

Appendix K Vegetation Sampling of Proposed
(Group 1) Wetland Establishment
Sites

Memorandum

Date:	August 10, 2010
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Subject:	Willits Bypass Project—Vegetation Sampling at Proposed Wetland Establishment Sites

1. Introduction

This technical memorandum addresses item 6 under the “Wetland Establishment” heading on the Willits Bypass Project (bypass project) “punch list” prepared by the North Coast Regional Water Quality Control Board (RWB), U.S. Army Corps of Engineers (USACE), and U.S. Environmental Protection Agency (USEPA) following a meeting held at the RWB Santa Rosa office on July 12 and 13, 2010. The punch list includes items necessary for permitting the bypass project under the Clean Water Act (CWA) Section 404. The punch list is meant to be a summary of all agency requests for information up to the meeting date of July 12 and 13. The list was also designed to capture all the information requested in a letter to Caltrans received from the USACE dated July 9, 2010 (July 9 letter). The July 9 letter also includes a section under wetland establishment which requests information on the existing conditions of the vegetation on the wetland establishment sites [bullets occurring after item 4.c.1.] Required items include:

- 1) Existing conditions: We generally have a list of the species that occur on site from the delineation that were completed. For each wetland establishment site we need:
 - Species characteristics such as: ~~densities, age, health~~¹, natives/nonnative.
 - Percent cover.
 - ~~Community structure (canopy stratification)~~¹.
 - Map showing the correct location of plant communities with representative site photos.

¹ During the July 12 and 13 meeting, the items shown as strikethrough were agreed to be removed from the requirements. The target wetland habitats to be established are wet meadow and mixed marsh, which include herbaceous plants. Therefore information which would be collected on woody plants was eliminated.

- Proposed site should be located adjacent to existing waters of the U.S. or a high functioning buffer adjacent to waters of the U.S. to create a wildlife corridor. Provide documentation of this connectivity.²

2. Context for Work

As part of the compensatory mitigation program for the Willits Bypass Project, wetland establishment (i.e., wet meadow or mixed marsh) is proposed on six offsite mitigation parcels in Little Lake Valley (Table 1). For ease of discussion the Goss, MGC Plasma Middle, and MGC Plasma North offsite mitigation parcels, which are adjacent to each other, are discussed together.

Table 1. Proposed Wetland Establishment Sites at the Offsite Mitigation Parcels

Offsite Mitigation Parcel	Assessor's Parcel Number	Proposed Wetland Establishment (acres)
Ford	108-010-06	2.854
Goss	103-230-02	0.553
MGC Plasma Middle	103-250-14	0.233
MGC Plasma North	103-230-06	6.691
Niesen	108-040-02	5.666
Watson East	037-221-30	8.336
	Total	24.333

3. Suitability for Wetland Establishment

On each establishment parcel, vegetation was sampled quantitatively to document existing conditions as part of justification for proposing establishment at the parcel (Figure 1). Information from the vegetation sampling will also be used to confirm the plant palettes and seed mixes for each establishment site. The following areas of each establishment parcel were sampled:

- Existing herbaceous vegetation within the proposed wetland establishment site.
- Existing vegetation in the surrounding herbaceous wetlands within 100 meters of the establishment site.
- Existing vegetation in the proposed wetland establishment monitoring reference site.

Please note that other information on hydrology and soils collected and developed as part of justification for proposing establishment on the offsite mitigation parcels is presented in separate technical memoranda.

4. Methods

4.1 Objectives

The intent of this study was to sample existing wetland vegetation present on the establishment parcels and use that information, then to identify the types of wetland plant communities and map

² This information is included in the Watershed Information Technical Memorandum dated August 10, 2010.

those communities on the parcels. In addition, the plant community information would be used to further refine plant palettes and seed mixes for each proposed established wetland site.

The vegetation was sampled in the proposed establishment sites, in surrounding existing wet meadow and/or mixed marsh, and in the proposed wetland establishment monitoring reference sites to collect quantitative data on plant cover that would be used to calculate the following wetland habitat characteristics (from the Mitigation and Reporting Plan [MRP; RWB 2010]):

- relative percent vegetation cover by native wetland species,
- absolute percent vegetation cover by native wetland plants,
- absolute percent vegetation cover by wetland species,
- native species richness, and
- absolute percent cover by invasive species.

4.2 Field Data Collection

Each offsite mitigation parcel where wetland establishment is proposed was sampled, with the exception of MGC Plasma Middle, which is immediately south of MGC Plasma North. Only a very small portion of this parcel is proposed to be graded to establish wetlands; the majority of the grading will occur on the adjacent MGC Plasma North and Goss parcels.

The sampling method generally followed the California Native Plant Society (CNPS) field sampling protocol (Sawyer and Keeler-Wolf 1995). Vegetation sampling was conducted on July 21, 22, 23, 26 and 27, 2010 by botanists experienced in California wetland and invasive plant identification and survey methods.

Transects were established in the proposed establishment sites, surrounding existing wet meadow and/or mixed marsh, and in the proposed wetland establishment monitoring reference sites. The transects were uniformly distributed across each area being sampled. Before the field survey, a series of parallel transects spaced approximately 100 meters apart, oriented parallel across the parcel's width were plotted on field maps. These transects were adjusted in the field to better represent vegetation diversity in each of the three areas being sampled. Once established, each transect was subdivided into 100 meter segments and each 100 meter segment was sub-sampled. Transect segments that were greater than 50 meters long but less than 100 meters long were also sampled. The location of transects, sampling plots, and the USACE verified jurisdictional wetlands is shown in Figure 1.

Within each 100 meter segment on the transect a 50 meter long point transect was established, centered in a 50 meter by 5 meter plot. The start point of each plot was randomly located along each 100 meter segment using a random number between 0 and 50. Point intercept sampling (Elzinga et al 1998) was performed at 0.5 meter intervals beginning at 0.5 meter and ending at 50.0 meters along each 50 meter transect. At each interval a point was projected vertically into the vegetation and each species intercepted by a point was recorded on a data collection form.

In addition to the point intercept sampling in the plot, a full census of species occurring in the plot (both native and nonnative) was conducted and recorded on a data collection form. As applicable, each plant species was assigned a wetland indicator status following Reed (1988). See Attachment 2

for the definition of wetland indicator status in Reed (1988). Plants with an indicator status of FAC or wetter were classified as wetland plants. Scientific names of plants follow Reed (1988) and *The Jepson Manual* (Hickman 1993) as updated by the Jepson Interchange, an online database maintained by the Jepson and University Herbaria (University of California Berkeley 2010).

Ground-level digital images of each plot were taken and the compass direction of the image was recorded on a data collection form (Attachment 1).

Percent cover for each species and plant community type was determined from the point intercept data. Species richness was determined by the full census survey of the plot.

4.3 Identification of Plant Communities

A plant community can be defined as a recognizable assemblage of plants that is relatively homogeneous in structure and plant composition and that can be distinguished from adjacent communities by a clear boundary (Grossman et al. 1998). Plant communities were identified following the classification system in *A Manual of California Vegetation* (Sawyer et al. 2009), which is a hierarchical system that combines broad habitat type and ecological modifiers at the highest levels of the hierarchy, and floristics (i.e., dominant plant species) at the lowest levels. The basic lower level vegetation unit recognized in the field is the alliance, identified using both qualitative and quantitative data, and based on the dominant plant species in the upper layer of vegetation or characteristic species.

Identification of plant communities was based on the quantitative vegetation data collected. The point-intercept data collected in the field was used to calculate the absolute and relative cover of each species. Absolute and relative cover was also calculated for native versus nonnative species, and wetland versus upland species. Using these data, the plant community in each plot was identified as an alliance as described in Sawyer et al. (2009) if it met *either* 1) the bolded narrative description of the alliance (provided at the start of each alliance description), *or* 2) one of the membership rules described for the alliance by other authors. Plant communities that did not meet a vegetation alliance description in Sawyer et al. (2009) were identified according to previous plant community lists (Holland 1986; DFG 2003; DFG 2007).

Once plant communities were identified using the quantitative data, polygons were drawn around the boundaries of each plant community using a combination of field reconnaissance and aerial photograph interpretation (Figure 2). Plant communities were only mapped for herbaceous communities since the goal for the wetland establishment areas will be to establish herbaceous wetland communities.

5. Results

Figure 1 shows the location of the vegetation sampling transects and plots. Figure 2 shows the location of herbaceous plant community types. Attachment 1 shows ground-level digital images of each plot and the compass direction of the digital image. In most cases the digital images are in order of plot start (west side of plot) and plot end (east side of plot). Attachment 2 contains a list of the plants observed in each plot as well as their wetland indicator status (Reed 1988), whether they are native or nonnative (Hickman 1993) and whether they are considered invasive as defined in the MMP (California Department of Transportation 2010, Appendix H, Table 2-1).

In total, 28 plots were sampled at the wetland establishment parcels. Since the intention of this study was to determine the existing wetland plant communities present on the parcels and to use that information to determine the type of wetland plant community to be established at each wetland establishment site, the following discussions highlight the differences between the observed current upland wetland establishment sites and the surrounding existing wetlands.

5.1 Summary of Cover Types, Species Richness and Plant Community Types Observed

A summary of the vegetation characteristics of each plot (including relative percent vegetation cover by native wetland species, absolute percent vegetation cover by wetland species, native species richness, and absolute percent cover by invasive species) is provided in Table 2. The plant community types are provided for each plot in Table 3. The rationale for assigning each plot to a particular plant community type is also provided in Table 3.

Table 2. Summary of Vegetation Characteristics at Offsite Mitigation Parcels where Wetland Establishment is Proposed

Mitigation Parcel	Plot	Species Richness (Number of Species in Plot)			Wetland Plant Cover		Invasive Species	
		Total	Native	Nonnative	Absolute % Cover Wetland Plants	Relative % Cover Native Wetland Plants	Absolute % Cover Native Wetland Plants	Absolute % Cover
Ford	Plot 1	16	3	13	21	0	0	16
Ford	Plot 2	20	7	13	13	34	47	0
Ford	Plot 3	21	4	17	35	0	0	14
Ford	Plot 4	22	9	13	100	23	28	0
Ford	Plot 5	6	5	1	218	100	218	0
Goss	Plot 1	15	4	11	94	10	10	0
Goss	Plot 2	16	5	11	91	15	14	0
MGC Plasma North	Plot 1	20	7	13	108	25	27	0
MGC Plasma North	Plot 2	26	9	17	89	35	35	0
MGC Plasma North	Plot 3	23	8	15	95	18	18	0
MGC Plasma North	Plot 4	32	14	18	96	35	39	0
MGC Plasma North	Plot 5	27	8	19	93	31	34	0
Niesen	Plot 1	21	6	15	166	35	74	0
Niesen	Plot 2A	22	12	10	128	69	96	0
Niesen	Plot 2B	22	6	16	61	4	9	0
Niesen	Plot 3A	30	5	25	74	0	0	0
Niesen	Plot 3B	28	11	17	23	1	2	18
Niesen	Plot 5	21	4	17	69	0.5	1	0
Niesen	Plot 6	37	10	27	133	7	15	0
Niesen	Plot 7	28	7	21	100	0.5	1	0
Watson East	Plot 1	22	6	16	102	25	26	0
Watson East	Plot 2	24	7	17	88	27	29	0
Watson East	Plot 3	29	8	21	111	22	32	0
Watson East	Plot 4	33	16	17	111	29	39	0
Watson East	Plot 5	30	8	22	67	19	22	1
Watson East	Plot 6	32	12	20	135	52	79	0
Watson East	Plot 7	31	16	15	123	58	94	0

Table 3. Vegetation Alliances and Plant Community Types Identified at Each Offsite Mitigation Parcel where Wetland Establishment is Proposed

Parcel	Plot	Vegetative Alliance and Source (<i>Scientific Name</i>)	Comments
Ford	1	Annual Brome Grassland (Sawyer et al. 2009) (<i>Bromus [diandrus, hordeaceus]</i> – <i>Brachypodium distachyon</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. <i>B. hordeaceus</i> relative cover = 45%, total non-native relative cover = 89% 2. Meets one membership rule of >80% relative cover of <i>B. hordeaceus</i> co-dominant with non-natives. 3. Nearly meets a second membership rule of >50% relative cover of <i>B. hordeaceus</i>.
	2	Wet Montane Meadow (Holland 1986) <i>or</i> Rush Riparian Grassland (DFG 2003)	<ol style="list-style-type: none"> 1. 34% relative cover of natives. 2. Several different species are dominant and data does not meet any membership rules in Sawyer et al. 2009.
	3	Annual Brome Grassland (Sawyer et al. 2009) (<i>Bromus [diandrus, hordeaceus]</i> – <i>Brachypodium distachyon</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. <i>B. hordeaceus</i> relative cover = 28%, total non-native relative cover = 95% 2. Meets one membership rule of >80% relative cover of <i>B. hordeaceus</i> co-dominant with non-natives.
	4	Wet Montane Meadow (Holland 1986) <i>or</i> Rush Riparian Grassland (DFG 2003)	<ol style="list-style-type: none"> 1. 23% relative cover of natives. 2. Several different species are dominant and data does not meet any membership rules in Sawyer et al. 2009.
	5	Hardstem Bulrush Marsh (Sawyer et al. 2009) (<i>Schoenoplectus acutus</i> herbaceous)	<ol style="list-style-type: none"> 1. <i>S. acutus</i> = 215% absolute cover. 2. Meets membership rule.
Goss	1	Bent Grass–Tall Fescue Meadow (Sawyer et al. 2009) (<i>Agrostis [gigantea, stolonifera]</i> – <i>Festuca arundinacea</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>F. arundinacea</i> = 74%. 2. Meets verbal description of alliance but not membership rule.
	2	Bent Grass–Tall Fescue Meadow (Sawyer et al. 2009) (<i>Agrostis [gigantea, stolonifera]</i> – <i>Festuca arundinacea</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>F. arundinacea</i> = 73%. 2. Meets verbal description of alliance but not membership rule.
MGC Plasma North	1	Bent Grass–Tall Fescue Meadow (Sawyer et al. 2009) (<i>Agrostis [gigantea, stolonifera]</i> – <i>Festuca arundinacea</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>F. arundinacea</i> = 71%. 2. Meets verbal description of alliance but not membership rule
	2	Bent Grass–Tall Fescue Meadow (Sawyer et al. 2009) (<i>Agrostis [gigantea, stolonifera]</i> – <i>Festuca arundinacea</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>F. arundinacea</i> = 47%. 2. Notably high relative cover of native perennial <i>Danthonia californica</i> = 21%. 3. Meets verbal description of alliance but not membership rule.
	3	Perennial Rye Grass Field (Sawyer et al. 2009) (<i>Lolium perenne</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>L. multiflorum</i> = 35%, relative cover of all nonnatives = 82%. No plant with cover greater than <i>L. multiflorum</i>. 2. Meets verbal description of alliance but not membership rules.

Parcel	Plot	Vegetative Alliance and Source (<i>Scientific Name</i>)	Comments
	4	Bent Grass–Tall Fescue Meadow (Sawyer et al. 2009) (<i>Agrostis (gigantea, stolonifera)</i> – <i>Festuca arundinacea</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>F. arundinacea</i> and <i>Agrostis</i> sp. = 39%. 2. Meets verbal description of alliance but not membership rule.
	5	Bent Grass–Tall Fescue Meadow (Sawyer et al. 2009) (<i>Agrostis (gigantea, stolonifera)</i> – <i>Festuca arundinacea</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>F. arundinacea</i> = 49%. 2. Notably high relative cover of native perennial <i>Danthonia californica</i> = 17%. 3. Meets verbal description of alliance but not membership rule.
Niesen	1	Italian Ryegrass Grassland (DFG 2003)	<ol style="list-style-type: none"> 1. Pasture is highly disturbed and covered mostly by two low growing annuals, <i>Juncus bufonius</i> and <i>Lythrum hyssopifolia</i>. 2. Community was classified by plant with highest cover that has a community defined by DFG 2003.
	2A (NW)	Wet Montane Meadow (Holland 1986) <i>or</i> Rush Riparian Grassland (DFG 2003)	<ol style="list-style-type: none"> 1. Relative cover of native <i>Phalaris arundinacea</i> = 53%, relative cover of rushes = 13%. 2. Data does not meet any membership rules in Sawyer et al. 2009.
	2B (43m)	Wet Montane Meadow (Holland 1986)	<ol style="list-style-type: none"> 1. Relative cover of nonnative <i>Phleum pretense</i> = 59%, very little cover of rushes. 2. Data does not meet any membership rules in Sawyer et al. 2009.
	3A	Annual Brome Grassland (Sawyer et al. 2009) (<i>Bromus [diandrus, hordeaceus]</i> – <i>Brachypodium distachyon</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative <i>B. hordeaceus</i> cover = 36%, relative nonnative cover = 99%. 2. Meets verbal description of alliance with cover of nonnatives.
	3B	Annual Brome Grassland (Sawyer et al. 2009) (<i>Bromus [diandrus, hordeaceus]</i> – <i>Brachypodium distachyon</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative <i>B. hordeaceus</i>, <i>B. diandrus</i> cover = 42%, relative nonnative cover = 97% 2. Meets verbal description of alliance with cover of nonnatives.
	5	Annual Brome Grassland (Sawyer et al. 2009) (<i>Bromus [diandrus, hordeaceus]</i> – <i>Brachypodium distachyon</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative <i>B. hordeaceus</i> cover = 21%, relative nonnative cover = 90% 2. Meets verbal description of alliance with cover of nonnatives.
	6	Bent Grass–Tall Fescue Meadow (Sawyer et al. 2009) (<i>Agrostis (gigantea, stolonifera)</i> – <i>Festuca arundinacea</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>F. arundinacea</i> = 43%, no other species with greater cover. 2. Meets verbal description of alliance but not membership rule.
	7	Bent Grass–Tall Fescue Meadow (Sawyer et al. 2009) (<i>Agrostis (gigantea, stolonifera)</i> – <i>Festuca arundinacea</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>F. arundinacea</i> = 40%, no other species with greater cover. 2. Meets verbal description of alliance but not membership rule.

Parcel	Plot	Vegetative Alliance and Source (<i>Scientific Name</i>)	Comments
Watson East	1	Perennial Rye Grass Field (Sawyer et al. 2009) (<i>Lolium perenne</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>L. multiflorum</i> = 53%, relative cover of all nonnatives = 75%. 2. Sawyer et al. 2009 does not recognize distinction between <i>L. perenne</i> and <i>L. multiflorum</i> 3. Meets verbal description of alliance but not membership rules.
	2	Perennial Rye Grass Field (Sawyer et al. 2009) (<i>Lolium perenne</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>L. multiflorum</i> = 39%, relative cover of all nonnatives = 73%. 2. Meets verbal description of alliance but not membership rules.
	3	Perennial Rye Grass Field (Sawyer et al. 2009) (<i>Lolium perenne</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>L. multiflorum</i> = 40%, relative cover of all nonnatives = 78%. 2. Meets verbal description of alliance but not membership rules.
	4	Perennial Rye Grass Field (Sawyer et al. 2009) (<i>Lolium perenne</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>L. multiflorum</i> = 19%, relative cover of all nonnatives = 71%. No plant with cover greater than <i>L. multiflorum</i>. 2. Meets verbal description of alliance but not membership rules.
	5	Perennial Rye Grass Field (Sawyer et al. 2009) (<i>Lolium perenne</i> semi-natural herbaceous stand)	<ol style="list-style-type: none"> 1. Relative cover of <i>L. multiflorum</i> = 20%, relative cover of all nonnatives = 81%. No plant with cover greater than <i>L. multiflorum</i>. 2. Meets verbal description of alliance but not membership rules.
	6	Wet Montane Meadow (Holland 1986) or Rush Riparian Grassland (DFG 2003)	<ol style="list-style-type: none"> 1. Relative cover of two highest plants was <i>Mentha pulegium</i> = 20% and <i>Juncus ensifolius</i> = 26%. 2. Data does not meet any membership rules in Sawyer et al. 2009.
	7	Wet Montane Meadow (Holland 1986) or Rush Riparian Grassland (DFG 2003)	<ol style="list-style-type: none"> 1. Relative cover of <i>Mentha pulegium</i> = 19% and perennial <i>Juncus</i> sp. = 35%. 2. Data does not meet any membership rules in Sawyer et al. 2009.

5.1.1 Ford Offsite Mitigation Parcel

5.1.1.1 Cover Types and Species Richness

Two plots were established in the proposed wetland establishment site and three in the adjacent wetlands on the Ford parcel.

For the two plots in the establishment site (1 and 3), vegetation was dominated by nonnative upland annual grasses, with few native or wetland plants. In fact, native wetland species were absent and absolute percent cover of all wetland species was 21% and 35% in the two plots with the main wetland species in both plots being Italian rye grass. Native species richness was low, with only three or four native species present. Yellow star thistle, an invasive plant, was common, with absolute cover of 14% and 16% in the two plots.

The three existing wetland plots (2, 4 and 5) consisted of two wet montane meadow/rush riparian grassland communities (plots 2 and 4) and one hardstem bulrush marsh community (plot 5).

The two sampled wet montane meadow/rush riparian grassland communities contained a diverse mix of native and nonnative wetland and upland plants. Relative percent cover of native wetland species was moderate at 23% and 34%, and absolute percent cover of all wetland species was approximately 100% in each plot. Native species richness was moderate, with seven and nine native species in the two plots. No invasive plants were recorded in either plot.

The hardstem bulrush marsh community was overwhelmingly dominated by hard stem bulrush, a native perennial obligate wetland plant, which was virtually the only plant present and formed 98% of the relative cover in the plot. Native species richness was low, with five native species recorded. No invasive plants were present in the marsh.

5.1.1.2 Plant Community Types Observed

Two sample plots were established within upland grassland proposed for wetland establishment (plots 1 and 3), and three transects were established in adjacent existing wetlands (plots 2, 4, and 5). A map of these plant communities is shown in Figure 2. The upland grasslands were assigned to the annual brome grassland alliance (Sawyer et al. 2009), and were dominated by soft brome, associated with several other nonnative annual grasses; native forbs had very low cover in this plant community.

Two wetland plots could not be identified as any alliance after Sawyer et al. (2009) and were closest to Holland's (1986) wet montane meadow or DFG's (2003) rush riparian grassland. This community type was characterized by higher diversity and a mix of native and nonnative plants, with no clear dominant species. The third wetland plot was overwhelmingly dominated by hard stem bulrush and was assigned to the hardstem bulrush marsh alliance (Sawyer et al. 2009).

5.1.2 Goss/MGC Plasma North Offsite Mitigation Parcels

5.1.2.1 Cover Types and Species Richness

Three plots were sampled in the proposed wetland establishment site (MGC plots 2, 4 and 5), one in a reference site (Goss plot 2), and four plots in adjacent wetlands on the Goss/MGC Plasma North

parcels (MGC plot 1 and 3, and Goss plots 1 and 3). The third plot on the Goss parcel was mowed on the date of the survey (July 26, 2010), so photographs were taken (Attachment 1) and a species list was collected for species richness, but no point counts were taken.

All but one of the sampled plots, both in the establishment site and adjacent existing wetlands, were assigned to the bent grass-tall fescue meadow alliance; the exception was identified as perennial rye grass field alliance. This was located at MGC plot 3 in the existing wetlands. The plots sampled on Goss/MGC Plasma North were relatively similar and were characterized by a relative percent cover of native wetland species ranging from 18% - 35% at MGC Plasma North, slightly lower at Goss at 10%-15%.

Absolute percent cover of all wetland species was 89% to 108%; tall fescue, a nonnative wetland plant, was the dominant species with 26% to 78% absolute cover in the plots. Native species richness was generally moderate, with only 7 to 9 native species present in most plots; the exception was MGC Plasma North plot 4, which had 14 native species, many of them wetland species. No invasive plants were recorded in any of the plots.

5.1.2.2 Plant Community Types Observed

The sampled plant communities on the Goss/MGC Plasma North parcels were perennial grasslands dominated by nonnative grasses. The dominant grasses were tall fescue and Italian ryegrass, and most sampled plots were assigned to the bent grass-tall fescue meadow alliance (Sawyer et al. 2009). This plant community is found in coastal prairie sites where the nonnative grasses have replaced native grasses such as California oatgrass. However, California oatgrass was common in the seven plots, with absolute cover of 5% to 21%. Other wetland native plants were also present, such as sedges and rushes. Overall, however, nonnative plants were dominant, with relative cover ranging from 62% to 82%.

5.1.3 Niesen Offsite Mitigation Parcel

5.1.3.1 Cover Types and Species Richness

Eight plots were established in the proposed Niesen wetland establishment parcel, one in a reference site (plot 6), four in the proposed establishment site (plots 1, 3A, 3B and 5), and three plots in adjacent wetlands (plots 2A, 2B, and 7).

For the four plots in the establishment site, three were assigned to the annual brome grassland alliance and one to the Italian rye grass field alliance. The reference site plot (plot 6) and one of the adjacent wetland plots (plot 7) were assigned to the bent grass-tall fescue alliance, and the remaining two wetland plots (plots 2A and 2B) could not be identified as any alliances after Sawyer et al. (2009) and were matched to wet montane meadow (Holland 1986)/rush riparian grassland (DFG 2003).

The sampled upland annual brome grassland and bent grass-tall fescue meadow plots were characterized by very low relative percent cover of native wetland plants (usually less than 2% cover). Absolute percent cover of all wetland species was more variable, ranging from 23% to 133%; the nonnative tall fescue and Harding grasses were the dominant wetland species. Native species richness varied from 4-11 native species recorded. One invasive species, yellow star thistle, was present in one plot (plot 3B), with absolute cover of 18%.

The characteristics of the wet montane meadow and Italian rye grass field were variable; the proposed wetland establishment site plot 1 (Italian rye grass field) had 35% relative cover of native wetland plants, consisting entirely of toad rush, a small native annual rush. The two wet montane meadow plots had relative cover by native wetland plants of 4% and 69% and absolute wetland plant covers of 61% and 128%. Native species richness varied from 6-12 native species recorded. No invasive plants were recorded in these plots.

5.1.3.2 Plant Community Types Observed

The plant communities sampled on the Niesen parcel were perennial grasslands, most of which were strongly dominated by nonnative plants—in six of the eight plots sampled, relative cover of nonnative plants was 90% or greater. Three of the sampled plots were annual brome grasslands dominated by upland plants, three were nonnative grasslands dominated by grasses with FAC or FACW indicator status, and two could not be matched to any alliance after Sawyer et al. (2009) and were assigned to Holland's (1986) wet montane meadow.

5.1.4 Watson East Offsite Mitigation Parcel

5.1.4.1 Cover Types and Species Richness

Two plots were established in the proposed wetland establishment sites (plots 1 and 5), one in a reference site (plot 7), and four plots in adjacent wetlands on the Watson East parcel (plots 2, 3, 4 and 6).

The two proposed wetland establishment sites, and three of the existing wetland plots were assigned to the perennial rye grass field alliance (Sawyer et al. 2009). The reference site plot (plot 7) and the existing wetland plot east of the north wetland establishment site (plot 6) could not be identified as an alliance after Sawyer et al. (2009) and were matched to wet montane meadow (Holland 1986)/rush riparian grassland (DFG 2003).

The sampled perennial rye grass field plots were relatively homogenous and were characterized by 19% to 29% relative cover of native wetland plants and 67% to 111% absolute cover of all wetland species. Perennial rye grass was the dominant species. Native species richness was generally moderate, with 6 to 8 native species present in all but one plot, in which 16 native species were recorded. The invasive species yellow star thistle was present in the north proposed wetland establishment site (plot 5), with an absolute cover of 1%.

The wet montane meadow plots, including the reference site plot, had higher relative cover of native wetland plants, 52% and 58%, and high absolute cover -- 135% and 123%. Native species richness was high, with 12 and 16 native species present in each plot. No invasive species were recorded in these plots.

5.1.4.2 Plant Community Types Observed

The plant communities sampled on the Watson East parcel were placed in two groups: five plots were assigned to the perennial rye grass field alliance (Sawyer et al. 2009) and the other two most closely matched Holland's (1986) wet montane meadow or DFG's (2003) rush riparian grassland. These two groups of plots were located in different portions of the parcel, perhaps because of the dominant hydrology on the parcel being wetter in the north and drier in the south. The drier

perennial rye grass field plots were located on the southeast portions of the parcel, and the wetter wet montane meadow plots were located in the northeast portion of the parcel, with the exception of the north wetland establishment site which occurs on a high spot amidst surrounding wetter areas.

The perennial rye grass field occurs on seasonally moist to wet sites that are disturbed regularly by cattle grazing. Relative cover of nonnative plants was high, ranging from 71% to 81%. The two wet montane meadow plots were characterized by a high relative cover of native plants (55% and 64%) and a high species richness with no single species dominant; common species included the nonnative pennyroyal and the native spreading rush and sword-leaved rush.

6. Discussion

Caltrans is proposing to establish wetlands on six offsite mitigation parcels: Ford, Goss, MGC Plasma Middle, MGC Plasma North, Niesen, and Watson East. Previously, only target habitat types (e.g., wet meadow and mixed marsh) were identified for each wetland establishment site. Based on the plant community identifications developed as part of the July 2010 vegetation surveys at these proposed wetland establishment sites, the target plant communities can now be identified for each site. Table 4 lists the target habitat and plant community for each wetland establishment site.

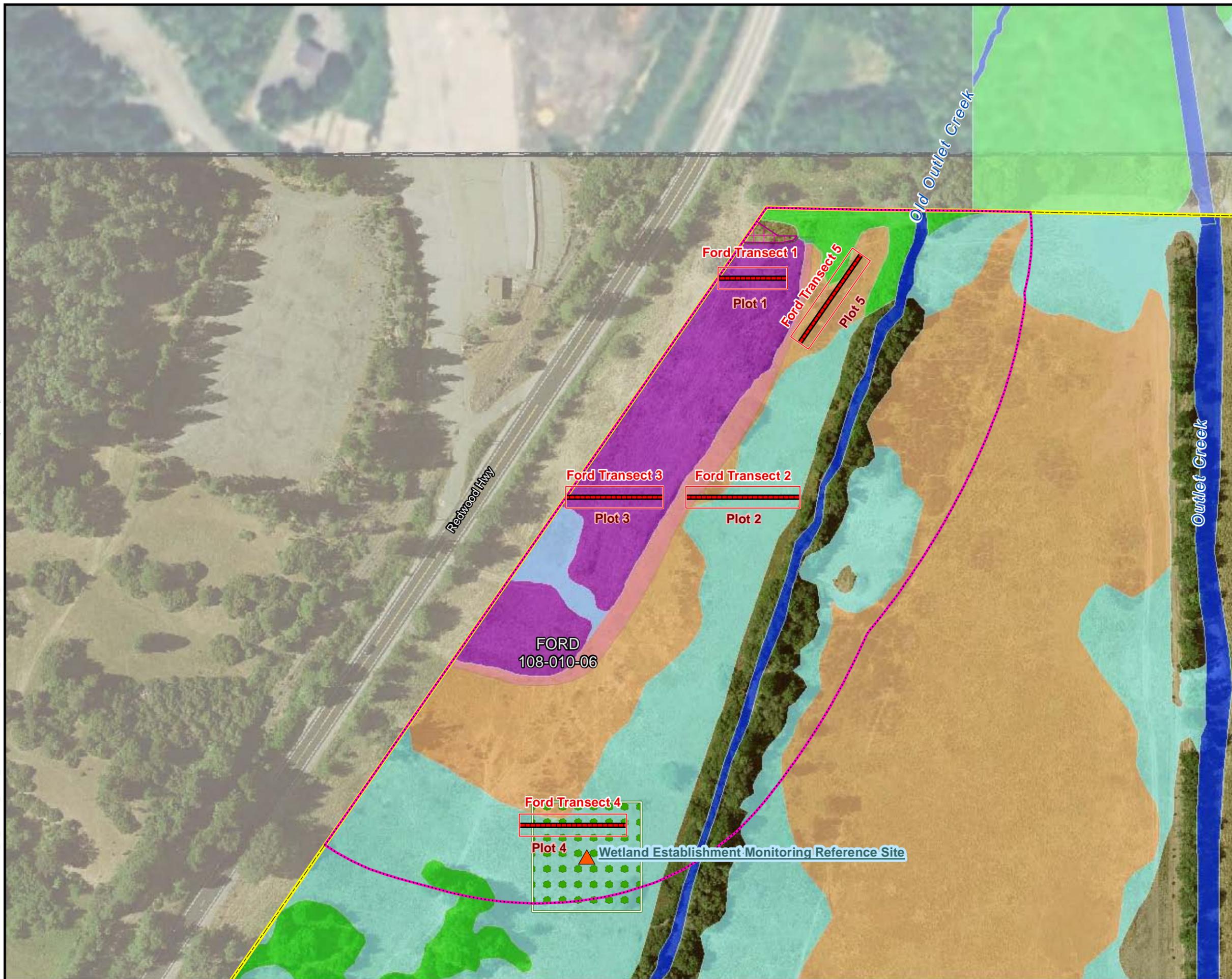
Table 4. Proposed Wetland Establishment Sites at the Offsite Mitigation Parcels

Offsite Mitigation Parcel	Assessor's Parcel Number	Proposed Wetland Establishment Habitat Type	Proposed Wetland Establishment Plant Community
Ford	108-010-06	Mixed marsh and wet meadow	Wet Montane Meadow and Hardstem Bulrush Marsh
Goss/ MGC Plasma Middle/ MGC Plasma North	103-230-02/ 103-250-14/ 103-230-06	Wet meadow	Bent Grass-Tall Fescue Meadow
Niesen	108-040-02	Wet meadow	Wet Montane Meadow
Watson East	037-221-30	Wet meadow	Wet Montane Meadow

7. References

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- Sawyer, J.O., T. Keeler-Wolf, and J. Evens. 2009. A Manual of California Vegetation, Second edition. California Native Plant Society. Sacramento.



- Offsite Mitigation Parcel
- Transects
- Plot Location
- Wetland Establishment - 100m Buffer
- Wetland Establishment Site
- Monitoring Reference Site
- Reference Plots
- Existing Jurisdictional Wetlands**
- Mixed Marsh
- Other Waters
- Riparian Scrub
- Riparian Woodland
- Swale
- Vernal Pool
- Wet Meadow
- Project Bypass Footprint**
- Permanent Impact Area
- Temporary Impact Area
- Right of Way

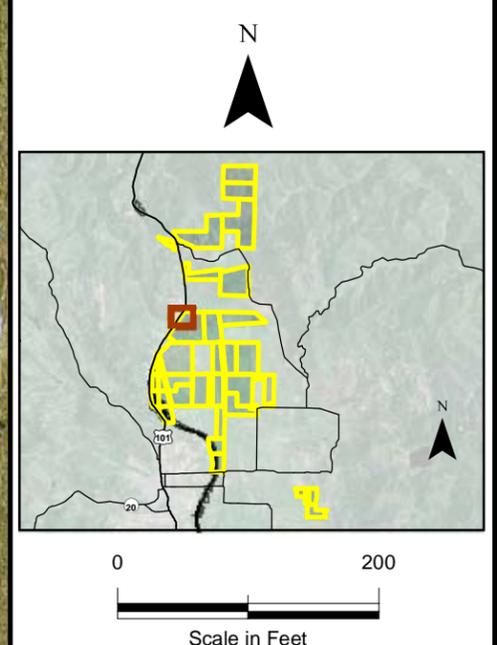
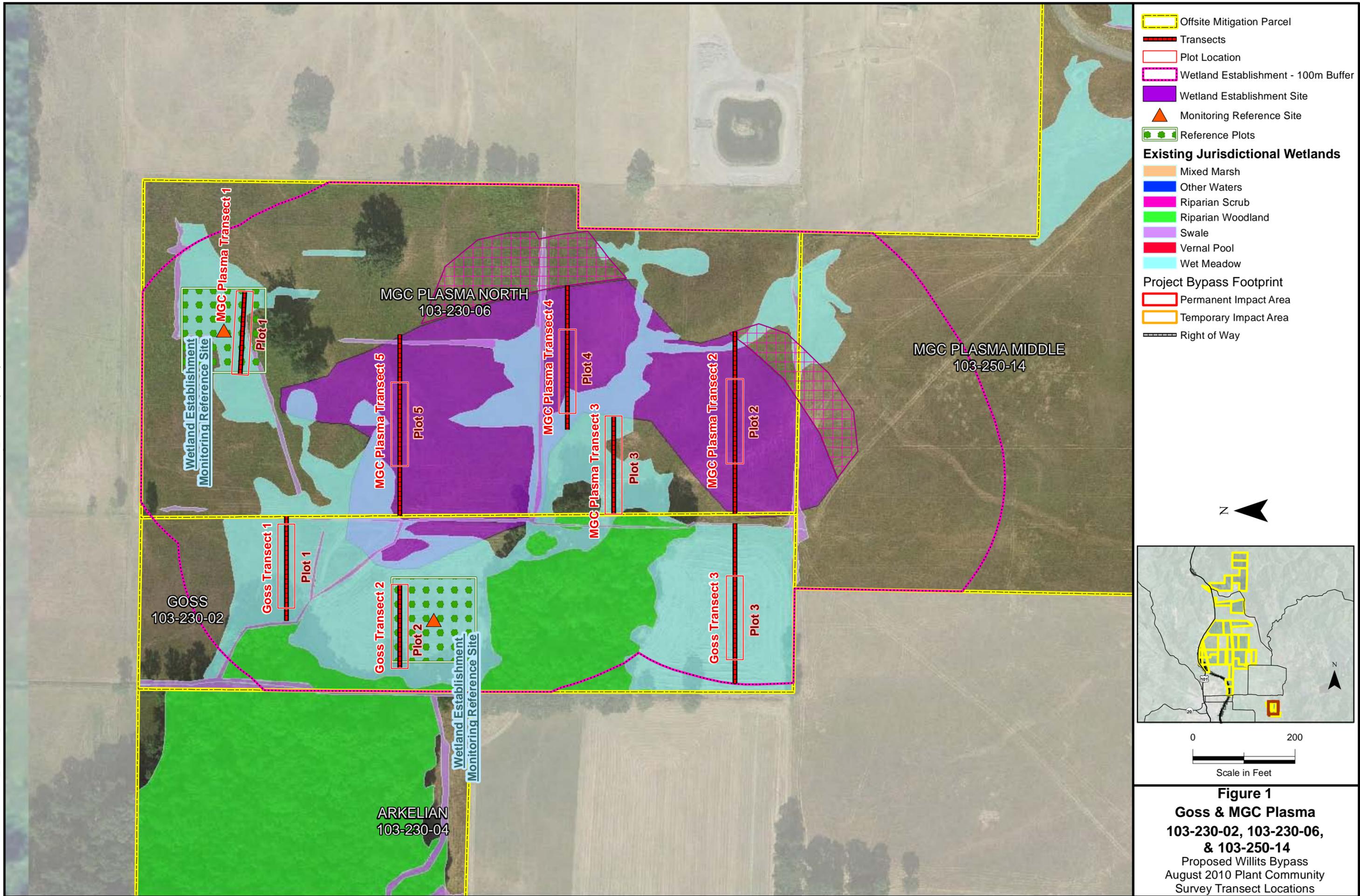


Figure 1
Ford
APN 108-010-06

Proposed Willits Bypass
August 2010 Plant Community
Survey Transect Locations



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- Offsite Mitigation Parcel
 - Transects
 - Plot Location
 - Wetland Establishment - 100m Buffer
 - Wetland Establishment Site
 - Monitoring Reference Site
 - Reference Plots
- Existing Jurisdictional Wetlands**
- Mixed Marsh
 - Other Waters
 - Riparian Scrub
 - Riparian Woodland
 - Swale
 - Vernal Pool
 - Wet Meadow
- Project Bypass Footprint**
- Permanent Impact Area
 - Temporary Impact Area
 - Right of Way

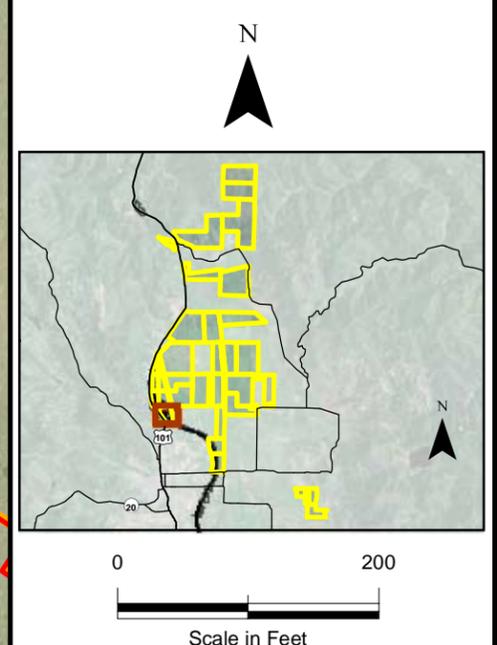
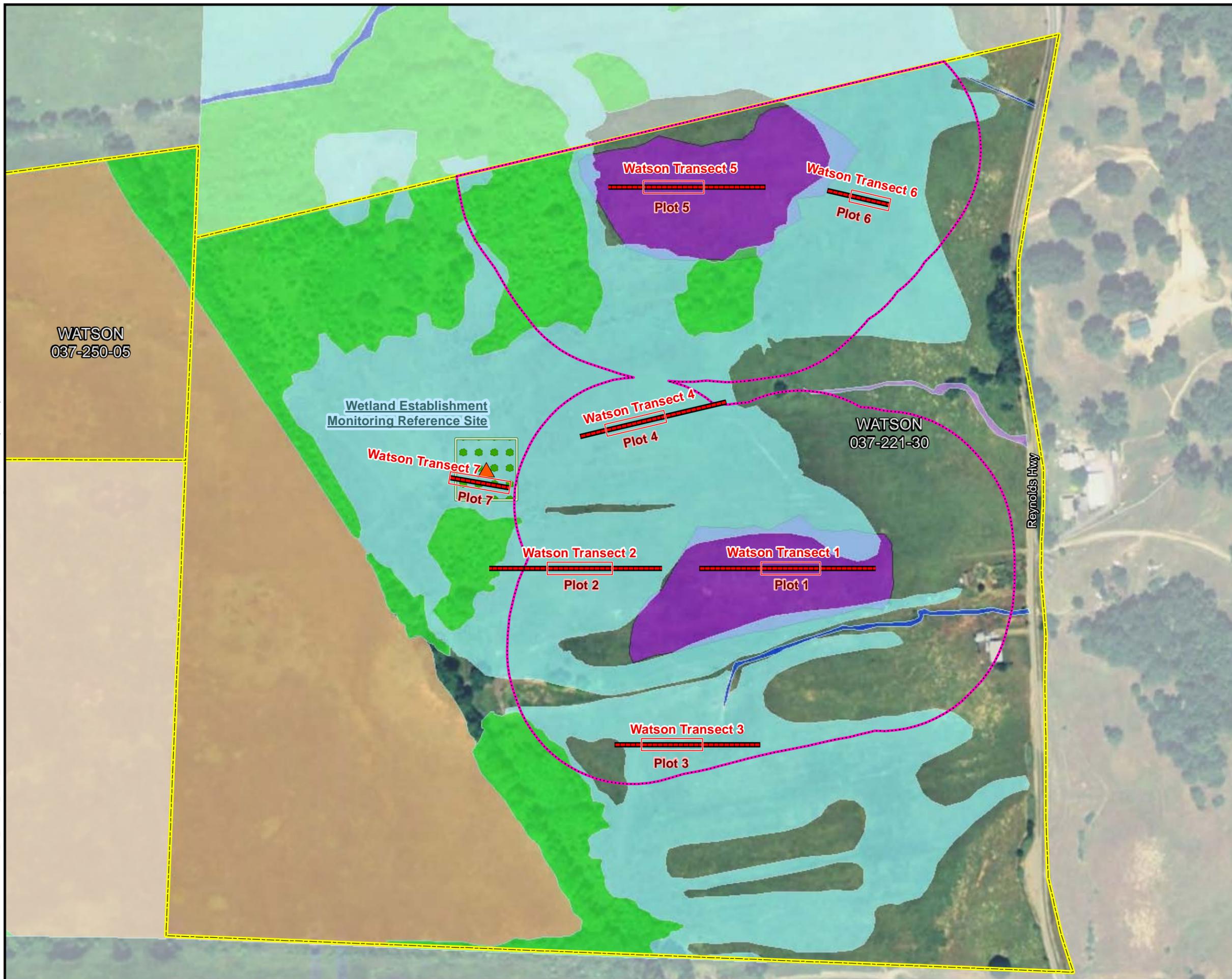


Figure 1
Niesen
APN 108-040-02

Proposed Willits Bypass
 August 2010 Plant Community
 Survey Transect Locations

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- Offsite Mitigation Parcel
 - Transects
 - Plot Location
 - Wetland Establishment - 100m Buffer
 - Wetland Establishment Site
 - Monitoring Reference Site
 - Reference Plots
- Existing Jurisdictional Wetlands**
- Mixed Marsh
 - Other Waters
 - Riparian Scrub
 - Riparian Woodland
 - Swale
 - Vernal Pool
 - Wet Meadow
- Project Bypass Footprint**
- Permanent Impact Area
 - Temporary Impact Area
 - Right of Way

WATSON
037-250-05

Wetland Establishment
Monitoring Reference Site

WATSON
037-221-30

Reynolds Hwy

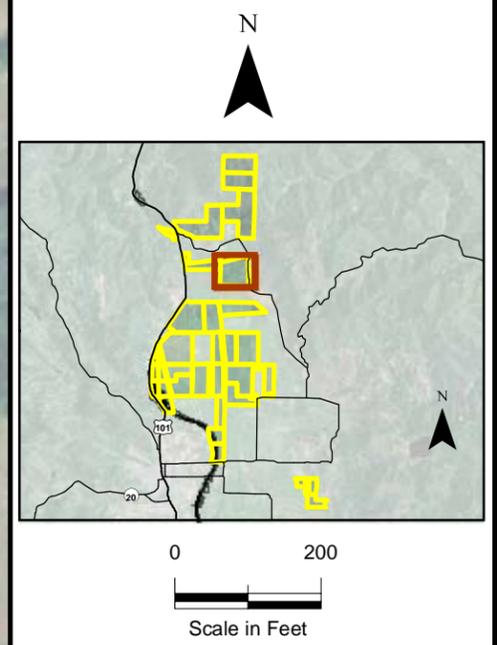
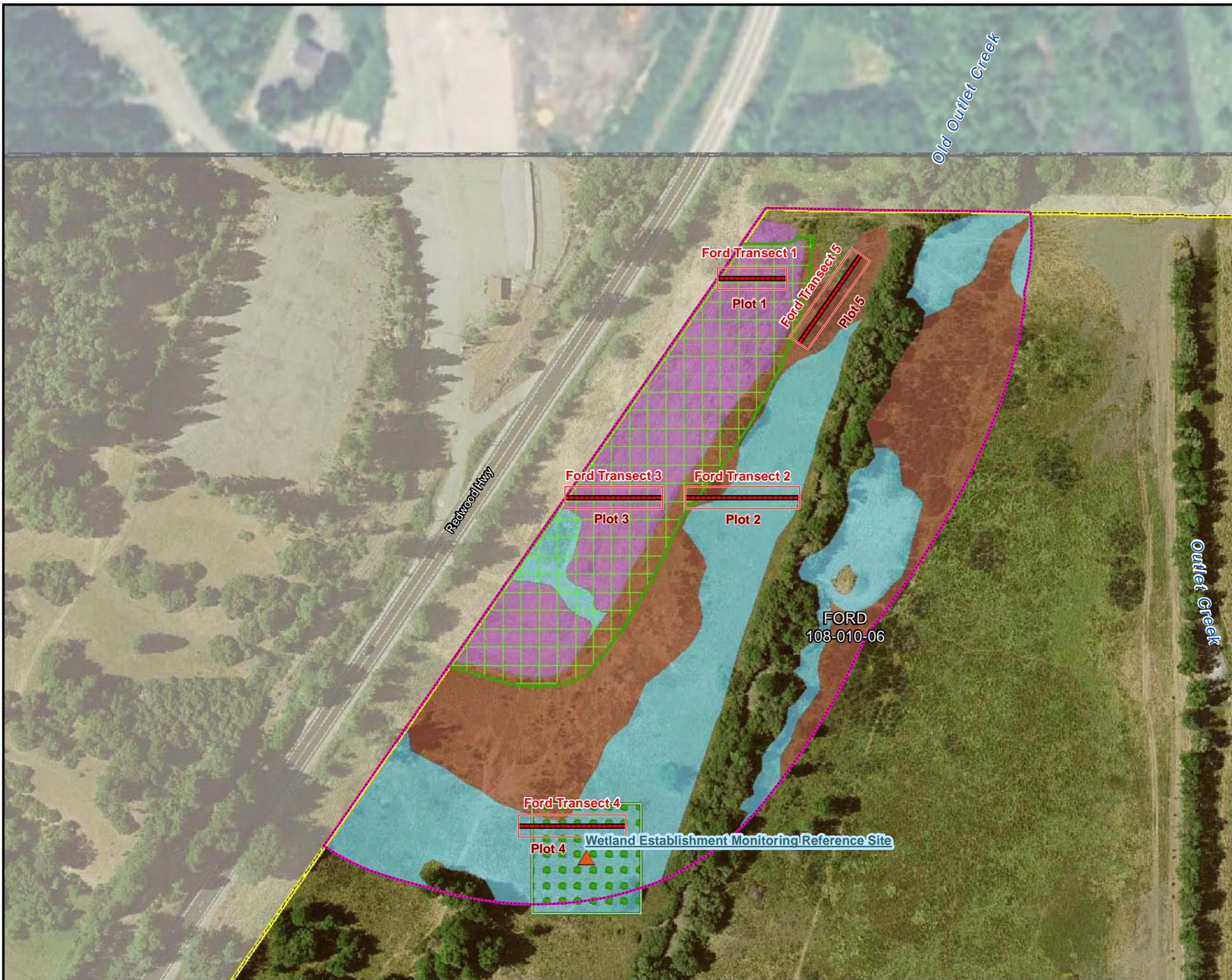


Figure 1
Watson
APN 037-221-30

Proposed Willits Bypass
August 2010 Plant Community
Survey Transect Locations



Legend

- Offsite Mitigation Parcel
- Wetland Establishment Site
- Wetland Establishment - 100m Buffer
- Transects
- Plot Location
- Monitoring Reference Site
- Reference Plots

Vegetation Types

- Annual Brome Grassland
- Bent Grass - Tall Fescue Meadow
- Hardstem Bulrush Marsh
- Italian Ryegrass Grassland
- Perennial Ryegrass Field
- Wet Montane Meadow

Project Bypass Footprint

- Permanent Impact Area
- Temporary Impact Area
- Right of Way

N

0 200

Scale in Feet

Figure 2
Ford
APN 108-010-06

Proposed Willits Bypass
August 2010 Plant Community Map



Legend

- Offsite Mitigation Parcel
- Wetland Establishment Site
- Wetland Establishment - 100m Buffer
- Transects
- Plot Location
- ▲ Monitoring Reference Site
- Reference Plots

Vegetation Types

- Annual Brome Grassland
- Bent Grass - Tall Fescue Meadow
- Hardstem Bulrush Marsh
- Italian Ryegrass Grassland
- Perennial Ryegrass Field
- Wet Montane Meadow

Project Bypass Footprint

- Permanent Impact Area
- Temporary Impact Area
- Right of Way

N

0 200
Scale in Feet

Figure 2
Goss & MGC Plasma
103-230-02, 103-230-06,
& 103-250-14
 Proposed Willits Bypass
 August 2010 Plant Community Map

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- Offsite Mitigation Parcel
 - Wetland Establishment Site
 - Wetland Establishment - 100m Buffer
 - Transects
 - Plot Location
 - ▲ Monitoring Reference Site
 - Reference Plots
- Vegetation Types**
- Annual Brome Grassland
 - Bent Grass - Tall Fescue Meadow
 - Hardstem Bulrush Marsh
 - Italian Ryegrass Grassland
 - Perennial Ryegrass Field
 - Wet Montane Meadow
- Project Bypass Footprint**
- Permanent Impact Area
 - Temporary Impact Area
 - Right of Way

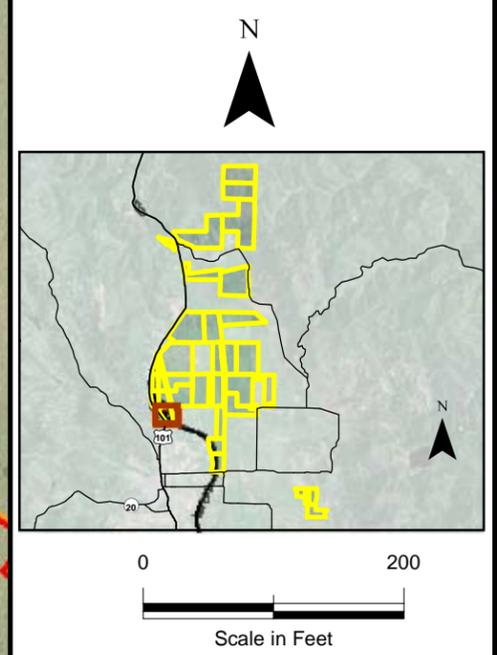


Figure 2
Niesen
APN 108-040-02

Proposed Willits Bypass
 August 2010 Plant Community Map



- Offsite Mitigation Parcel
 - Wetland Establishment Site
 - Wetland Establishment - 100m Buffer
 - Transects
 - Plot Location
 - ▲ Monitoring Reference Site
 - Reference Plots
- Vegetation Types**
- Annual Brome Grassland
 - Bent Grass - Tall Fescue Meadow
 - Hardstem Bulrush Marsh
 - Italian Ryegrass Grassland
 - Perennial Ryegrass Field
 - Wet Montane Meadow
- Project Bypass Footprint**
- Permanent Impact Area
 - Temporary Impact Area
 - Right of Way

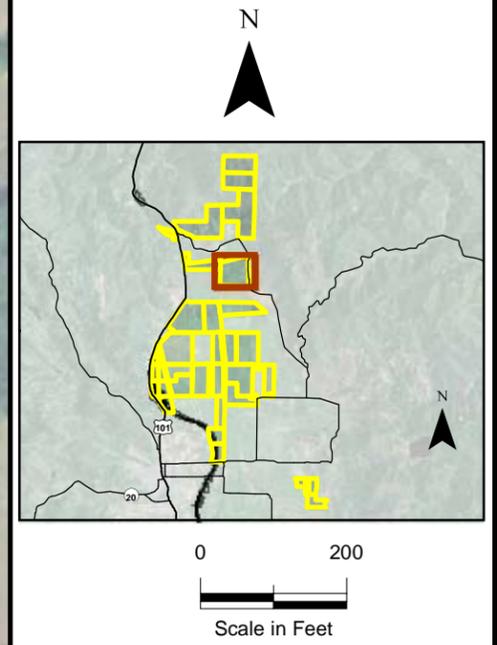


Figure 2
Watson
APN 037-221-30

Proposed Willits Bypass
August 2010 Plant Community Map



Ford Plot 1 – West 248°



Ford Plot 1 – East 72°



Ford Plot 2 – East 70°



Ford Plot 2 – West 250°



Ford Plot 3 – East 70°



Ford Plot 3 – West 250°



Ford Plot 4 – East 70°



Ford Plot 4 – West 250°



Ford Plot 5 – North 20°



Ford Plot 5 – South 200°



Goss Plot 1 – West 250°



Goss Plot 1 – East 70°



Goss Plot 2 – West 250°



Goss Plot 2 – East 70°



Goss Plot 3 – West 250°



Goss Plot 3 – East 70°



MCG Plasma North Plot1 – East 70°



MGC Plasma North Plot 1 – West 250°



MGC Plasma North Plot 2 – West 250°



MGC Plasma North Plot 2 – East 70°



MGC Plasma North Plot 3 – West 250°



MGC Plasma North Plot 3 – East 70°



MGC Plasma North Plot 4 – East 70°



MGC Plasma North Plot 4 – West 250°



MGC Plasma North Plot 5 – West 250°



MGC Plasma North Plot 5 – East 70°



Niesen Plot 1 – Northeast 50°



Niesen Plot 2a – East 80°



Niesen Plot 2b – East 75°



Niesen Plot 3a – Northeast 40°



Niesen Plot 3b – East 70°



Niesen Plot 3b – West 250°



Niesen Plot 5 – West 315°



Niesen Plot 5 – Southeast 135°



Niesen Plot 6 – East 70°



Niesen Plot 6 – West 250°



Niesen Plot 7 – East 70°



Niesen Plot 7 – West 250°



Watson Plot 1 – West 260°



Watson Plot 1 – East 80°



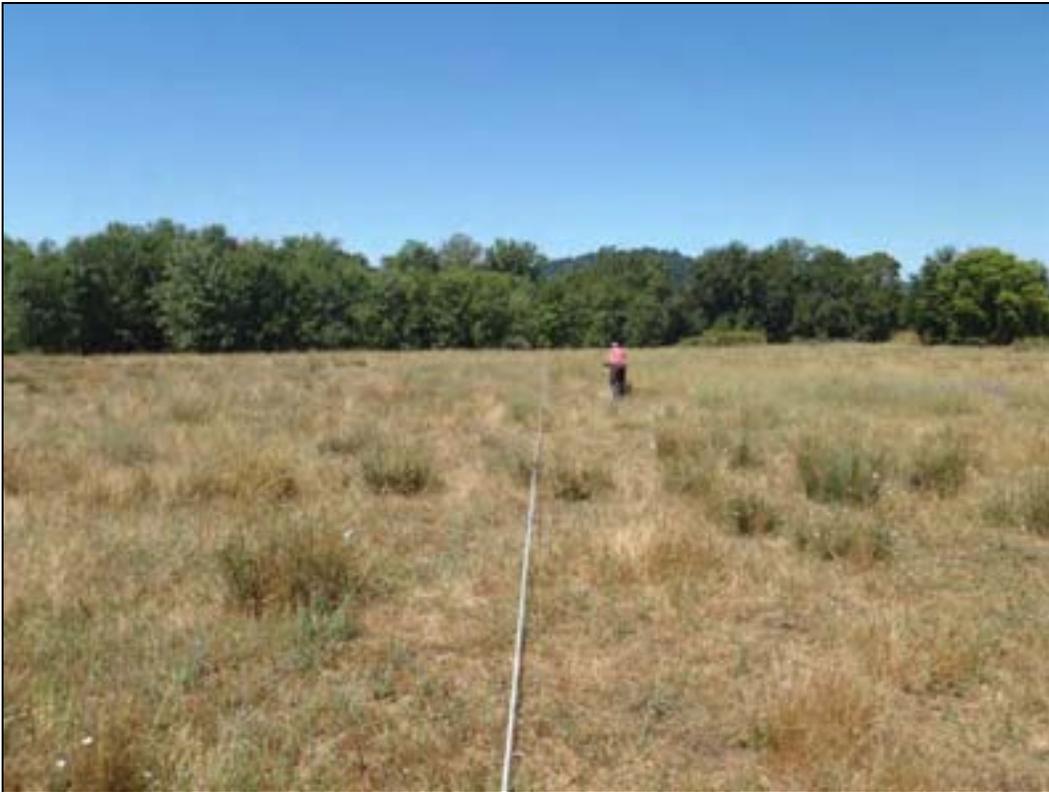
Watson Plot 2 – West 250°



Watson Plot 2 – East 70°



Watson Plot 3 – East 65°



Watson Plot 3 – West 245°



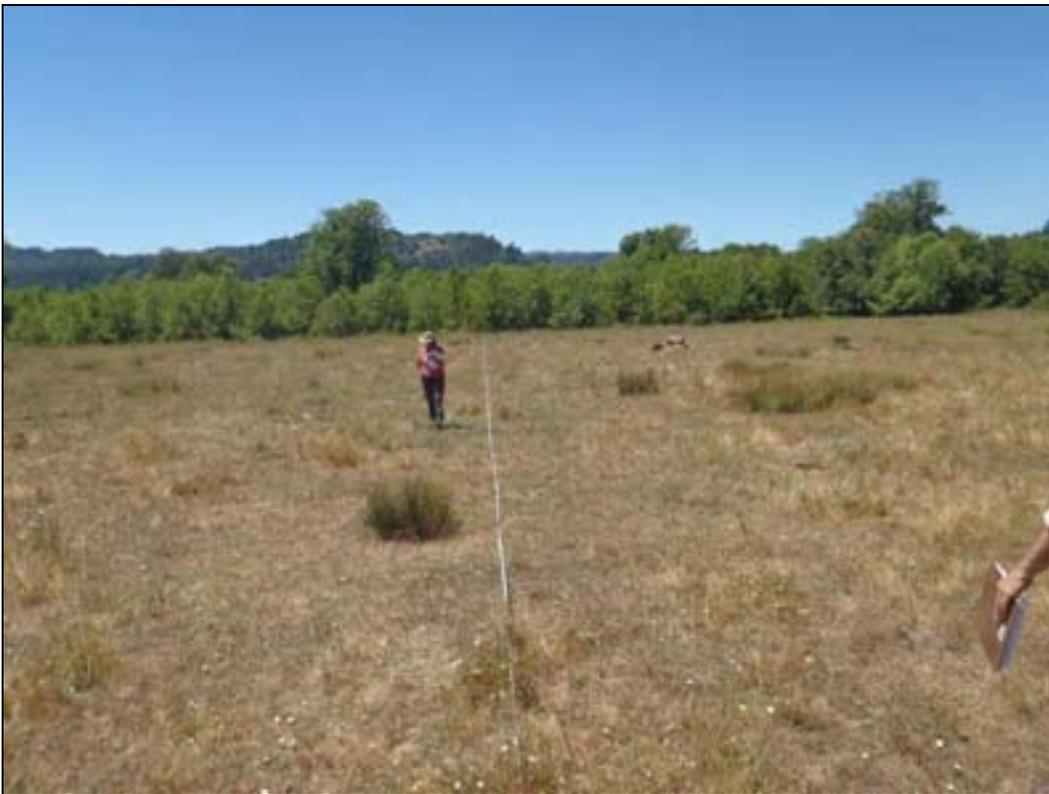
Watson Plot 4 – East 65°



Watson Plot 4 – West 245°



Watson Plot 5 – East 70°



Watson Plot 5 – West 250°



Watson Plot 6 – East 90°



Watson Plot 6 – West 270°



Watson Plot 7 – East 70°



Watson Plot 7 – West 250°

Species	Native/ Introduced ¹	Invasive (Y/N) ²	Wetland Indicator Status ³	Ford					Goss			Niesen							MGC Plasma North					Watson								
				T1	T2	T3	T4	T5	T1	T2	T3	T1	T2a	T2b	T3a	T3b	T5	T6	T7	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T6	T7	
<i>Navarretia squarrosa</i>	N	N	UPL									1				1																
<i>Parentucellia viscosa</i>	I	N	NI*	1									1	1		1		1	1	1					1	1	1	1	1	1	1	1
<i>Polypogon monspeliensis</i>	I	N	FACW+																						1							
<i>Perideridia kelloggii</i>	N	N	UPL																							1					1	
<i>Perideridia pringlei</i>	N	N	UPL																											1		
<i>Phalaris aquatica</i>	I	N	FAC+						1	1	1				1		1	1	1		1				1	1	1	1		1	1	1
<i>Phleum pratense</i>	I	N	FACU		1	1	1				1							1	1	1	1	1	1			1		1		1	1	
<i>Plantago lanceolata</i>	I	N	FAC-						1						1	1		1			1		1	1				1	1			
<i>Plantago major</i>	I	N	FACW-									1																				
<i>Pleuropogon hooverianus</i>	N	N	FACW								1																					
<i>Poa annua</i>	I	N	FACW-									1												1	1				1	1		
<i>Poa pratensis (ssp. pratensis)</i>	I	N	FACU		1		1				1	1	1	1	1		1	1	1	1	1					1	1	1		1	1	
<i>Polygonum arenastrum</i>	I	N	UPL									1												1								
<i>Polygonum sp.</i>	N	N	>FAC																											1		
<i>Polypogon monspeliensis</i>	I	N	FACW+																					1								
<i>Quercus lobata</i>	N	N	FAC*												1	1																
<i>Ranunculus sp. (leaves only)</i>	N	N	undetermined										1							1							1		1	1		
<i>Rosa californica</i>	N	N	FAC+								1																					
<i>Rubus discolor (R. armeniacus)</i>	I	N	FACW*								1				1																	
<i>Rumex acetosella</i>	I	N	UPL	1		1									1	1	1			1		1										
<i>Rumex conglomeratus</i>	I	N	FACW		1		1						1												1	1	1	1	1	1	1	
<i>Rumex crispus</i>	I	N	FACW-	1	1	1	1				1		1	1	1	1	1	1	1		1	1			1	1	1		1	1		
<i>Rumex pulcher</i>	I	N	FAC+									1	1										1	1								
<i>Scirpus acutus var. occidentalis</i>	N	N	OBL		1			1																								
<i>Sonchus asper</i>	I	N	FAC												1							1										
<i>Sonchus oleraceus</i>	I	N	NI*															1														
<i>Spergularia rubra</i>	I	N	FAC-												1																	
<i>Spergularia sp.</i>	N	N	assume FAC									1		1																		
<i>Spiranthes romanzoffiana (S. diluvialis)</i>	N	N	OBL										1																			
<i>Stachys sp.</i>	N	N	undetermined				1						1													1						
<i>Taeniatherum caput-medusae</i>	I	N	UPL								1																					
<i>Torilis arvensis</i>	I	N	UPL								1				1																	
<i>Toxicodendron diversilobum</i>	N	N	UPL								1																					
<i>Trifolium dubium</i>	I	N	FACU*			1			1				1			1	1	1	1		1					1						
<i>Trifolium fragiferum</i>	I	N	NI*		1							1		1												1						
<i>Trifolium glomeratum</i>	I	N	UPL												1																	
<i>Trifolium hirtum</i>	I	N	UPL												1																	
<i>Trifolium repens</i>	I	N	FACU+		1		1				1						1													1		
<i>Trifolium sp.</i>	I	N	UPL	1		1																										
<i>Trifolium subterraneum</i>	I	N	UPL											1	1		1									1						
<i>Trifolium variegatum</i>	N	N	FACW-																							1				1		
<i>Verbascum blattaria</i>	I	N	FACW																				1									

