expectations are being exceeded for riparian plantings. Sixteen trees were required in the MMP (to achieve 342 square feet of riparian creation) and 24 are surviving.

However, the successful herbaceous wetland enhancement area to date is 1,453 sq. ft. This is 36% of the needed successful area (3980 sq. ft.)

Five of the nine species planted in 2013 are new to the project. A total of 13 species have been planted since March, 2010 for the purpose of achieving the square footage of restoration requirement. Consequently, in 2015 the site must have successful establishment of 8 planted species on an area exceeding 3980 square feet to meet the performance standards.

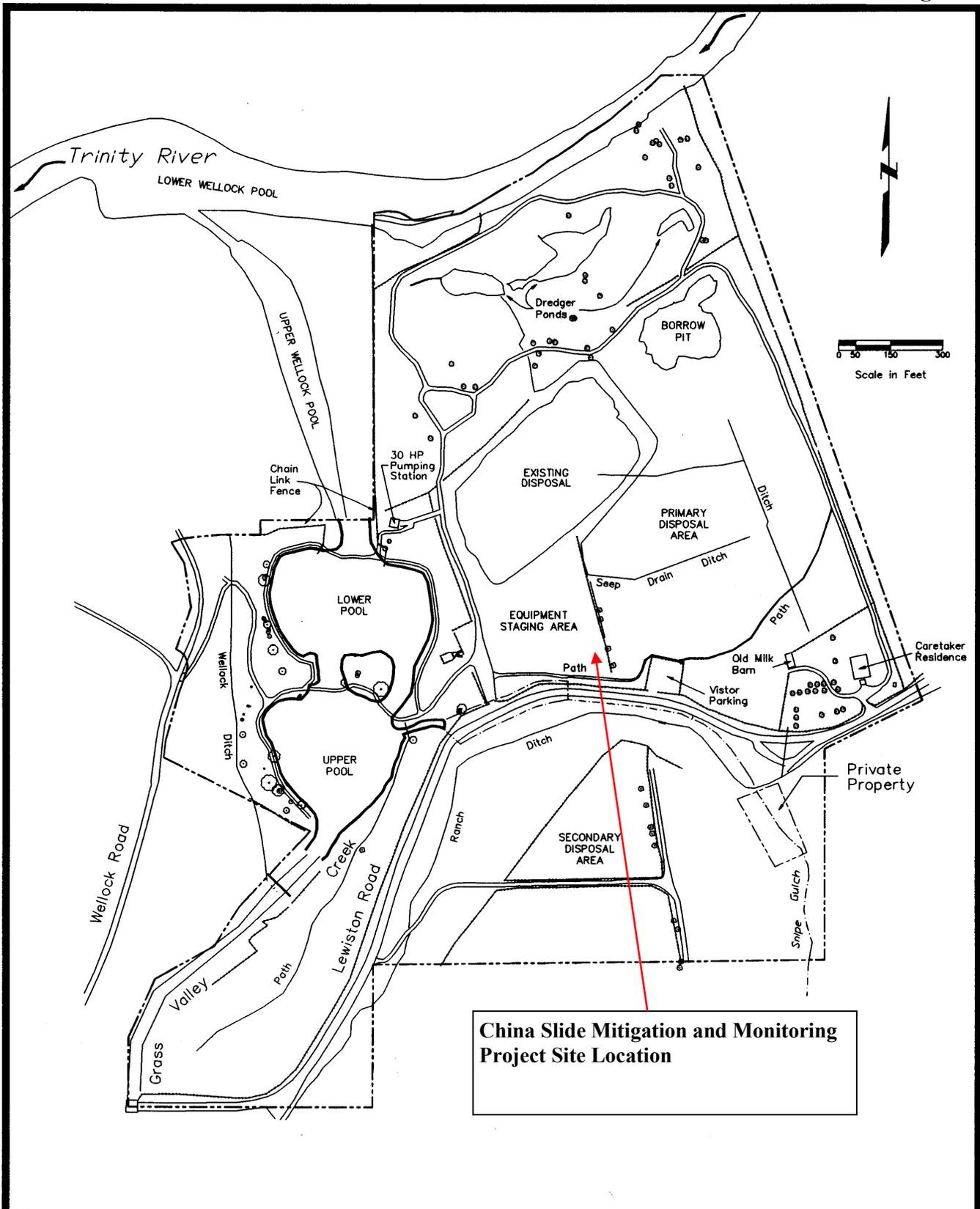
The mitigation site is gaining in natural recruitment of willows on the east and south perimeters (Figure 3). This is not part of TCRCD's and Caltrans enhancement efforts on the site, but has changed the area where herbaceous species enhancement is a practical goal. From an ecological perspective, enhancement or restoration of the wetland is a worthwhile objective primarily because of the intense burden of invasive non-native plant species. Without a focused effort, the perennial invasive non-native plant species would become dominant in this wetland in future years. In order to successfully remove the invasive non-native species from the wetland, competitive native replacements need to become established.

This is a brief context for the continuation of the Hamilton Ranch wetland restoration effort in 2013. The habitat replacement and restoration goals and requirements of the 401 and 404 Permits and MMP have been adhered to as this mitigation project is adapted to the site conditions and the "lessons learned" from earlier plantings.

Figures

Maps

Figure 1



California Department of Water Resources, Northern District
Features of the DWR-Hamilton Ranch

- Map from page 12 of the **DWR-HAMILTON RANCH MANAGEMENT PLAN, 1994**
- China Slide Mitigation and Monitoring Project Site Location added by TCRCD, 2013

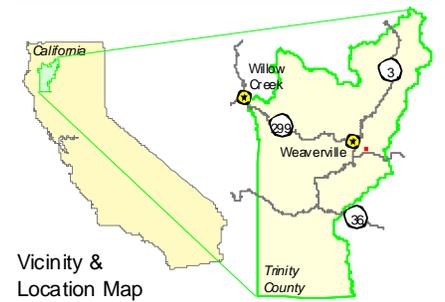


Mitigation Area at Hamilton Ranch for the China Slide Curve Improvement Project

 Planting Area

Roads

-  Highway
-  Paved
-  Rocked
-  Native
-  Trail/Undrivable



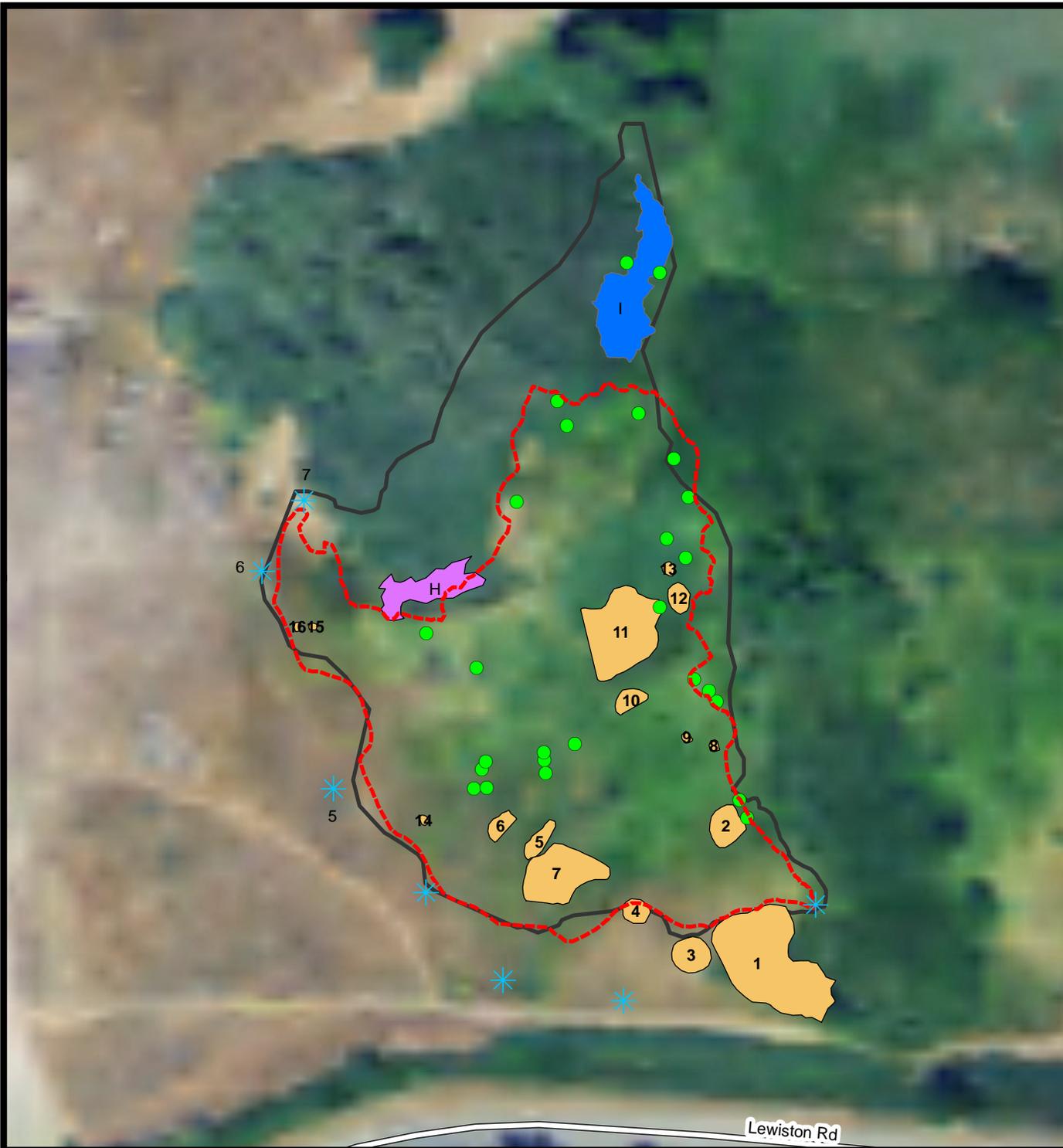
Prepared By
Trinity County
Resource Conservation District
January 12, 2010



Scale: 1 = 3,600
Hamilton_Ranch_Planting_11x8-5.mxd



China Slide MMP Phase II at Hamilton Ranch



2013 Planting Plots

3,517 SQFT

2010 Success Areas

444 SQFT

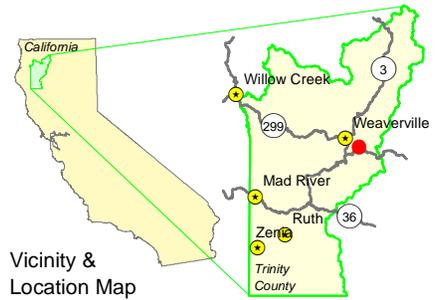
1,009 SQFT

Surviving Trees

2010 Boundary

2013 Willow Encroachment

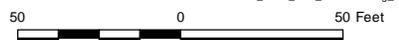
Photo Point



Vicinity & Location Map



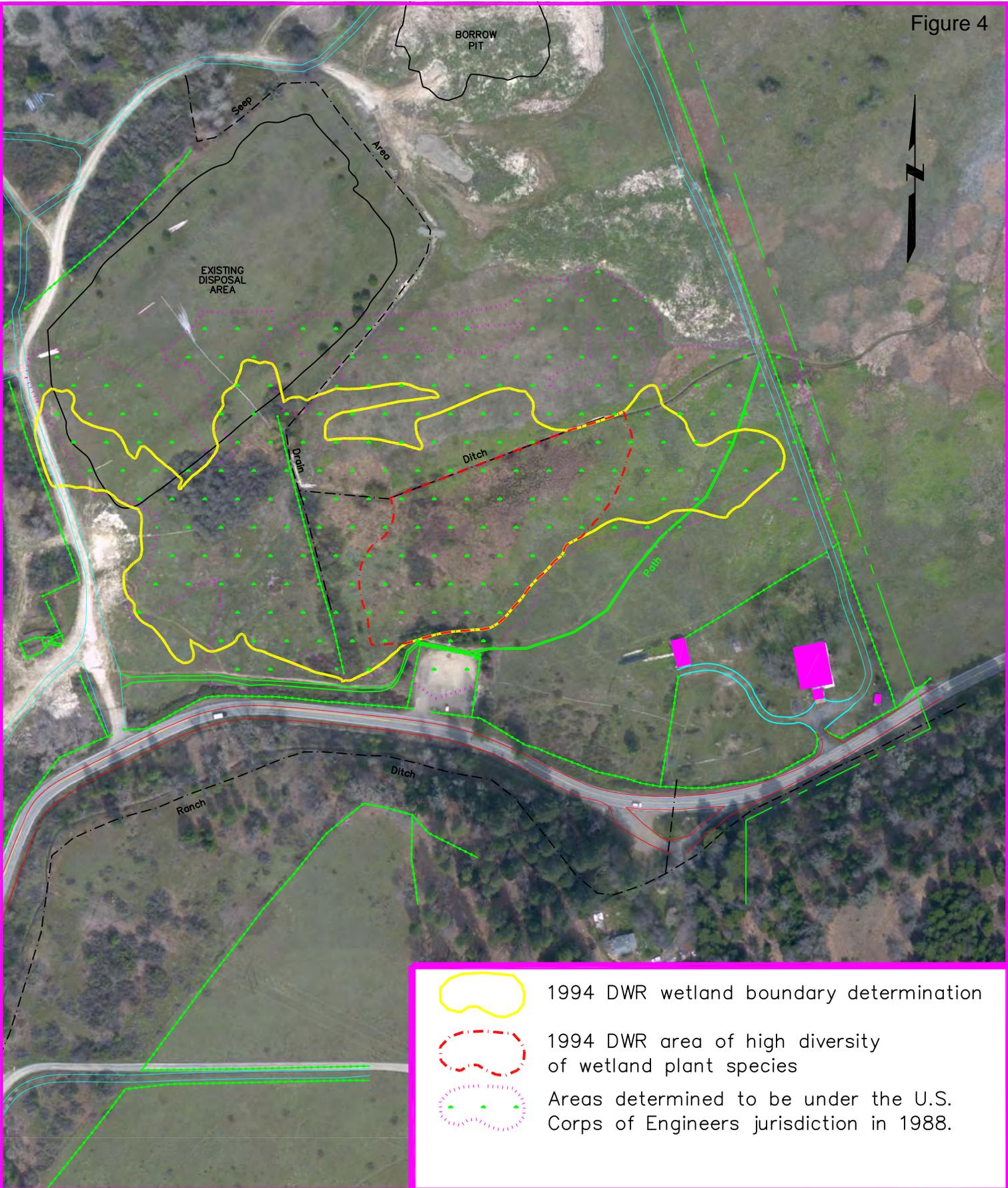
Scale: 1 = 705
1 inch = 59 feet



Prepared By
Trinity County
Resource Conservation District
December 2013

ChinaSlide_MMP_PhII_2013Planting_8.5x11.mxd

Figure 4



California Department of Water Resources, Northern District

DWR-Hamilton Ranch Wetlands in the Primary Disposal Area

Appendix A

Plant Lists

Lowden Field/Hamilton Ranch Compiled Species List

TRRP List recorded by Lacey, et al & Boggs et al, 2007

DWR List recorded by Lawrence Janeway, 1987

Present-X: found within China Slide MMP Wetland Enhancement Area by Mary Ann McCreary and/or Christy Wagner

TJM2Family	Scientific Name	Common Name	Source	Present - X	Added to List	2013 Mtns & Valleys Wetland Indicator	JM93 Former name	Cal-IPC Rating	CDFA Noxious Weed Rating	Notes
Alismataceae	<i>Alisma triviale</i>	common water plantain	DWR			OBL				
Anacardiaceae	<i>Rhus aromatica</i>	fragrant sumac	TRRP			upland	<i>Rhus trilobata</i>			
Apiaceae	<i>Conium maculatum</i>	poison hemlock	DWR/TRRP	X		FAC		Moderate		
Apiaceae	<i>Daucus carota</i>	carrot	TRRP	X		FACU				
Apiaceae	<i>Daucus pusillus</i>	rattlesnake weed	TRRP			NL				
Apiaceae	<i>Lomatium californicum</i>	California lomatium	TRRP			NL				
Apiaceae	<i>Lomatium dasycarpum</i>	wooly-fruited lomatium	TRRP			NL				
Apocynaceae	<i>Asclepias speciosa</i>	showy milkweed	DWR/TRRP			FAC				
Araceae	<i>Lemna minuta</i>	Least duckweed	DWR			OBL				
Asteraceae	<i>Achillea millefolium</i>	yarrow	TRRP			FACU				
Asteraceae	<i>Anthemis cotula</i>	stinky chamomile	DWR			FACU				
Asteraceae	<i>Artemisia douglasiana</i>	mugwort	DWR/TRRP	X		FACW				several survivors from planting
Asteraceae	<i>Centaurea solstitialis</i>	yellow starthistle	DWR/TRRP	X		NL		High	List C	
Asteraceae	<i>Cichorium intybus</i>	chicory	TRRP	X		FACU				
Asteraceae	<i>Cirsium vulgare</i>	bull thistle	DWR/TRRP	X		FACU		Moderate	List C	
Asteraceae	<i>Grindelia camporum</i>	great valley gumweed	TRRP			NL				
Asteraceae	<i>Lactuca serriola</i>	prickly lettuce	TRRP	X		FACU				
Asteraceae	<i>Leontodon taraxacoides</i>	hawkbit	TRRP			NL				
Asteraceae	<i>Leucanthemum vulgare</i>	oxeye daisy	DWR	X		FACU		Moderate		
Asteraceae	<i>Madia elegans</i>	common madia		X	08/02/13	NL				
Asteraceae	<i>Micropus californicus</i>	slender cottonseed	TRRP			FACU				
Asteraceae	<i>Pseudognaphalium stramineum</i>	cudweed	TRRP			FAC	<i>Gnaphalium stramineum</i>			
Asteraceae	<i>Psilocarphus oregonus</i>	Oregon wooly heads	TRRP			OBL				
Asteraceae	<i>Sonchus asper</i>	prickly sow thistle	DWR	X		FACU				
Asteraceae	<i>Tragopogon dubius</i>	salsify	TRRP	X		NL				
Asteraceae	<i>Wyethia angustifolia</i>	Northern mule's ears	TRRP			FACU				
Asteraceae	<i>Xanthium strumarium</i>	rough cocklebur	TRRP			FAC				
Betulaceae	<i>Alnus rhombifolia</i>	white alder	TRRP			FACW				
Betulaceae	<i>Cercocarpus betuloides</i>	mountain mahogany	TRRP			NL				
Boraginaceae	<i>Amsinckia menziesii var intermedia</i>	fiddleneck	TRRP			NL				
Boraginaceae	<i>Cynoglossum sp.</i>	houndstongue	TRRP			C. officinale is FACU, others are NL				
Boraginaceae	<i>Heliotropium curassavicum</i>	heliotrope	TRRP			OBL				

Lowden Field/Hamilton Ranch Compiled Species List

TRRP List recorded by Lacey, et al & Boggs et al, 2007

DWR List recorded by Lawrence Janeway, 1987

Present-X: found within China Slide MMP Wetland Enhancement Area by Mary Ann McCreary and/or Christy Wagner

TJM2Family	Scientific Name	Common Name	Source	Present - X	Added to List	2013 Mtns & Valleys Wetland Indicator	JM93 Former name	Cal-IPC Rating	CDFA Noxious Weed Rating	Notes
Boraginaceae	<i>Plagiobothrys stipitatus var micranthus</i>	stalked popcorn flower	DWR/TRRP			FACW				
Boraginaceae	<i>Pectocarya penicillata</i>	sleeping combseed	DWR			NL				
Brassicaceae	<i>Arabidopsis thaliana</i>	mouse ear cress	DWR			NL				
Brassicaceae	<i>Brassica nigra</i>	black mustard	TRRP	X		NL		Moderate		
Brassicaceae	<i>Capsella bursa-pastoris</i>	shepherd's purse	DWR			FACU				
Brassicaceae	<i>Draba verna</i>	spring Whitlowgrass	DWR			NL				
Brassicaceae	<i>Rorippa curvisiliqua</i>	curve-pod yellowcress	TRRP			OBL				
Brassicaceae	<i>Nasturtium officinale</i>	water-cress		X		OBL	<i>Rorippa nasturtium-aquaticum</i>			
Brassicaceae	<i>Thysanocarpus radians</i>	spokepod	TRRP			NL				
Caprifoliaceae	<i>Symphoricarpos albus</i>	common snowberry	TCRCD	X	10/21/13	FACU				
Caryophyllaceae	<i>Dianthus armeria spp armeria</i>	grass pink	TRRP			FACU				
Caryophyllaceae	<i>Minuartia sp</i>	sandwort	TRRP			NA				
Caryophyllaceae	<i>Petrorhagia dubia</i>	grass pink	TRRP			NL				
Caryophyllaceae	<i>Sagina apetala</i>	annual pearlwort	TRRP			FAC				
Caryophyllaceae	<i>Spergularia rubra</i>	ruby sandspurry	TRRP			FAC				
Convolvulaceae	<i>Convolvulus arvensis</i>	bindweed	TRRP			NL			List C	
Convolvulaceae	<i>Convolvulus sp.</i>	morning glory	TRRP			NA				
Cornaceae	<i>Cornus glabrata</i>	smooth dogwood		X	08/01/13	FACW				need flowers to confirm
Cornaceae	<i>Cornus sericea ssp sericea</i>	redosier dogwood	TRRP			FACW				Listed as <i>C. alba</i> in National Wetland Plant List
Cyperaceae	<i>Carex athrostachya</i>	long-bracted sedge	DWR	X		FACW				
Cyperaceae	<i>Carex barbarae</i>	Santa Barbara sedge	DWR/TRRP	X		FAC				dominant in large area of reference site
Cyperaceae	<i>Carex bolanderi</i>	Bolander's sedge	TRRP			FAC				
Cyperaceae	<i>Carex densa</i>	dense sedge	TRRP			OBL				
Cyperaceae	<i>Carex feta</i>	green-sheathed sedge	DWR			FACW				
Cyperaceae	<i>Carex fracta</i>	fragile-sheath sedge	TRRP			FAC				
Cyperaceae	<i>Carex integra</i>	smooth-beak sedge	TRRP			OBL				
Cyperaceae	<i>Carex leptopoda</i>	shorter scaled sedge	DWR			FAC				
Cyperaceae	<i>Carex pellita</i>	wooly sedge	DWR			OBL	<i>C. lanuginosa</i>			
Cyperaceae	<i>Carex praegracilis</i>	clustered field sedge	Lawrence Janeway	X	10/15/13					needs further ID
Cyperaceae	<i>Carex nebrascensis</i>	Nebraska sedge	TRRP			OBL				dominant to east of our area
Cyperaceae	<i>Carex sp.</i>	sedges	TRRP			NA, but generally wet				
Cyperaceae	<i>Carex stipata var stipata</i>	awl-fruited sedge	DWR	X		OBL				

Lowden Field/Hamilton Ranch Compiled Species List

TRRP List recorded by Lacey, et al & Boggs et al, 2007

DWR List recorded by Lawrence Janeway, 1987

Present-X: found within China Slide MMP Wetland Enhancement Area by Mary Ann McCreary and/or Christy Wagner

TJM2Family	Scientific Name	Common Name	Source	Present - X	Added to List	2013 Mtns & Valleys Wetland Indicator	JM93 Former name	Cal-IPC Rating	CDFA Noxious Weed Rating	Notes
Cyperaceae	<i>Carex vulpinoidea</i>	common fox sedge	DWR/TRRP			OBL				
Cyperaceae	<i>Cyperus eragrostis</i>	tall flat sedge	Lawrence Janeway	X	10/15/13	FACW				
Cyperaceae	<i>Cyperus sp.</i>	flat sedge	TRRP			NA, generally wet				
Cyperaceae	<i>Eleocharis palustris</i>	common spike rush	DWR/TRRP	X		OBL	<i>E. macrostachya</i>			Planted
Cyperaceae	<i>Eleocharis parishii</i>	Parish's spike rush	DWR			FACW				
Cyperaceae	<i>Schoenoplectus americanus</i>	American tule	TRRP			OBL	<i>Scirpus americanus</i>			
Cyperaceae	<i>Schoenoplectus tabernaemontani</i>	mountain bulrush	DWR			OBL				there is a tule on site...need spp confirmation
Cyperaceae	<i>Scirpus microcarpus</i>	small-fruited bulrush	DWR/TRRP	X		OBL				
Equisetaceae	<i>Equisetum arvense</i>	field horsetail	TRRP	X		FAC				
Equisetaceae	<i>Equisetum hyemale</i>	tall scouring rush	Caltrans/TCRCD	X		FACW				planted & doing well among willows
Ericaceae	<i>Arbutus menziesii</i>	madrone	TRRP			NL				
Fabaceae	<i>Cercis occidentalis</i>	western redbud	TRRP			UPL (<i>Cercis canadensis</i>)				
Fabaceae	<i>Lotus corniculatus</i>	bird-foot trefoil	TRRP			FAC				
Fabaceae	<i>Lotus purshianus</i>	Spanish lotus	TRRP			NL				
Fabaceae	<i>Lupinus albifrons</i>	silver bush lupine	TRRP			NL				
Fabaceae	<i>Lupinus bicolor</i>	miniature lupine	TRRP			NL				
Fabaceae	<i>Robinia pseudoacacia</i>	black locust	TRRP			FACU		Limited		
Fabaceae	<i>Trifolium dubium</i>	suckling clover	TRRP			FACU				
Fabaceae	<i>Trifolium hirtum</i>	rose clover	TRRP			NL		Moderate		
Fagaceae	<i>Quercus garryana var. garryana</i>	Oregon white oak	TRRP			FACU				
Fagaceae	<i>Quercus kelloggii</i>	Kellog's oak	TRRP			NL				
Gentianaceae	<i>Zeltnera muehlenbergii</i>	Monterey mountain-pink	TRRP	X	02/25/13	FACW	<i>Centaurium muehlenbergii</i>			
Geraniaceae	<i>Erodium botrys</i>	filaree	TRRP			FACU				
Geraniaceae	<i>Erodium cicutarium</i>	filaree	TRRP			NL		Limited		
Geraniaceae	<i>Geranium dissectum</i>	cut-leaved geranium	DWR/TRRP	X		NL				
Grossulariaceae	<i>Ribes sp.</i>	current	TCRCD	X	10/21/13	(FAC?)				R. nevedense or R. divaricatum? Needs species confirmation
Hydrophyllaceae	<i>Phacelia sp.</i>	phacelia	TRRP			NA, some sp wet				
Hypericaceae	<i>Hypericum perforatum</i>	Klamath weed	DWR/TRRP	X		FACU		Moderate	List C	
Juglandaceae	<i>Juglans nigra</i>	black walnut	TRRP	X	08/02/13	UPL				recognized in Calflora or Jepson. If walnut is truly black, it is a rare species.
Juncaceae	<i>Juncus balticus</i>	baltic rush	TRRP	X		FACW				

Lowden Field/Hamilton Ranch Compiled Species List

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Juncaceae	<i>Juncus bufonius</i>	toad rush	TRRP			FACW				
Juncaceae	<i>Juncus effusus ssp pacificus</i>	Pacific rush	DWR/TRRP	X		FACW	<i>J effusus var pacificus</i>			planted
Juncaceae	<i>Juncus ensifolius</i>	swordleaf rush	DWR			FACW				
Juncaceae	<i>Juncus exiguus</i>	common bog rush	DWR			NL				
Juncaceae	<i>Juncus laccatus</i>	lamp rush	DWR	X		FACW	<i>J effusus var gracilis</i>			
Juncaceae	<i>Juncus patens</i>	spreading rush	TRRP	X		FACW				planted
Juncaceae	<i>Juncus tenuis</i>	slender rush	DWR			FAC				
Lamiaceae	<i>Mentha arvensis</i>	Field mint		X	08/01/13	FACW				
Lamiaceae	<i>Mentha pulegium</i>	pennyroyal	TRRP			OBL		Moderate		
Lamiaceae	<i>Mentha spicata var spicata</i>	spearmint	DWR/TRRP	X		FACW				
Lamiaceae	<i>Monardella sp.</i>	monardella	TRRP			NA, generally upland				
Lamiaceae	<i>Scutellaria mexicana</i>	Mexican skullcap	TRRP			??mis-ID	<i>Salazaria mexicana</i>			
Lamiaceae	<i>Scutellaria siphocampyloides</i>	grey-leaf skullcap	TRRP			FACU				
Lamiaceae	<i>Stachys ajugoides var rigida</i>	rigid hedge nettle		X	08/01/13	OBL				bees love it...stinky mint
Linaceae	<i>Linum lewisii</i>	western blue flax	DWR			NL				
Oleaceae	<i>Fraxinus latifolia</i>	Oregon ash	TRRP	X		FACW				several volunteers
Onagraceae	<i>Clarkia purpurea ssp quadrivulnera</i>	purple clarkia	TRRP			NL				
Onagraceae	<i>Epilobium ciliatum</i>	fringed willow herb	DWR/TRRP	X		FACW				
Papaveraceae	<i>Escholzia californica</i>	California poppy	TRRP	X		NL				
Phrymaceae	<i>Mimulus moschatus</i>	Musk monkey flower (slimy)		X	08/01/13	OBL				
Pinaceae	<i>Pinus ponderosa</i>	ponderosa pine	TRRP			FACU				
Plantaginaceae	<i>Collinsia sp.</i>	Chinese-houses	DWR			(FACU?)				
Plantaginaceae	<i>Linaria dalmatica ssp dalmatica</i>	Dalmatian toadflax	TRRP			NL		Moderate		
Plantaginaceae	<i>Penstemon deustus</i>	hotrock beardtongue	TRRP			NL				
Plantaginaceae	<i>Penstemon sp.</i>	beardtongue	TRRP			NL, generally upland				
Plantaginaceae	<i>Veronica peregrina ssp. xalapensis</i>	purslane speedwell	TRRP			OBL				
Plantaginaceae	<i>Plantago erecta</i>	erect plantain	TRRP			NL				
Plantaginaceae	<i>Plantago lanceolata</i>	English plantain	TRRP			FACU		Limited		
Poaceae	<i>Agropyron sp.</i>	wheatgrass	TRRP			NL				
Poaceae	<i>Agrostis stolonifera</i>	spreading bentgrass	DWR/TRRP	X		FAC		Limited		
Poaceae	<i>Alopecurus aequalis</i>	short-awned foxtail	DWR			OBL				
Poaceae	<i>Avena barbata</i>	slender oat grass	TRRP			NL		Moderate		

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Poaceae	<i>Bromus carinatus</i>	California brome	TRRP	X	08/02/13	NL				seen near ditch
Poaceae	<i>Bromus catharticus</i>	rescue grass	TRRP			NL				
Poaceae	<i>Bromus diandrus</i>	ripgut brome	TRRP			NL		Moderate		
Poaceae	<i>Bromus hordeaceus</i>	soft brome	TRRP			FACU		Limited		
Poaceae	<i>Bromus japonicus</i>	Japanese brome	TRRP			NL		Limited		
Poaceae	<i>Bromus tectorum</i>	cheat grass	TRRP			NL		High		
Poaceae	<i>Cynosurus echinatus</i>	hedgehog dogtail	TRRP			NL		Moderate		
Poaceae	<i>Dactylis glomerata</i>	orchard grass	TRRP	X		FACU		Limited		
Poaceae	<i>Deschampsia danthonioides</i>	annual hairgrass	TRRP			FACW				
Poaceae	<i>Elymus elymoides</i>	western bottle brush grass	TRRP			FACU				
Poaceae	<i>Elymus glaucus</i>	blue wild rye	TRRP	X		FACU				
Poaceae	<i>Elymus multisetus</i>	big squirrel tail	TRRP			NL				
Poaceae	<i>Festuca californica</i>	California fescue	TRRP			FACU				
Poaceae	<i>Festuca pratensis</i>	meadow fescue	TRRP			FACU				
Poaceae	<i>Glyceria occidentalis</i>	western mannagrass	DWR			OBL				
Poaceae	<i>Holcus lanatus</i>	common velvet grass	DWR/TRRP	X		FAC		Moderate		
Poaceae	<i>Hordeum jubatum</i>	fox-tail barley	TRRP			FAC				
Poaceae	<i>Hordeum marinum ssp gussoneanum</i>	sea-side barley	TRRP			FAC				
Poaceae	<i>Hordeum murinum ssp leporinum</i>	wall barley	TRRP			FAC				
Poaceae	<i>Elymus caput-medusae</i>	medusa head	TRRP			NL	<i>Taeniatherum caput-medusae</i>			
Poaceae	<i>Elymus triticoides</i>	creeping wild rye	TRRP	X		FAC				
Poaceae	<i>Melica californica</i>	California melic grass	TRRP			NL				
Poaceae	<i>Dichanthelium acuminatum</i>	western witch grass	TRRP			FAC	<i>Panicum acuminatum</i>			
Poaceae	<i>Phalaris paradoxa</i>	mediterranean canary grass	TRRP			FAC				
Poaceae	<i>Phleum pratense</i>	common timothy	DWR/TRRP			FAC				
Poaceae	<i>Phleum sp.</i>	mountain timothy?	TRRP			would be FAC				
Poaceae	<i>Poa palustris</i>	fowl blue grass	TRRP			FAC				
Poaceae	<i>Poa pratensis</i>	Kentucky blue grass	DWR/TRRP	X		FAC		Limited		
Poaceae	<i>Poa secunda</i>	curly blue grass	TRRP			FACU				
Poaceae	<i>Polypogon monspeliensis</i>	rabbit's foot grass	DWR			FACW		Limited		
Poaceae	<i>Polypogon maritimus</i>	maritime rabbit's foot grass	TRRP			OBL				
Poaceae	<i>Schedonorus arundinaceus</i>	tall false rye-grass	DWR	X		FAC	<i>Festuca arundinacea</i>	Moderate		big bunches

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Poaceae	<i>Vulpia microstachys</i>	small fescue	TRRP			NL				
Poaceae	<i>Vulpia myuros</i>	rat-tail fescue	TRRP			FACU		Moderate		
Polemoniaceae	<i>Navarretia intertexta</i>	needle-leaved pincushion plant	TRRP			FACW				
Polygonaceae	<i>Eriogonum nudum</i>	naked buckwheat	TRRP			NL				
Polygonaceae	<i>Persicaria maculosa</i>	spotted ladysthumb	DWR			FACW	<i>Polygonum persicaria</i>			
Polygonaceae	<i>Persicaria pensylvanica</i>	pinkweed, smartweed		X		FACW	<i>Polygonum pensylvanica</i>			Collection needed. Could be <i>Persicaria lapathifolia</i>
Polygonaceae	<i>Polygonum sp.</i>		DWR/TRRP			NA, many sp wet				
Polygonaceae	<i>Rumex acetosella</i>	sheep sorrel	TRRP			FACU		Moderate		
Polygonaceae	<i>Rumex crispus</i>	curly dock	DWR/TRRP	X		FAC		Limited		
Portulacaceae	<i>Claytonia perfoliata</i>	miners lettuce	TRRP			FAC				
Pteridaceae	<i>Cheilanthes sp.</i>	Bracken fern	TRRP			NA, all native upl				
Ranunculaceae	<i>Clematis ligusticifolia</i>	virgins bower	TRRP			FAC				
Ranunculaceae	<i>Ranunculus sp.</i>	buttercup	TRRP			NA, many wet				
Rhamnaceae	<i>Ceanothus cuneatus</i>	buck brush	TRRP			NL				
Rhamnaceae	<i>Ceanothus integerrimus</i>	deer brush	TRRP			NL				
Roasaceae	<i>Crataegus gaylussacia</i>	Klamath hawthorn	Caltrans	X	08/02/13	FAC	<i>Crataegus suksdorfii</i>			Confirm ID and make collection
Roasaceae	<i>Malus sylvestris</i>	apple	TRRP			NL				
Rosaceae	<i>Potentilla glandulosa</i>	sticky cinquefoil	TRRP			FAC				
Rosaceae	<i>Prunus subcordata</i>	Sierra plum		X	08/01/13	NL, watch to confirm				
Rosaceae	<i>Rosa californica</i>	California wild rose	DWR/TRRP			FAC				
Rosaceae	<i>Rosa rubiginosa</i>	sweet-brier	DWR	X	07/24/13	FACW	<i>Rosa eglanteria</i>			NOXIOUS?
Rosaceae	<i>Rubus armeniacus</i>	Himalaya blackberry	DWR/TRRP	X		NL	<i>Rubus discolor</i>	High		
Rosaceae	<i>Rubus laciniatus</i>	cut-leaved blackberry	DWR/TRRP	X		FACU				NOXIOUS?
Rosaceae	<i>Spiraea douglasii</i>	Douglas' meadowsweet	TCRCD	X	10/22/13	FACW				Planted 10/22/13
Rubiaceae	<i>Galium aparine</i>	goose grass	TRRP			FACU				
Salicaceae	<i>Populus trichocarpa</i>	black cottonwood	DWR	X		FAC	<i>Populus balsamifera</i>			(planted)
Salicaceae	<i>Salix exigua</i>	narrow-leaved willow	DWR/TRRP	X		FACW				
Salicaceae	<i>Salix lasiolepis</i>	arroyo willow	TRRP	X		FACW				Planted & present
Salicaceae	<i>Salix laevigata</i>	red willow		X	08/02/13	FACW				Planted & present
Salicaceae	<i>Salix lasiandra var lasiandra</i>	shining willow	DWR/TRRP	X		FACW				Planted & present
Scrophulariaceae	<i>Verbascum thapsus</i>	woolly mullein	TRRP	X		FACU		Limited		
Scrophulariaceae	<i>Verbascum blattaria</i>	moth mullein		X	08/02/13	UPL				

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Typhaceae	<i>Typha angustifolia</i>	narrow-leaved cattail	TRRP		09/25/13	OBL				
Verbenaceae	<i>Typha sp.</i>	cattail	DWR	X	09/26/13	OBL				
Vitaceae	<i>Verbena hastata</i>	Simpler's joy	TRRP			FAC				If found, collect specimen
	<i>Vitis californica</i>	California grape	TRRP			FACU				
Native hydrophytes										
non-native hydrophytes										
native upland spp										
non-native upland spp										
Noxious weed. See rating columns										

Appendix B

Plot Descriptions

Plot 1

Common Name	Scientific Name	Quantity
Santa Barbara sedge	Carex barbarae	9
creeping wild rye	Elymus triticoides	37
Oregon ash	Fraxinus latifolia	1
Fremont cottonwood	Populus fremontii	1
arroyo willow	Salix lasiolepis	2
Douglas' meadow sweet	Spiraea douglasii	14
Total		64

Plot 2

Common Name	Scientific Name	Quantity
creeping wild rye	Elymus triticoides	20
arroyo willow	Salix lasiolepis	4
Total		24

Plot 3

Common Name	Scientific Name	Quantity
creeping wild rye	Elymus triticoides	30
red willow	Salix laevigata	2
Douglas' meadow sweet	Spiraea douglasii	1
Total		33

Plot 4

Common Name	Scientific Name	Quantity
creeping wild rye	Elymus triticoides	12
red willow	Salix laevigata	1
Total		13

Plot 5

Common Name	Scientific Name	Quantity
Oregon ash	Fraxinus latifolia	1
Douglas' meadow sweet	Spiraea douglasii	5
Total		6

Plot 6

Common Name	Scientific Name	Quantity
Santa Barbara sedge	Carex barbarae	10
arroyo willow	Salix lasiolepis	2
Douglas' meadow sweet	Spiraea douglasii	5
Total		17

Plot 7

Common Name	Scientific Name	Quantity
Santa Barbara sedge	Carex barbarae	18
Oregon ash	Fraxinus latifolia	2
common rush	Juncus effusus	5
grey rush	Juncus patens	5
arroyo willow	Salix lasiolepis	3
Total		33

Plot 8

Common Name	Scientific Name	Quantity
red willow	Salix laevigata	1
Total		1

Plot 9

Common Name	Scientific Name	Quantity
red willow	Salix laevigata	1
Total		1

Plot 10

Common Name	Scientific Name	Quantity
Santa Barbara sedge	Carex barbarae	14
Total		14

Plot 11

Common Name	Scientific Name	Quantity
Santa Barbara sedge	Carex barbarae	16
Oregon ash	Fraxinus latifolia	2
common rush	Juncus effusus	10
grey rush	Juncus patens	10
arroyo willow	Salix lasiolepis	6
Total		44

Plot 12

Common Name	Scientific Name	Quantity
red willow	Salix laevigata	2
Douglas' meadow sweet	Spiraea douglasii	4
Total		6

Plot 13

Common Name	Scientific Name	Quantity
red willow	Salix laevigata	1
Total		1

Plot 14

Common Name	Scientific Name	Quantity
arroyo willow	Salix lasiolepis	1
Total		1

Plot 15

Common Name	Scientific Name	Quantity
arroyo willow	Salix lasiolepis	1
Total		1

Plot 16

Common Name	Scientific Name	Quantity
arroyo willow	Salix lasiolepis	1
Total		1

Appendix C

Photo Monitoring

Photo Point Comparison Year 2010 and Year 2013

Seven permanent photo points were established when the mitigation area was established. On each page, the top photo was taken in September, 2010 with exception to photo point 2. The bottom photo set was taken in October, 2013 after noxious weed removal and new plantings were installed.

Photo Point 1—Northwest



September, 2010
Red arrows show location of sweetbriar



October, 2013
Sweetbriar has been removed

Photo Point 2—North



March, 2010
Red arrows show location of blackberry and sweetbriar patch



October, 2013
Blackberry and sweetbriar have been removed

Photo Point 3—North

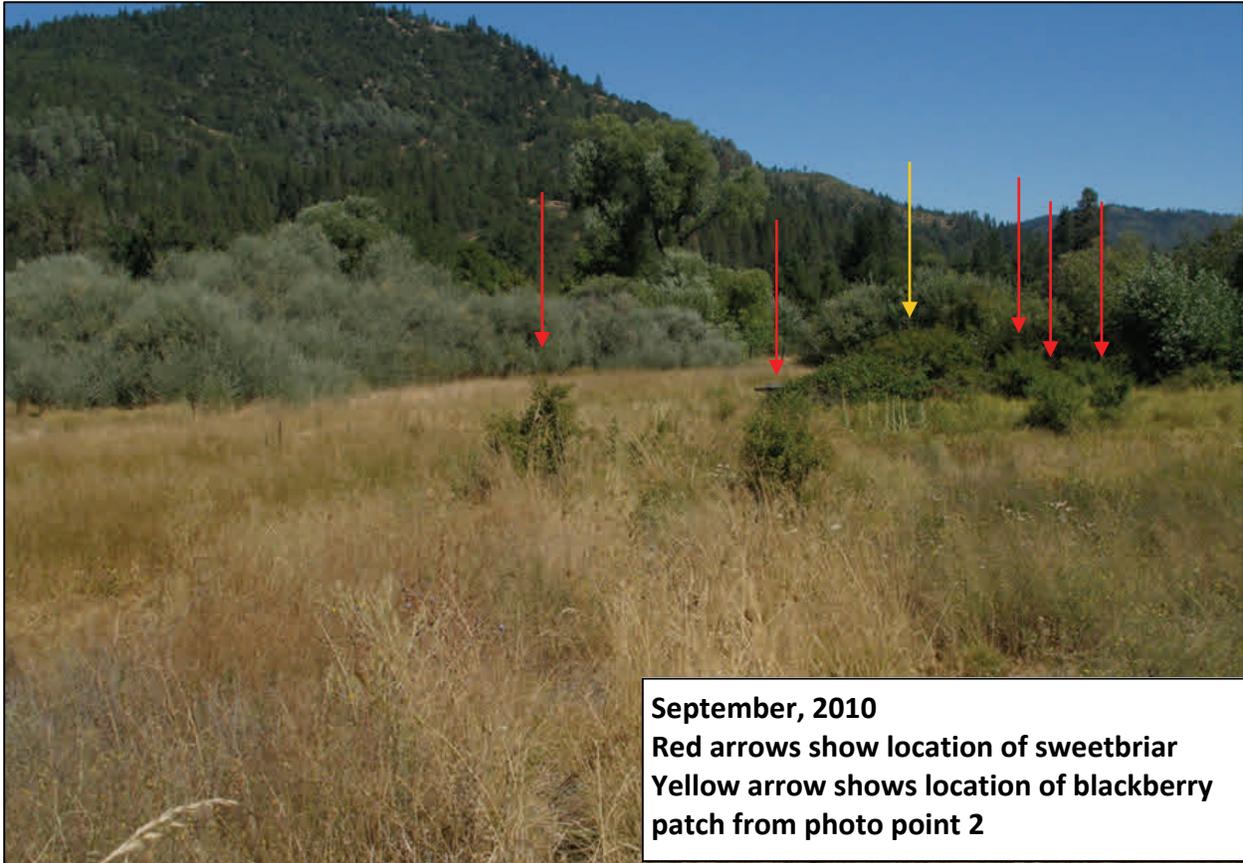


Photo Point 4—Northeast



September, 2010
Red arrows show location of sweetbriar



October, 2013
Sweetbriar has been removed

Photo Point 5—Northeast



Photo Point 6—Southeast



**Photo Point 7—
Southeast**



Appendix D

Additional Photos

Noxious and Invasive Plant Species Treatment



**Trinity River Conservation Camp crew loading sweetbriar and blackberry material into trailer for disposal.
We removed 5 trailer loads from the site in 2 days.**



Trinity River Conservation Camp crew digging out large sweetbriar root mass.



Trinity River Conservation Camp crew beginning to remove large blackberry and sweetbriar patch. They began with chainsaws and finished by manually removing root by hand and with hand tools.

Compare photo with planting plot 11.

Planting after Weed Treatment



Trinity River Conservation Camp crew member planting plot 7. Each hole received a 5 gallon bucket of water before the plant was installed.



Trinity River Conservation Camp crew member planting plot 3 (front and center).



Plot 11 after blackberry and sweetbriar removal.



Willow cluster planted in January, 2011 from cuttings. Cluster is located in the middle of the site.



Looking out across plot 7 at herbaceous and woody plantings.



Herbaceous and woody plantings in plot 3.



Plots 11, 12 and 13 after blackberry and sweetbriar removal and installation of *Juncus* spp, *Carex* sp, and riparian tree species.



Plots 12 and 13