Chapter 7 Mitigation Work Plan

This chapter describes the MMP mitigation work plan and its implementation. The chapter provides information pertaining to the mitigation strategies for the onsite and offsite mitigation areas, the general mitigation implementation techniques, and specific information related to mitigation techniques for the onsite and offsite mitigation areas.

The mitigation work plan covers both onsite and offsite mitigation efforts. Caltrans will implement and manage mitigation at the onsite mitigation area. Caltrans will implement mitigation at the offsite mitigation parcels and MCRCD will manage mitigation at the offsite mitigation parcels.

7.1 Mitigation Strategy

Mitigation for project construction impacts will occur at onsite and offsite mitigation areas. A general summary of the mitigation strategies by resource and impact category is provided in Table 7-1.

Bypass construction will result in temporary and permanent impacts on two State-listed plant species—NCSG and BM. Temporary and permanent impacts on these species will be mitigated offsite through rehabilitation. In addition to rehabilitation, and as part of impact minimization efforts for these species, permanently affected observed populations of NCSG and BM will be salvaged from the bypass project footprint. BM will be salvaged as plant duff and topsoil that will be reapplied to the Watson East offsite mitigation parcel as part of wetland establishment efforts on the parcel. NCSG will be salvaged as seed and plant material. The seed will be collected for conservation at a germplasm repository, propagation by a native plant nursery for planting in the transplantation locations, and direct sowing at the transplantation locations; the plant material will be transplanted from locations that are in the direct path of construction to adjacent locations outside the direct path of construction and protected by environmentally sensitive area (ESA) fencing during project construction activities.

Bypass construction also will result in temporary and permanent impacts on riparian, wetland and other waters, and oak woodland habitat. Temporary and permanent impacts on riparian wetland habitat will be mitigated through onsite reestablishment (Appendix D), offsite establishment and rehabilitation (Appendices C, E, and F), and offsite preservation (Appendix C).

Temporary and permanent impacts on other waters will be mitigated through riparian reestablishment onsite and rehabilitation on the offsite mitigation parcels (Appendices C, E, and F), stream fish passage improvements at Haehl and Upp Creeks in the bypass project footprint (Appendix F), financial contribution to development of the Ryan Creek culvert project outside the bypass project footprint and Little Lake Valley (Chapters 3 and 6), and protection. Permanent impacts on oak woodland will be mitigated through establishment, and preservation, at the offsite mitigation parcels.

Wetland mitigation construction at the offsite mitigation parcels is planned to occur in areas near or adjacent to existing wetlands and will result in temporary impacts on wetlands. Temporary impacts on offsite wetland mitigation parcels will be mitigated through reestablishment as part of wetland establishment. The reestablished acres will not be credited toward mitigating project impacts.

Many mitigation actions are planned to occur in areas near or adjacent to drainages and streams but not within the stream channel (i.e., channel bed and bank slopes). For example, where riparian planting is proposed as part of establishment and rehabilitation, the work will be at the top of streambanks and will not occur within the stream channel. The exception is riparian rehabilitation at the Ford offsite mitigation parcel (APN 108-010-06), where three segments of eroding banks will be repaired to address bank erosion and reduce sedimentation directly into adjacent Outlet Creek. These segments total approximately 470 linear feet and overall do not represent a large-scale mitigation action. Because instream work is limited, mitigation actions will not affect the present equilibrium of stream channels at the offsite mitigation parcels, although locally at the Ford offsite mitigation parcel excessive sediment from the three eroding bank segments will be reduced.

A general summary of the mitigation strategies by resource and impact category is provided in Table 7-1.

Table 7-1. Summary of Mitigation Strategies

Resource	Impact Category	Mitigation Strategy
North Coast semaphore grass	Temporary	Onsite minimization and reestablishment
	Permanent	Onsite minimization
		Offsite establishment and rehabilitation
Baker's meadowfoam	Temporary	Onsite minimization and reestablishment
		Offsite rehabilitation
	Permanent	Onsite minimization
		Offsite rehabilitation
Riparian habitat (Categories I, II, and III Riparian Corridors)	Temporary	Onsite reestablishment
		Offsite establishment and rehabilitation
	Permanent	Offsite establishment and rehabilitation
Wetland habitat	Temporary	Onsite reestablishment (for project construction impacts)
		Offsite establishment (for wetland mitigation construction impacts)
		Offsite establishment, rehabilitation, and preservation.
	Permanent	Offsite reestablishment (for wetland mitigation impacts), establishment (for project construction impacts), rehabilitation and preservation (for project construction impacts)
Other waters	Temporary	Onsite reestablishment
		Onsite fish passage improvements at Haehl and Upp Creeks and financial contribution to development of the Ryan Creek culvert project
		Offsite establishment and rehabilitation (riparian habitat)
	Permanent	Onsite fish passage improvements at Haehl and Upp Creeks and financial contribution to development of the Ryan Creek culvert project
		Offsite establishment (riparian habitat), rehabilitation and preservation
Oak woodland habitat	Permanent	Offsite establishment and preservation

For the purpose of this document, *mitigation unit* is defined as a specific geographic area in which a particular mitigation action will occur. Mitigation units occur in the onsite and offsite mitigation areas.

The term "mitigation unit" refers to an area that has been separated from other areas with an administrative boundary for management and accounting purposes. For onsite reestablishment areas, each individual geographic polygon will be assessed separately. For offsite mitigation parcels one or more mitigation units may occur on a given parcel. A mitigation unit will only have one wetland rehabilitation type taking place within its boundaries. A single mitigation unit can span multiple parcels, but in most cases units are confined to one parcel. Most mitigation units are one contiguous area; however there are a few cases where a mitigation unit may have more than one area assigned to it. In all cases areas composing a particular mitigation unit always have the same wetland rehabilitation type. For example, on Ford 108-020-04, three mitigation units would exist.

All three are contained within the boundary of parcel 108-020-04 and each one is a contiguous area of land. Only one wetland rehabilitation type is proposed in any one mitigation unit. Another example, MCG Plasma Middle 103-250-14, shows a single mitigation unit composed of 2 noncontiguous areas. Both are designated as type 4 wetland rehabilitation areas, which illustrates again that only one wetland rehabilitation type is assigned to a particular mitigation unit. Riparian establishment mitigation on the west side of Outlet Creek which span Ford parcels 108-020-04 and 108-030-02 is an example of a contiguous unit that spans multiple parcels.

Table 7-2 summarizes habitat establishment, rehabilitation, and preservation at the offsite mitigation parcels. Appendices C–F show the establishment, reestablishment, and rehabilitation areas.

Table 7-2. Mitigation Establishment and Rehabilitation Actions for the Offsite Mitigation Parcels

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
Arkelian	103-230-04	Section 7.3.2.1; Appendix C	North Coast Semaphore Grass Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve North Coast semaphore grass populations							X
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate riparian wetland and wet meadow							X
Benbow	108-020-06	Section 7.3.2.2; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Establishment		X			X						Establish Group 2 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
Benbow	108-030-07	Section 7.3.2.3; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 3 wetland rehabilitation				X	X	X	X
Benbow	108-040-13	Section 7.3.2.4; Appendix C	Wetland Establishment		X			X						Establish Group 2 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 3 wetland rehabilitation				X	X	X	X

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
Benbow (continued)	108-040-13 (continued)	Section 7.3.2.4; Appendix C	Riparian Rehabilitation		X				X					Enhance existing riparian vegetation adjacent to unnamed creek (a Category III Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation										X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
				X								X	X	Repair headcut in unnamed creek	X	X					
Benbow	007-010-04	Section 7.3.2.5; Appendix C	Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X					X	X	Implement Type 2 wetland rehabilitation and Type 3				X	X	X	X
			Riparian Rehabilitation		X				X					Enhance existing riparian vegetation adjacent to Baechtel Creek (a Category I Riparian Corridor) and an unnamed creek (a Category III Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing and remove grazing infrastructure			X	X			
			Other Waters Rehabilitation										X	Discontinue grazing and remove grazing infrastructure			X	X			
Benbow	007-020-03	Section 7.3.2.6; Appendix C	Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X					X	X	Implement Type 2 wetland rehabilitation and Type 3				X	X	X	X
			Riparian Rehabilitation		X				X					Enhance existing riparian vegetation adjacent to Baechtel Creek (a Category I Riparian Corridor) and an unnamed creek (a Category III Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing and remove grazing infrastructure			X	X			
			Other Waters Rehabilitation										X	Discontinue grazing and remove grazing infrastructure			X	X			
Brooke	108-020-03	Section 7.3.2.7; Appendix C	Oak Woodland Establishment				X						X	Remove teasel, poison hemlock, and other invasive plant species							
					X	X				X			X	Plant native oaks and shrub species				X	X		X

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Mill Creek (a Category I Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Mill Creek (a Category I Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
			Other Waters Rehabilitation			X		X	X				X	Plant native riparian species in unvegetated areas along Mill Creek (a Category I Riparian Corridor)		X	X	X	X	X	
Brooke	038-020-11	Section 7.3.2.8; Appendix C	Oak Woodland Establishment				X						X	Remove teasel, poison hemlock, and other invasive plant species							
					X	X				X			X	Plant native oaks and shrub species				X	X		X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Mill Creek (a Category I Riparian Corridor)		X	X	X	X	X	
Brooke	038-040-09	Section 7.3.2.9; Appendix C	Oak Woodland Establishment				X						X	Remove teasel, poison hemlock, and other invasive plant species							
					X	X				X			X	Plant native oaks and shrub species				X	X		X
Brooke	108-030-01	Section 7.3.2.10; Appendix C	Oak Woodland Establishment				X						X	Remove teasel, poison hemlock, and other invasive plant species							
					X	X				X			X	Plant native oaks and shrub species				X	X		X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Mill Creek (a Category I Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Mill and Upp Creeks (Category I Riparian Corridors) by widening the riparian corridor and planting additional vegetation				X	X	X	
			Other Waters Rehabilitation			X		X	X				X	Plant native riparian species in unvegetated areas along Mill Creek (a Category I Riparian Corridor). Rehabilitation benefits extend along Upp Creek as well.		X	X	X	X	X	
Ford	108-010-06	Section: 7.3.2.11, Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Establishment		X			X						Establish Group 1 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)			X	X	X				X	X	Implement Type 5 wetland rehabilitation along portions of Outlet Creek		X	X	X	X	X	

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Outlet and Old Outlet Creeks (Category I Riparian Corridors) and Wild Oat Canyon Creek (Category II Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Outlet and Old Outlet Creeks (Category I Riparian Corridors) and Wild Oat Canyon Creek (Category II Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Plant native riparian species in unvegetated areas along Outlet Creek and Old Outlet Creek (Category I Riparian Corridors) and Wild Oat Creek (Category II Riparian Corridor)		X	X	X	X	X	
				X		X			X				X	Implement bank erosion rehabilitation at three locations on Outlet Creek		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
Ford	108-020-04	Section 7.3.2.12; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Establishment		X			X						Establish Group 2 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 3 and Type 4 wetland rehabilitation				X	X	X	X
						X	X	X				X	X	Implement Type 5 wetland rehabilitation along portions of Outlet Creek		X	X	X	X	X	
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Outlet and Old Outlet Creeks (Category I Riparian Corridors)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Outlet and Old Outlet Creeks (Category I Riparian Corridors) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
			Other Waters Rehabilitation			X		X	X				X	Plant native riparian species in unvegetated areas along Outlet Creek and Old Outlet Creek (Category I Riparian Corridors)		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
Ford	108-030-02	Section 7.3.2.13; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Establishment		X			X						Establish Group 2 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 3 and Type 4 wetland rehabilitation				X	X	X	X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Outlet and Old Outlet Creeks (Category I Riparian Corridors)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Outlet and Old Outlet Creeks (Category I Riparian Corridors) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Plant native riparian species in unvegetated areas along Outlet Creek and Old Outlet Creek (Category I Riparian Corridors)		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
Ford	108-010-05	Section 7.3.2.14; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 5 wetland rehabilitation along portions of Davis Creek		X	X	X	X	X	
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Davis Creek (Category I Riparian Corridor)		X	X	X	X	X	

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Davis Creek (Category I Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Rehabilitate Davis Creek (Category I Riparian Corridor) by planting native riparian species		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
Ford	108-030-05	Section 7.3.2.15; Appendix C	Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure from entire parcel			X	X			
						X	X	X				X	X	Implement Type 3 wetland rehabilitation				X	X	X	X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Outlet Creek (Category I Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Outlet Creek (Category I Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Rehabilitate Outlet Creek (Category I Riparian Corridor) by planting native riparian species		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
Frost	108-070-04	Section 7.3.2.16; Appendix C	North Coast Semaphore Grass Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve North Coast semaphore grass populations							X
			Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Other Waters Rehabilitation	X		X		X	X				X	Implementation drainage restoration actions on an unnamed drainage that flows to Berry Creek		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
Goss	103-230-02	Section 7.3.2.17; Appendix C	North Coast Semaphore Grass Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve North Coast semaphore grass populations							X
			Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Establishment		X			X						Establish Group 1 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
Huff	037-240-RW	Section 7.3.2.18; Appendix C	Wetland and Other Waters Preservation									X	X	Implement exclusion fencing or other methods to prohibit unauthorized access							
Huffman	108-040-08	Section 7.3.2.19; Appendix C	North Coast Semaphore Grass Establishment				X				X		X	Implement grazing management plan to maintain or improve North Coast semaphore grass populations							X
								X			X		X	Transplant North Coast semaphore grass rhizomes and install container plants							X
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
Lusher	108-030-03	Section 7.3.2.20; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Mill Creek and Upp Creek (Category I Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Mill Creek and Upp Creek (Category I Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Plant native riparian species in unvegetated areas along Mill Creek and Upp Creek (Category I Riparian Corridor)		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
Lusher	038-060-08	Section 7.3.2.21; Appendix C	Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 3 wetland rehabilitation				X	X	X	X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Upp Creek (Category I Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Upp Creek (Category I Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Plant native riparian species in unvegetated areas along Upp Creek (Category I Riparian Corridor)		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
Lusher	108-030-04	Section 7.3.2.22; Appendix C	North Coast Semaphore Grass Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve North Coast semaphore grass populations							X
			Wetland Establishment		X			X						Establish Group 2 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 3 wetland rehabilitation				X	X	X	X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Outlet Creek, Old Outlet Creek, and Mill Creek (Category I Riparian Corridors)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Outlet Creek, Old Outlet Creek, and Mill Creek (Category I Riparian Corridors) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Rehabilitate Outlet Creek, Old Outlet Creek, and Mill Creek (Category I Riparian Corridors) by planting native riparian species		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
				X				X				X	X	Repair headcuts adjacent to Old Outlet Creek	X	X					

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
MGC Plasma North	103-230-06	Section 7.3.2.23; Appendix C	North Coast Semaphore Grass Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve habitat for North Coast semaphore grass populations							X
			Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Establishment		X			X						Establish Group 1 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
MGC Plasma Middle	103-250-14	Section 7.3.2.24; Appendix C	Wetland Establishment		X			X						Establish Group 1 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 4 wetland rehabilitation				X	X	X	X
Nance	108-050-06	Section 7.3.2.25; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 5 wetland rehabilitation along portions of Berry Creek		X	X	X	X	X	
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Berry Creek (Category I Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Berry Creek (Category I Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Rehabilitate Davis Creek, a Category I Riparian Corridor, by planting native riparian species		X	X	X	X	X	
													X	Discontinue grazing and install exclusion fencing along the riparian corridor			X	X			

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
Niesen	108-040-02	Section 7.3.2.26; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Establishment		X			X						Establish Group 1 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 4 wetland rehabilitation				X	X	X	X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Mill Creek (Category I Riparian Corridor) and an unnamed tributary (Category II Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Mill Creek (Category I Riparian Corridor) and an unnamed tributary (Category II Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
Taylor	037-210-16	Section 7.3.2.27; Appendix C	Oak Woodland Preservation										X	Maintain a conservation easement and implement a grazing management plan							
			Oak Woodland Grassland Preservation										X	Maintain a conservation easement and implement a grazing management plan							
Taylor	037-210-65	Section 7.3.2.27; Appendix C	Oak Woodland Preservation										X	Maintain a conservation easement and implement a grazing management plan							
			Oak Woodland Grassland Preservation										X	Maintain a conservation easement and implement a grazing management plan							
Watson	037-250-05	Section 7.3.2.28; Appendix C	Wetland Rehabilitation (Ungrazed)			X	X					X	X	Implement Type 1 wetland rehabilitation				X	X	X	X
Watson	037-221-30	Section 7.3.1.29; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Establishment		X			X						Establish Group 1 and Group 2 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
Watson (continued)	037-221-30 (continued)	Section 7.3.1.29; Appendix C	Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X					X	X	Implement Type 1 wetland rehabilitation				X	X	X	X
						X	X	X				X	X	Implement Type 3 wetland rehabilitation				X	X	X	X
			Oak Woodland Establishment										X	Discontinue grazing during plant establishment and install temporary exclusion fencing			X	X	X		X
					X	X				X			X	Plant native oaks and shrub species				X	X		X
Wildlands	108-060-01	Section 7.3.2.30; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam population							X
			Wetland Establishment		X			X						Establish Group 2 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure							
						X	X	X				X	X	Implement Type 4 wetland rehabilitation				X	X	X	X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Davis Creek (Category I Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Davis Creek (Category I Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Rehabilitate Davis Creek (Category I Riparian Corridor) by planting native riparian species		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
Wildlands	108-020-07	Section 7.3.2.31; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X`
			Wetland Establishment		X			X						Establish Group 2 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Davis Creek (Category I Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Davis Creek (Category I Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Rehabilitate Davis Creek (Category I Riparian Corridor) by planting native riparian species		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
Wildlands	108-060-02	Section 7.3.2.32; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 5 wetland rehabilitation along portions of Berry Creek		X	X	X	X	X	
		S	Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Berry Creek (Category I Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Rehabilitate Berry Creek (Category I Riparian Corridor) by planting native riparian species		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
Wildlands	108-070-09	Section 7.3.1.33; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Establishment		X			X						Establish Group 2 wet meadow	X		X		X	X	
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 3 and Type 4 wetland rehabilitation				X	X	X	X
						X	X	X				X	X	Implement Type 5 wetland rehabilitation along portions of Berry Creek		X	X	X	X	X	X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Davis Creek (Category I Riparian Corridor) and Berry Creek (Category II Riparian Corridor)		X	X	X	X	X	
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Davis Creek (Category I Riparian Corridor), and Berry Creek (Category I and II Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Rehabilitate Davis Creek and Berry Creek (Category I Riparian Corridors) and a small segment of Boy Scout Creek (Category III Riparian Corridor) by planting native riparian species		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor		X	X				
Wildlands	108-070-08	Section 7.3.2.34; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 3 and Type 4 wetland rehabilitation				X	X	X	X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Davis Creek (Category I Riparian Corridor)		X	X	X	X	X	

Table 7-2. Continued

Parcel Name	Assessor's Parcel Number (APN)	Location of Work Plan Components	Mitigation Goal	Mitigation Actions Summary										Mitigation Action(s) Described	Habitat Functions and Values Affected by Mitigation Actions						
				Improve Hydrology	Expand Habitat	Increase Habitat Complexity	Control Invasive Plants	Plant and Seed Native Wetland Species (woody and herbaceous)	Plant Native Riparian Species	Plant Oaks	Maintain or Improve Habitat for Listed Plants	Maintain or Improve Habitat for Native Wetland Species	Land Management Improvements		Groundwater Recharge	Sediment Retention	Nutrient Removal	Biomass Increase	Wildlife Diversity	Aquatic Diversity	Uniqueness
			Riparian Rehabilitation		X									Enhance existing riparian vegetation adjacent to Davis Creek (Category I Riparian Corridor) and an unnamed tributary to Davis Creek (Category II and III Riparian Corridor) by widening the riparian corridor and planting additional vegetation				X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
			Other Waters Rehabilitation			X		X	X				X	Rehabilitate Davis Creek (Category I Riparian Corridor) and an unnamed tributary to Davis Creek (Category II and III Riparian Corridor) by planting native riparian species		X	X	X	X	X	
													X	Discontinue grazing, remove grazing infrastructure, install livestock exclusion fencing, and widen the riparian corridor			X	X			
Wildlands	108-030-08	Section 7.3.2.35; Appendix C	Baker's Meadowfoam Rehabilitation				X				X		X	Implement grazing management plan to maintain or improve observed and potential habitat for Baker's meadowfoam populations							X
			Wetland Rehabilitation (Grazed Areas)				X					X	X	Implement grazing management plan to rehabilitate wet meadow							X
			Wetland Rehabilitation (Ungrazed Areas)										X	Discontinue grazing and remove grazing infrastructure			X	X			
						X	X	X				X	X	Implement Type 3 wetland rehabilitation				X	X	X	X
			Riparian Establishment		X	X	X		X					Widen riparian corridor by planting riparian species outside existing riparian vegetation along Davis Creek (Category I Riparian Corridor)		X	X	X	X	X	

As part of this MMP, Caltrans prepared construction-level grading plans and planting plans for the onsite and offsite mitigation areas. The grading plans include information on existing and proposed contours, representative cross sections, and construction details. The planting plans include plan view planting plans, plant and seed palettes, and planting details. These plans will form the basis for the mitigation construction plans and special provisions package that will be developed for contractor use in bidding and implementing the mitigation plans. The construction-level plans included in this MMP are shown in the following appendices.

- Appendix D presents planting plans for the onsite reestablishment areas.
- Appendix E presents grading and planting plans and for the offsite wetland establishment areas, planting plans for the wetland rehabilitation areas, and planting plans for the riparian establishment, riparian rehabilitation, other waters rehabilitation, and oak woodland establishment mitigation areas.
- Appendix F presents grading and planting plans for the onsite fish passage improvement projects on Haehl and Upp Creeks and the offsite headcut and erosion repair projects.

Note that units of measure (metric and English) vary in Appendices D–F for the grading and planting plans for offsite mitigation parcels.

7.1.1 Onsite Mitigation

Onsite mitigation will be implemented in the bypass project footprint. Temporarily affected riparian and wetland habitat in the bypass project footprint will be reestablished to preproject conditions or better by reestablishing original soil grades and seeding and planting with native species appropriate for the habitat type. Table 7-1 summarizes reestablishment actions for the onsite mitigation areas. Design drawings for the onsite mitigation actions described in this chapter are presented in Appendix D. Appendix D includes a plan view of the planting plan; plant lists by habitat type (with plant name, plant material type and size, percent planting mix [or application rate], and density); and planting details for the onsite mitigation areas. Please note that onsite mitigation also includes the optional-use Oil Well Hill borrow site. Mitigation for this site is being handled separately from other onsite mitigation. Caltrans has prepared a site-specific reclamation plan that requires the borrow site to be excavated by cutting the hillside back beginning at the toe and excavating back toward the top of the hill, creating a “cut slope.” Prior to hillside excavation, all topsoil and duff will be harvested and stockpiled for reapplication on excavated areas. Once use of the borrow site is finished, cut slopes will be contour-graded and stockpiled topsoil and duff will be reapplied. Soil will be amended with organic slow release

fertilizer and compost as necessary. Cut slopes will be planted with native plants, propagated from local source material, to stabilize slopes and prevent erosion and to protect water quality.

As part of onsite mitigation implementation, Caltrans has prepared mitigation construction plans and special provisions for contractor use based on the onsite mitigation design drawings in Appendix D and the fish passage improvement (other waters rehabilitation areas) design drawings in Appendix F. Additional information in the mitigation construction plans and special provisions includes plant quantities for each rehabilitation site, text special provisions (based on the information in this chapter), and a cost estimate (for bid evaluation and comparison purposes). It is recommended that the reader refer to Appendices C, E, and F while reviewing this chapter to facilitate a full understanding of the bypass project's mitigation program.

7.1.2 Offsite Mitigation Design Approach

Offsite mitigation will be implemented on 37 parcels in Little Lake Valley, some of which are adjacent to the bypass alignment (Benbow, Brooke, Ford, Lusher, and Niesen) and others that are farther away (e.g., Arkelian, Frost, Goss, Huffman, MGC Plasma Middle, MGC Plasma North, Nance, Watson East, and Wildlands). Table 7-2 summarizes habitat establishment and rehabilitation and preservation at the offsite mitigation parcels. Appendix C is organized by offsite mitigation parcel and shows riparian, wetland, and other waters habitat establishment; wetland, riparian and other waters rehabilitation; oak woodland habitat establishment; and wetland, other waters, and oak woodland preservation.

As part of offsite mitigation implementation, Caltrans has prepared mitigation construction plans and special provisions for contractor use based on the mitigation actions presented in Appendix C. Appendix E—the offsite mitigation design drawings—shows wetland, riparian, and oak woodland habitat establishment and wetland rehabilitation areas. Appendix E includes an overview plan; plan and section views of the grading plan; plan view of the planting plan; plant lists by habitat type (with plant name, plant material type and size, percent planting mix [or application rate], and density); and planting details for the wetland establishment offsite mitigation parcels.

The plan view layout plans in Appendix E (L-Sheets) identify the location of fence removal and replacement areas and include fence construction details. Existing fence removal will require the complete removal of all existing materials including, but not limited to, wooden and metal fence posts, gates, barbed wire, woven wire fence, and corrals. The mitigation construction and special provisions also require the removal of nonfunctional fence and gate materials that may occur on the mitigation parcels. Caltrans will employ a wildlife friendly design for all new perimeter and

cross fences.When determining the wetland mitigation potential at the offsite mitigation parcels, the following local habitat conditions at each parcel were evaluated in the field and from related literature.

- **Habitat types and characteristics**—species composition and plant densities/cover information from existing habitat types were considered part of mitigation design efforts, including development of mitigation seed mixes and plant palettes and performance standards (Chapter 9).
- **Soils and topography**—soils information from wetland delineation reports, soil surveys, and field observations was used to identify appropriate wetland establishment and rehabilitation actions.
- **Hydrology**—in most cases, drainages on the offsite mitigation parcels are a combination of historical flow paths and modified alignments for improved drainage and simplified maintenance practices to control parcel hydrology, vegetation, and sediment accumulation. Modifying the hydrology of the parcels through the grading of some of these existing drainages will allow a longer residence time of surface water on the parcel to support wetland and riparian establishment efforts.
- **Land use**—the offsite mitigation parcels historically have supported agriculture (e.g., livestock grazing); a grazing management plan has been developed (Appendix Q) that emphasizes land management goals to rehabilitate and preserve sensitive biological resources over agricultural production (seasonal grazing at a moderate level of intensity may be beneficial for NCSG and BM). The grazing plan includes prescriptions for type of livestock to be grazed, season of grazing, grazing rotation, level of intensity/stocking rates (i.e., animal per acre limits), and thatch levels (or residual dry matter [RDM]). The grazing management plan recommends a reduction in grazing levels, or complete exclusion, during plant establishment. Once mitigation plantings have achieved performance standards, grazing levels would be adaptively managed to determine whether plantings could tolerate grazing. Grazing and haying will be discontinued on certain designated mitigation parcels.
- **State-listed plants**—offsite mitigation has been designed to avoid observed populations of NCSG and BM should they occur on offsite mitigation parcels. If individuals or populations of BM are found, and temporary or permanent impacts are unavoidable during implementation of the mitigation actions, plant duff and topsoil will be salvaged for onsite relocation following mitigation construction (Section 7.2.1.4).

7.1.2.1 NORTH COAST SEMAPHORE GRASS DESIGN APPROACH

Specifically with respect to NCSG establishment and rehabilitation, the above information was used to develop the following design criteria.

- Establish 2.97 acres of NCSG habitat on the Huffman mitigation parcel (Appendix C).
- Implement site management techniques to provide suitable establishment conditions for NCSG.
- Rehabilitate NCSG habitat on the Arkelian, Goss, Frost, Lusher, and MGC Plasma North parcels.
- Develop a grazing plan to support the long-term management of NCSG establishment and rehabilitation areas.

7.1.2.2 BAKER'S MEADOWFOAM DESIGN APPROACH

Specifically with respect to BM rehabilitation, the above information was used to develop the following design criteria.

- Rehabilitate BM habitat on offsite mitigation parcels.
- Develop a grazing plan to support the long-term management of BM rehabilitation areas.

7.1.2.3 WETLAND ESTABLISHMENT DESIGN APPROACH

Specifically with respect to wetland establishment, the above information was used to develop the following design criteria.

- Establish wet meadow wetlands on offsite mitigation parcels with appropriate soils and hydrology, as indicated by existing wet meadow wetlands located in the immediate vicinity of the proposed established wetlands (Appendix C). Table 6-5 identifies the wetland establishment acreage for each offsite mitigation parcel.
- Establish wet meadow wetlands that support similar native wetland plants and have a species richness and native species cover on par with existing wet meadow wetlands in the immediate vicinity of the proposed established wetlands.
- Establish wet meadow wetlands with a hydroperiod similar to that of existing wet meadow wetlands in the immediate vicinity of the proposed established wetlands.
- Minimize effects on sensitive biological resources (e.g., special-status plants, riparian habitat, wetlands, oak woodland) from wetland establishment activities.

7.1.2.4 WETLAND REHABILITATION DESIGN APPROACH

Specifically with respect to wetland rehabilitation, the above information was used to develop the following design criteria.

- Rehabilitate existing wetlands on offsite mitigation parcels (Appendix C). Table 6-5 identifies the wetland rehabilitation acreage for each offsite mitigation parcel. Rehabilitation will consist of grazing some wet meadow on some pastures and removing grazing and implementing Type 1–Type 5 rehabilitation actions.
- Develop plant palettes appropriate for each wetland rehabilitation mitigation unit based on unit-specific soils and hydrology.
- Rehabilitate wetlands with native wetland plants that occur in each rehabilitation mitigation unit or with other site-appropriate species.
- Minimize effects on sensitive biological resources (e.g., special-status plants, riparian habitat, wetlands, oak woodland) from wetland rehabilitation activities.

7.1.2.5 RIPARIAN ESTABLISHMENT DESIGN APPROACH

Specifically with respect to riparian habitat, the above information was used to develop the following design criteria.

- Establish riparian habitat in the Category I, II, and III corridors where riparian vegetation does not occur (Appendix C). Tables 6-3 and 6-4 identify the riparian mitigation acreage for each offsite mitigation parcel.
- Riparian establishment will include permanently excluding cattle from the riparian corridors. Flash grazing of riparian corridors can be a beneficial practice when applied within an adaptive management process. If applied to this project, flash grazing would only occur during the long-term management period. The decision to implement a flash grazing program in the project's riparian corridors would be made in association with the resources agencies. The NRWQCB specifically expects the Land Manager to provide the NRWQB with a proposal for their review and approval prior to flash grazing. The grazing management plan provides guidelines for grazing riparian corridors (Appendix Q).
- Develop plant palettes for each riparian planting area based on unit-specific soils and hydrology.
- Establish riparian habitat with native riparian plants that occur in adjacent mitigation units or with other site-appropriate species.

- Minimize effects on sensitive biological resources (e.g., wetlands, other waters) from riparian establishment activities.

7.1.2.6 RIPARIAN REHABILITATION DESIGN APPROACH

Specifically with respect to riparian habitat, the above information was used to develop the following design criteria.

- Rehabilitate riparian habitat in the Category I, II, and III corridors where riparian vegetation occurs (Appendix C) by permanently excluding cattle from the riparian corridors and planting riparian vegetation adjacent to existing riparian vegetation to widen the riparian corridor. Tables 6-3 and 6-4 identify the riparian mitigation acreage for each offsite mitigation parcel.
- Flash grazing of riparian corridors can be a beneficial practice when applied within an adaptive management process. If applied to this project, flash grazing would only occur during the long-term management period. The decision to implement a flash grazing program in the project's riparian corridors would be made in association with the resources agencies. The NRWQCB specifically expects the Land Manager to provide the NRWQB with a proposal for their review and approval prior to flash grazing. The grazing management plan provides guidelines for grazing riparian corridors (Appendix Q).

7.1.2.7 OTHER WATERS REHABILITATION DESIGN APPROACH

Specifically with respect to other waters rehabilitation, the above information was used to develop the following design criteria.

- Rehabilitate other waters on offsite mitigation parcels (Appendix C) by permanently excluding cattle from the riparian corridors and planting riparian vegetation adjacent to existing riparian vegetation to lengthen and widen the riparian corridor. Table 6-6 identifies the other waters rehabilitation acreage requirements. Figure 7-2 presents a representative cross section of the other waters rehabilitation areas.
- Implement headcut repairs on three offsite mitigation parcels and bank erosion repairs on one offsite mitigation parcel.
- Minimize effects on sensitive biological resources (e.g., special-status plants, riparian habitat, wetlands, oak woodland) from other waters rehabilitation activities.

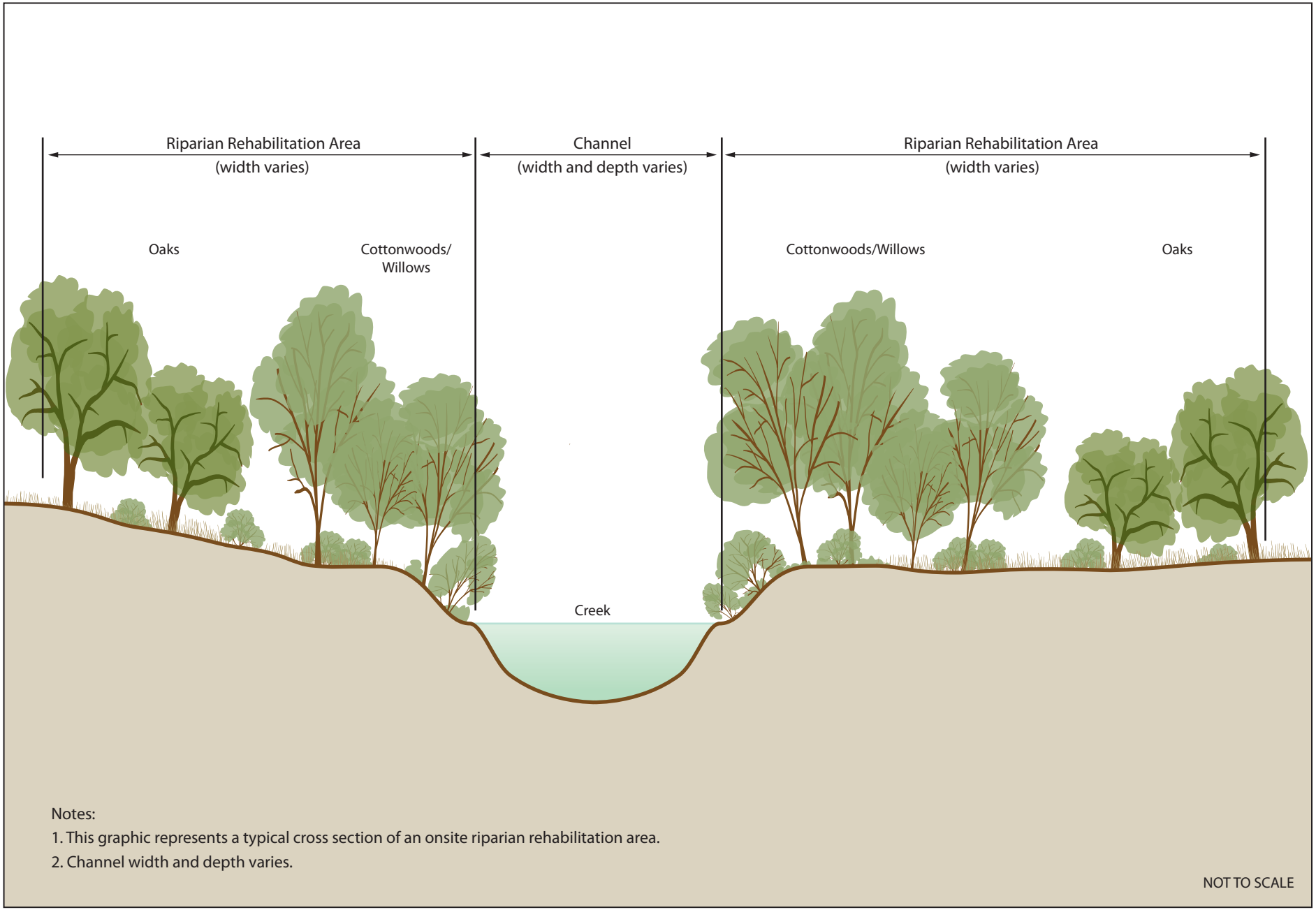


Figure 7-2
Typical Onsite Riparian Rehabilitation Area

7.1.2.8 OAK WOODLAND DESIGN APPROACH

Specifically with respect to oak woodland, the above information was used to develop the following design criteria.

- Establish oak woodland on the Watson east parcel (Appendix C). Tables 6-10 and 6-11 identify the oak woodland mitigation acreage for each offsite mitigation parcel.
- Develop plant palettes based on unit-specific soils and hydrology.
- Establish oak woodland habitat with native oaks and other plants that occur in nearby habitats or with other site-appropriate species.
- Minimize effects on sensitive biological resources (e.g., special-status plants, wetlands) from oak woodland establishment activities.
- Preserve oak woodland and associated grassland habitat on the Taylor parcels.

7.1.3 Mitigation Implementation Schedule

Because of funding constraints, the project will be constructed in two phases. Phase 1 will construct a functional interim facility consisting of a two-lane highway and the interchanges at the south and north ends of the bypass. These two lanes will run the entire length of the project limits and will serve as the southbound lanes in the ultimate configuration under Phase 2. Phase 1 is expected to begin in spring 2013and end in summer 2018, although major ground-disturbing activities are not expected to begin until spring 2013.

Phase 2 will construct the remaining two lanes—creating a full four-lane facility—when sufficient funding becomes available. Because only the two southbound lanes and interchanges will be constructed in Phase 1, per this MMP Caltrans will implement mitigation for the temporary and permanent impacts of Phase 1; mitigation for impacts resulting from Phase 2 will be identified at the time Phase 2 is permitted. Mitigation for Phase 1 of the project will be implemented concurrently with the beginning of Phase 1 construction.

Figure 7-1 shows the mitigation implementation schedule. It should be noted that the schedule stems from commencement of construction; if construction is delayed, the remainder of the schedule will be adjusted accordingly. Also, because of the size of the mitigation project and a finite availability of planting stock per season, planting schedules may be adjusted and phased as necessary, which will alter the schedule.

Location and Task	2013	2014	2015	2016	2017	2018	2019
Arkelian Offsite Mitigation Parcel							
North Coast semaphore grass rehabilitation							
Wetland rehabilitation							
Benbow Offsite Mitigation Parcels							
Baker's meadowfoam rehabilitation							
Wetland establishment							
Wetland rehabilitation							
Riparian rehabilitation							
Other waters rehabilitation							
Brooke Offsite Mitigation Parcels							
Wetland rehabilitation							
Riparian establishment							
Riparian rehabilitation							
Other waters rehabilitation							
Ford Offsite Mitigation Parcels							
Baker's meadowfoam rehabilitation							
Wetland establishment							
Wetland rehabilitation							
Riparian establishment							
Riparian rehabilitation							
Other waters rehabilitation							
Frost Offsite Mitigation Parcel							
North Coast semaphore grass rehabilitation							
Baker's meadowfoam rehabilitation							
Wetland rehabilitation							
Other waters rehabilitation							
Huff Offsite Mitigation Parcel							
Wetland preservation							
Other waters preservation							
Huffman Offsite Mitigation Parcel							
North Coast semaphore grass establishment							
Wetland rehabilitation							
Goss/MGC Plasma North and Middle Offsite Mitigation Parcels							
North Coast semaphore grass rehabilitation							
Baker's meadowfoam rehabilitation							
Wetland establishment							
Wetland rehabilitation							

Figure 7-1. Mitigation Implementation Schedule

Location and Task	2013	2014	2015	2016	2017	2018	2019
Lusher Offsite Mitigation Parcels							
North Coast semaphore grass rehabilitation							
Baker's meadowfoam rehabilitation							
Wetland establishment							
Wetland rehabilitation							
Riparian establishment							
Riparian rehabilitation							
Other waters rehabilitation							
Nance Offsite Mitigation Parcel							
Baker's meadowfoam rehabilitation							
Wetland rehabilitation							
Riparian establishment							
Riparian rehabilitation							
Other waters rehabilitation							
Niesen Offsite Mitigation Parcel							
Baker's meadowfoam rehabilitation							
Wetland establishment							
Wetland rehabilitation							
Taylor Offsite Mitigation Parcels							
Oak woodland preservation							
Oak woodland grassland preservation							
Watson Offsite Mitigation Parcels							
Baker's meadowfoam rehabilitation							
Wetland establishment							
Wetland rehabilitation							
Other waters rehabilitation							
Oak woodland establishment							
Wildlands Offsite Mitigation Parcels							
Baker's meadowfoam rehabilitation							
Wetland establishment							
Wetland rehabilitation							
Riparian establishment							
Riparian rehabilitation							
Other waters rehabilitation							

Figure 7-1. Mitigation Implementation Schedule (Continued)

Construction of onsite mitigation will begin following completion of Phase 1 project construction and will be completed well before the start of Phase 2 project construction. Construction of onsite mitigation will occur in the footprint of the temporary disturbances and will not result in additional impacts on wetland habitat and sensitive biological resources.

Construction of offsite mitigation (mobilization and site preparation) will begin simultaneously with Phase 1 project construction and will be completed well before the start of Phase 2. Construction of offsite mitigation will be planned to minimize impacts on wetland habitat and sensitive biological resources (e.g., vegetation clearing associated with mitigation construction will be scheduled to reduce disruption of breeding and nesting birds). Excess overburden material from the Niesen offsite mitigation parcel will be removed and used for fill in the bypass alignment. Because the Niesen parcel will serve as a Phase 1 construction staging area, mitigation at this offsite parcel will be implemented near the end of Phase 1 construction.

7.2 Onsite Mitigation Implementation

Onsite mitigation implementation will focus primarily on reestablishing temporarily affected wetland and riparian habitat within the bypass project footprint (Appendix D). In addition, onsite minimization efforts related to State-listed plant species (e.g., seed collection, plant transplantation, topsoil harvesting and stockpiling) will be required. Onsite mitigation actions will entail the following activities, discussed below.

- Site preparation.
- Grading.
- Seeding.
- Collecting and installing planting stock.
- Inspecting construction.
- Documenting as-built conditions.

7.2.1 Site Preparation

Preparation of onsite mitigation sites will consist of these activities, discussed below.

- Installing ESA fencing around the perimeter of avoided habitat.
- Clearing vegetation.

- Salvaging State-listed plant populations (seed, plants, and topsoil).

7.2.1.1 ENVIRONMENTALLY SENSITIVE AREA FENCING

Prior to construction, Caltrans will install protective fencing and, where necessary, silt fencing around ESAs to be avoided. Protective fencing will consist of orange plastic-mesh fencing that is secured to metal T-posts and will be installed in accordance with the project construction documents. Silt fencing may be installed around avoided wetlands, other waters, and riparian habitat to prevent soil and sediment from entering the habitat. The project's contractor will prepare a SWPPP. The SWPPP will include all required BMPs. Silt fencing may be used in combination with protective fencing and will be installed in accordance with the SWPPP. The BMPs will be those specified in the updated MRP to be prepared by NCRWQCB and/or those specified in the project construction documents.

7.2.1.2 INSTALLING EROSION CONTROL MEASURES AND USING BEST MANAGEMENT PRACTICES

Implementation of the mitigation will require a SWPPP. Specific erosion control measures and BMPs will be provided in the document. Caltrans will review the contractor-prepared SWPPP for compliance with the mitigation construction plans and special provisions. The SWPPP then will be submitted to the NCRWQCB for approval. The following typical erosion control measures and BMPs have been identified in the mitigation construction plans and special provisions. These measures will be employed during site preparation and construction efforts and remain in place until ground-disturbing activities have ended (not an exhaustive list).

- Prior to the start of construction activities, all personnel will receive water pollution–control training.
- A temporary construction entrance will be installed and maintained to provide temporary access to the mitigation construction areas.
- Temporary fiber rolls will be installed and maintained around areas in which grading activities will occur to reduce sedimentation.
- Exposed slopes will be hydroseeded upon completion of construction activities to reduce erosion and sedimentation.
- Materials will be delivered, used, and stored in a way that minimizes or eliminates discharge of material into watercourses.

- Fueling, lubrication, maintenance, storage and staging of vehicles and equipment will be at least 150 feet beyond waters of the U.S and the State with the exception of cranes and stationary equipment, which will only be refueled using a company certified by the CDFG.
- Material stockpiles will be covered with plastic sheeting or geosynthetic fabric when not in use and surrounded with a linear sediment barrier, and/or placed on pallets.
- Wastewater from invasive species control and equipment washing must be disposed of at an appropriately permitted facility or comply with the proper NPDES requirements for discharges. Wastewater from vehicle cleaning will not be allowed for on-site use for any purposes unless it is demonstrated to the satisfaction of the NCRWQCB that it has been adequately treated for potential pollutants and invasive species.
- Spill- and leak-prevention procedures will be implemented for chemicals and hazardous substances stored at the mitigation construction site.
- Trash and debris will be removed from the job site at least once per week and will not be allowed to accumulate.

7.2.1.3 VEGETATION CLEARING

Wetland and riparian habitat will be reestablished in the footprint of project construction temporary impact areas. Vegetation will be cleared by the construction contractor according to the clearing and grubbing specification in the project construction plans. The stripped vegetation will be legally disposed of offsite at a landfill or other facility that accepts green waste. (Because the woody vegetation may include oaks, it will be necessary to confirm with the disposal facility that oak wood is accepted in view of possible disposal quarantines related to sudden oak death disease.) As an alternative to offsite disposal, woody vegetation can be chipped and used as mulch in watering basins to be constructed around riparian plants (Sections 7.2.4.1–7.2.4.3).

7.2.1.4 STATE-LISTED PLANTS POPULATIONS

NORTH COAST SEMAPHORE GRASS

Prior to the beginning of ground-disturbing project construction activities, observed populations of NCSG to be affected by construction on the Huffman parcel will be identified in the field and mapped, preferably when the plants are in bloom and most evident and identifiable (April–June) in preparation for seed and plant material salvage. When the biological monitor has determined that the seeds have matured, the seeds will be harvested. After the seeds have been harvested, the plants will be excavated and transplanted to the adjacent Huffman mitigation parcel. This location will be protected by a new barbed-wire fence constructed by Caltrans (Appendix E).

The seed will be collected for conservation at a germplasm repository, for direct sowing at the transplantation location and for propagation by a native plant nursery experienced in native grass propagation for planting in the transplantation locations.

To protect NCSG against future unnecessary disturbance from highway maintenance activities, the plant will be added to Caltrans' District 1 ESA database. This database serves to inform Caltrans staff, such as maintenance personnel, of sensitive resources present within Caltrans' right-of-way. Caltrans also will delineate NCSG in the field with ESA paddles as a means of identification for Caltrans maintenance staff and for the public.

BAKER'S MEADOWFOAM

Prior to the beginning of ground-disturbing project construction activities, observed populations of BM to be affected by construction at a predetermined location (Quail Creek interchange area) where BM occurs within the project footprint will be salvaged as plant duff and topsoil for relocation to the Watson East offsite mitigation parcel (APN 037-221-30), where the harvested material will be used to topdress established wetlands at the parcel that are also potential BM habitat. The timing of salvage operations will be determined by a biological monitor. Additional information about the salvage, storage, and placement of BM is described in Section 7.3.1.2.

Boundaries of observed populations will be identified and marked in the field using previously collected GPS data. The uppermost 1–2 inches of topsoil and plant duff will be harvested together and stockpiled in upland areas on the MGC Plasma South parcel and moved to the Watson East parcel at the time of wetland construction. The MGC Plasma South parcel is owned by Caltrans but is not part of the proposed mitigation. The specific location of topsoil stockpile areas will be identified in the construction plans and specifications for contractor use. To prepare stockpile areas, existing ruderal vegetation will be removed and legally disposed of offsite at a landfill or other facility that accepts green waste.

The amount of topsoil/duff salvaged will not exceed the amount that is needed at the Watson East offsite mitigation parcel. Topsoil/duff stockpiles will be stored separately from other grading spoils. The topsoil/duff will be stored at ambient temperatures and protected from rainfall. It is expected that salvaged topsoil/duff stockpiles will be reapplied within a season; if the timeframe is longer, additional management of the stockpiles may be necessary to maintain seed viability.

7.2.2 Grading

Temporarily affected locations will be graded as necessary to reestablish appropriate topography and site drainage. The disturbed locations will be configured to replicate preproject conditions as closely as possible, based on topography as described in bypass construction documents. These plans contain the preproject elevations that will be used to guide the grading effort to establish preproject conditions. These plans will be provided to the resource agencies as a stand-alone submittal at the time the MMP is submitted.

Erosion control seed mixes will be applied after grading is complete but before the onset of wet season rains to prevent loosened material/sediment from entering wetlands or waters near the bypass project footprint.

7.2.3 Seeding

Temporarily affected riparian and wetland locations will be seeded with an erosion control seed mix or a wet meadow seed mix, depending on their location in the bypass project footprint. Seeding will be performed prior to container plant, cutting, and acorn installation. Based on availability, seed will be collected using the following hierarchy: (1) Little Lake Valley, (2) Outlet Creek basin, and (3) Eel River watershed. Temporarily affected wetlands in the viaduct construction area will be seeded with a wet meadow seed mix (Table 7-3). All temporarily affected riparian locations and wetland locations outside the viaduct construction area will be seeded with an erosion control seed mix (Table 7-4). The seed mixes may be revised based on seed availability at the time of mitigation construction and seed application.

The erosion control seed mix and wet meadow seed mix will be applied at the rates shown on Tables 7-3 and 7-4. The seed mixes will be applied using standard drill seeding or hydroseeding techniques. Drill seeding works best when applying seed to large areas that have a simple shape (e.g., square or rectangle). Hydroseeding can be used in a variety of areas. After hydroseeding, mulch (e.g., sterile rice straw or an approved weed-free equivalent) will need to be applied to protect the seed until it germinates. The mulch material will be of high quality (i.e., not musty, moldy, caked, or otherwise of low quality). The use of mulch that contains invasive plants will not be permitted.

Straw mulch material will be stabilized using a mulch crimper or equivalent straw-anchoring tool. The crimper will be straight and capable of firmly punching the mulch into the soil. Hand methods will be used to anchor the straw where crimping equipment cannot be operated safely.

Straw mulch material also may be stabilized using a suitable tackifier. If a tackifier is used, it will be applied uniformly over the mulch material at the specified rate.

Table 7-3 Wet Meadow Seed Mix for Wetland Reestablishment Areas

Scientific Name	Common Name	Wetland Indicator Status (Reed 1988)	Application Rate (Kilograms Pure Live Seed/Hectare)
Agrostis exarata	Spike bentgrass	FAC	1.1
Alopecurus aequailis	Short-awned foxtail	OBL	1.1
Alopecurus saccatus	Pacific foxtail	OBL	4.5
Carex densa	Dense sedge	OBL	1.1
Carex nebrascensis	Nebraska sedge	OBL	1.1
Danthonia californica	California oatgrass	FACW	2.2
Deschampsia danthoniodes	Annual hairgrass	FACW	2.2
Euthamia occidentalis	Western goldenrod	OBL	2.2
Hordeum brachyantherum ssp. *Californicum*	California barley	FACW	13.4
Juncus bolanderi	Bolander's rush	OBL	2.2
Juncus effusus	Bog rush	OBL	1.1
Juncus patens	Spreading rush	FAC	1.1
Juncus xiphioides	Iris-leaved rush	OBL	2.2
Lasthenia glaberrima	Smooth goldfields	OBL	2.2
Leymus triticoides	Creeping wildrye	FAC	2.2
Total			**39.90**

Table 7-4. Erosion Control and Upland Seed Mix for Disturbed Areas Adjacent to Wetland Reestablishment Areas

Scientific Name	Common Name	Wetland Indicator Status (Reed 1988)	Application Rate (Kilograms Pure Live Seed/Hectare)
Achillea millefolium	Common yarrow	FACU	3.4
Bromus carinatus var. *carinatus*	California brome	UPL	10.1
Clarkia purpurea ssp. *quadrivulnera*	Four-spot	UPL	1.1
Danthonia californica	California oatgrass	FACW	1.1
Elymus glaucus ssp. *glaucus*	Blue wildrye	FACU	5.6
Eschscholzia californica	California poppy	UPL	1.1
Festuca californica	California fescue	FACU	3.4
Hordeum brachyantherum ssp. *Californicum*	California barley	FACW	10.1
Lotus purshianus var. *purshianus*	Spanish lotus	UPL	4.5
Lupinus bicolor	Miniature lupine	UPL	5.6
Nassella pulchra	Purple needlegrass	UPL	10.1
Total			**56.1**

7.2.4 Planting Stock Collection and Installation

Temporarily affected wetland and other waters locations in the onsite mitigation area will be planted using container stock, cuttings, and/or seeds (acorns). The seed mixes will be composed of those species identified as target species by USACE (Table 7-5) and possibly other native wetland plants suitable for wetland reestablishment. Wetland seeding will be performed prior to container plant, cutting, and acorn installation.

Container plants will be planted at the reestablished wetland mitigation sites in the viaduct construction area, and container plants, cuttings, and acorns will be planted at the rehabilitated riparian mitigation sites. Container plants, cuttings, and acorns will be planted at the reestablished riparian and forested wetland mitigation sites. Trees will not be planted directly under the viaduct or bridges where they will interfere with the structure and require continual tree trimming or removal. Only shrubs and herbaceous vegetation will be planted under the viaduct or bridges. Planting density for wet meadow wetland reestablishment sites will be at approximately 5 feet on center. Planting density for riparian and forested wetland reestablishment sites will be at approximately 10 feet on center. The plant palettes for the wetland and other waters reestablishment areas are provided in Appendix D. Table 7-6 presents the onsite mitigation plant palettes for wetland locations. Table 7-7 presents the onsite mitigation plant palettes for riparian planting locations. The plant palettes may be revised based on plant availability at the time of mitigation construction and plant installation.

Table 7-5. List of Hydrophytic Plants Approved for Use on Wetland and Other Waters Mitigation

Growth Form	Scientific Name	Common Name	Wetland Indicator Status[1]	Habitat
Tree	*Acer negundo* (formerly *A. negundo* var. *californicum*)	Box elder	FACW	Shaded streambanks
	Acer macrophyllum	Bigleaf maple	FAC	Stream corridor
	Alnus rhombifolia	White alder	FACW	Permanent streams
	Alnus rubra	Red alder	FACW	Wet places
	Cornus glabrata	Brown dogwood	FACW	Generally moist places
	Cornus sericea	American dogwood	FACW	Generally moist places
	Cornus sessilis	Blackfruit dogwood	FAC	Streambanks
	Fraxinus latifolia	Oregon ash	FACW	Streambanks, woodland
	Populus fremontii ssp. *fremontii*	Fremont cottonwood	FACW	Alluvial bottomland, streamsides
	Populus trichocarpa (formerly *P. balsamifera* ssp. *trichocarpa*)	Black cottonwood	FACW	Alluvial bottomland, streamsides
	Quercus lobata	Valley oak	FAC	Slopes, valleys, savanna
	Salix laevigata	Red willow	NI	Riverbanks, seepage areas, lakeshores, canyons, ditches
	Salix lasiolepis	Arroyo willow	FACW	Shores, marshes, meadows, springs, bluffs
	Umbellularia californica	California bay	FAC	Canyons, valleys, chaparral
	Acer circinatum	Vine maple	FAC	Shaded riparian areas
Shrubs and woody vines	*Baccharis salicifolia* ssp. *salicifolia*	Mule fat	FACW	Canyon bottoms, moist streamsides, irrigation ditches, often forming thickets
	Calycanthus occidentalis	Spicebush	FAC	Moist, shady places, canyons, streamsides
	Clematis ligusticifolia	Virgin's bower	FAC	Along streams, wet places
	Physocarpus captitatus	Pacific ninebark	FACW	Moist banks, north-facing slopes
	Ribes divaricatum	Spreading gooseberry	FACW	Forest edges, streamsides
	Rosa californica	California rose	FAC	Moist areas, streambanks
	Rubus leucodermis	White bark raspberry	No status in Reed (1988) but appears to be at least FAC based on habitat.	Generally open, rocky, and especially moist areas
	Rubus parviflorus	Thimbleberry	FAC+	Moist, shade
	Rubus ursinus	California blackberry	FACW	Moist places, shrubland, streamsides
	Rubus spectabilis	Salmonberry	FAC+	Moist places especially streamsides
	Salix exigua	Narrowleaf willow	OBL	Highly variable
	Salix lucida ssp. *lasiandra*	Pacific willow	OBL	Wet places

Table 7-5. Continued

Growth Form	Scientific Name	Common Name	Wetland Indicator Status[1]	Habitat
	Sambucus nigra ssp. *caerulea* (formerly *S. mexicana*)	Blue elderberry	FAC	Streambanks, openings in forest
	Vitis californica	California grape	FACW	Streamsides, springs, canyons
Ferns and relatives	*Equisetum arvense*	Field horsetail	FAC	Streambanks, wet meadows, springs, and other wet, shaded places
	Equisetum laevigatum	Smooth scouring rush	FACW	Moist, sandy, or gravelly areas
	Equisetum telmateia ssp. *braunii*	Giant horsetail	OBL	Streambanks, roadside ditches, seeps
Grasses and relatives	*Agrostis exarata*	Spike bentgrass	FACW	Moist or disturbed areas, open woodland
	Alisma plantago-aquatica	Water plantain	OBL	Ponds
	Alopecurus aequalis	Short-awned foxtail	OBL	Wet meadows, shores
	Alopecurus saccatus	Pacific foxtail	OBL	Vernal pools, moist meadows
	Beckmannia syzigachne	Slough grass	OBL	Pond margins, streams, marshes
	Carex aquatilis	Water sedge	OBL	Wet places
	Carex athrostachya	Slender beak sedge	FACW	Seasonally moist meadows, marshes
	Carex bolanderi	Bolander's sedge	FACW	Moist meadows, forest
	Carex densa	Dense sedge	OBL	Areas that are at least seasonally wet
	Carex feta	Feta sedge	OBL	Meadows, streambanks, open forest, moist and damp soils
	Carex gracilior	Slender sedge	No status in Reed (1988) but appears to be at least FAC based on habitat.	Grassland, creekbanks, open forest, soil that is at least seasonally moist
	Carex leptopoda (formerly *C. deweyana* ssp. *leptopoda*)	Slender-footed sedge	FACW	Moist soil, wooded areas
	Carex nebrascensis	Nebraska sedge	OBL	Meadows, swamps
	Carex nudata	Naked sedge	FACW	Rocky or sandy streambeds below high-water mark
	Carex pachystachya	Thick-headed sedge	FACW	Canyons, streamsides, and moist, shady places
	Carex praegracilis	Field sedge	FACW	Often alkaline, more or less moist places
	Carex serratodens	Two tooth sedge	FACW	Moist places
	Carex subbracteata	Small bract sedge	FACW	Grasslands to open forests in at least seasonally moist soil
	Carex subfusca	Brown sedge	FAC	Seasonally wet meadows
	Carex tumulicola	Split awn sedge	No status in Reed (1988) but appears to be at least FAC based on habitat.	Meadows, open woodland

Table 7-5. Continued

Growth Form	Scientific Name	Common Name	Wetland Indicator Status[1]	Habitat
Grasses and relatives (*continued)*	*Carex utriculata*	Beaked sedge	No status in Reed (1988) but appears to be at least FAC based on habitat.	Wet places, shallow water
	Carex vesicaria	Blister sedge	OBL	Wet places, shallow water
	Danthonia californica	California oatgrass	FACW	Meadows, forest, generally moist, open sites
	Deschampsia caespitosa	Tufted hairgrass	FACW	Wet sites, meadows, streambanks, coastal marshes, forest, alpine
	Deschampsia danthonioides	Annual hairgrass	FACW	Moist to drying, open sites, meadows
	Deschampsia elongata	Slender hairgrass	FACW	Wet sites, meadows, lakeshores, shaded slopes
	Glyceria leptostachya	Davy manna grass	OBL	Freshwater marshes and lakes
	Hordeum brachyantherum	Meadow barley	FACW	Meadows, pastures, streambanks
	Juncus balticus	Baltic rush	OBL	Moist to more or less dry sites
	Juncus bolanderi	Bolander's rush	OBL	Swampy or sandy ground
	Juncus effusus[2]	Bog rush	OBL	Wet places
	Juncus ensifolius	Three stamen rush	FACW	Wet places
	Juncus orthophyllus	Straightleaf rush	FACW	Inland wet meadows, especially meadows, and streambanks in forest
	Juncus occidentalis	Western rush	FACW	Moist areas
	Juncus oxymeris	Pointed rush	FACW	Swales, montane meadows
	Juncus patens	Spreading rush	FAC	Marshy places, creeks, seeps
	Juncus phaeocephalus	Brown head rush	FACW	Moist places, meadows, edges of marshes
	Juncus tenuis	Slender rush	FACW	Damp places
	Juncus xiphioides	Iris-leaved rush	OBL	Wet places
	Elymus (formerly *Leymus*) *triticoides*	Beardless wild rye	FAC	Moist, often saline, meadows
	Pleuropogon californicus	Annual semaphore grass	OBL	Wet places, vernal pools, wet grassland
	Pleuropogon hooverianus	North Coast semaphore grass	FACW	Wet grassy areas
	Schoenoplectus acutus	Hardstem bulrush	OBL	Marshes, shores, fens, shallow lakes, often emergent
	Scirpus microcarpus	Small fruit bullrush	OBL	Marshes, wet meadows, streambanks, pond margins
	Typha latifolia	Broadleaf cattail	OBL	Unpolluted to nutrient rich freshwater (brackish) marshes

Table 7-5. Continued

Growth Form	Scientific Name	Common Name	Wetland Indicator Status[1]	Habitat
Herbaceous flowering plants	*Allium amplectens*	Narrowleaf onion	UPL	Clays including serpentine, open or wooded places
	Ambrosia psilostachya	Western ragweed	FAC	Roadsides, dry fields
	Apocynum cannabinum	Dogbane	FAC	Moist places, near streams, springs, or as a weed in orchards
	Artemisia douglasiana	Mugwort	FACW	Open to shady areas, often in drainages
	Asclepias fascicularis	Narrowleaf milkweed	FAC	Dry ground, valleys, foothills
	Baccharis glutinosa (formerly *B. douglasii*)	Marsh baccharis	OBL	Coastal freshwater and saltwater marshes, streambanks
	Bidens cernua	Nodding beggartick	OBL	Freshwater wetlands
	Camassia quamash	Common camas	FACW	Damp forests, meadows, streamsides
	Cirsium douglasii	Swamp thistle	OBL	Wet places
	Cornus canadensis	Bunch berry	FAC	Moist forest, bogs
	Euthamia occidentalis	Western goldenrod	OBL	Ditches, marshes, streambanks, meadows
	Oenanthe sarmentosa	Water parsley	OBL	Streams, marshes, ponds, generally aquatic
	Perideridia gairdneri	Gairdner's yampah	FACW	Flats, meadows, streamsides, grassland
	Perideridia howellii	Howell's yampah	FACW	Moist meadows, ravines, streambanks
	Persicaria (formerly *Polygonum*) *hydropiperoides*	Smartweed	OBL	Wet banks, shallow water, marshes, moist prairies
	Persicaria punctata (formerly *Polygonum punctatum*)	Dotted smartweed	OBL	Shallow water, shores, marshes, floodplain forest
	Stachys rigida	Hedgenettle	FACW	Moist to more or less dry places
	Stachys stricta	Sonoma hedgenettle	OBL	Moist, open or shady areas
	Symphyotrichum (formerly *Aster*) *chilense*	Pacific aster	FAC	Grassland, salt marshes, disturbed places
	Symphyotrichum (formerly *Aster*) *foliaceum*	Alpine leafybract aster	FACW	Open woodland to alpine meadows
	Symphyotrichum (formerly *Aster*) *spathulatum*; synonym of *A. occidentalis*	Western mountain aster	FAC	Meadows
	Xanthium strumarium	Cocklebur	FAC	Disturbed, seasonally wet, often alkaline sites, grasslands, marshes, and

Notes:
1. Unless otherwise noted, according to: Reed, P. B., Jr. 1988. *National List of Plant Species that Occur in Wetlands: California (Region 0)*. (Biological Report 88 [26.10]). Washington, DC: U.S. Fish and Wildlife Service Research and Development. Prepared for National Wetlands Inventory, U.S. Fish and Wildlife Service, Washington, DC.
2. Four subspecies recognized in the Jepson Manual (2nd edition); natives are subsp. *austrocalifornicus* and subsp. *Pacificus.*

Table 7-6. Wet Meadow Plant Palette for Wetland Reestablishment Areas

Scientific Name	Common Name	Plant Material Type and Size	Percent of Planting Mix Per Stratum	Wetland Indicator Status (Reed 1988)
Carex athrostachya	Slender beak sedge	Tree band	5	FACW
Carex densa	Dense sedge	Tree band	10	OBL
Carex nebrascensis	Nebraska sedge	Tree band	5	OBL
Carex praegracillis	Field sedge	Tree band	5	FACW
Carex subbracteata	Small bract sedge	Tree band	5	FACW
Carex tumulicola	Foothill sedge	Tree band	5	FAC
Hordeum brachyantherum var. brachyantherum	Meadow barley	Tree band	10	FACW
Juncus bolanderi	Bolander's rush	Tree band	5	OBL
Juncus effusus	Soft rush	Tree band	10	OBL
Juncus balticus	Baltic rush	Tree band	10	OBL
Juncus xiphioides	Iris-leaved rush	Tree band	10	UPL
Leymus triticoides	Creeping ryegrass	Tree band	5	FAC

Note: Plant density will be 5 feet on center.

Table 7-7. Plant Palette for Other Waters Reestablishment Areas

Vegetation Stratum	Scientific Name	Common Name	Plant Material Type and Size	Percent of Planting Mix Per Stratum	Wetland Indicator Status (Reed 1988)
Tree	*Acer negundo*	Box elder	Treepot	15	FACW
	Alnus rhombifolia	White alder	Treepot	10	FACW
	Fraxinus latifolia	Oregon ash	Treepot	15	FACW
	Populus fremontii ssp. *Fremontii*	Fremont cottonwood	Treepot, cutting	10	FACW
	Quercus garryana	Oregon white oak	Treepot, acorn	10	UPL
	Quercus lobata	Valley oak	Treepot, acorn	20	FAC
	Salix laevigata	Red willow	Treepot, cutting	10	FAC
	Salix lasiolepis	Arroyo willow	Treepot, cutting	10	FACW
Shrub	*Cornus sericea*	Red-twig dogwood	Treepot	10	FACW
	Rosa californica	California rose	1 gallon	20	FAC
	Ribes sanguineum	Red-flowering currant	1 gallon	10	UPL
	Rubus leucodermis	White bark raspberry	1 gallon	10	FAC
	Rubus parviflorus	Thimbleberry	1 gallon	10	FAC
	Rubus spectabilis	Salmonberry	1 gallon	10	FAC+
	Rubus ursinus	Wild blackberry	1 gallon	10	FACW
	Sambucus mexicana	Blue elderberry	Treepot	10	FAC
	Vitis californica	Wild grape	1 gallon	10	FACU

Note: Planting density for riparian container plants will be approximately 10 feet on center.

7.2.4.1 CONTAINER PLANT PROPAGATION AND INSTALLATION

Caltrans will contract with a plant nursery experienced with the propagation of native herbaceous and woody plants to propagate container plants for mitigation efforts. The type of propagation material collected will depend on the species, and may be seeds (e.g., acorns) and/or root stock. Based on availability, seeds and/or root stock will be collected using the following hierarchy: (1) Little Lake Valley, (2) Outlet Creek basin, and (3) Eel River watershed. Standard horticultural collection procedures will be used.

Container plants will be planted at the reestablished wetland mitigation sites and at the reestablished other waters mitigation sites (Tables 7-6 and 7-7). Container plants will be planted in fall/winter after rainfall has saturated the soil to a depth of approximately 10 inches. Container plants will be placed in a planting hole that is twice the width of, and no deeper than, the container. Planting holes will be hand-excavated or augered. If planting holes are augered, the sides will be scarified to allow roots to more easily penetrate the surrounding soil. Soil removed when the planting hole is created will be used as backfill and in constructing a watering basin. (Appendix D).

Before planting, the container plant's root mass will be inspected, and any matted, dead, diseased, or twisted roots will be pruned. Inspection and pruning will take place quickly because exposure to the air results in loss of root hairs. Care will be taken during pruning to avoid excessive loss of root mass.

Container plants will be placed in the planting hole so that the root collar is slightly above the desired final grade with the top of the first major root barely visible at the surface. Fertilizer will not be applied during container plant installation. As soil is backfilled, it will be worked around the roots so that they are not compressed into a tight mass, but are spread out and supported by the new soil beneath them. After each 3 to 4 inches of soil have been placed in the hole, the soil will be tamped around the roots with foot or hand pressure, with care taken not to damage the roots.

Watering basins will be constructed around all container plants except those planted in the viaduct construction area, and plant protection cages may be installed to minimize herbivory. A 3-inch layer of bark mulch (this mulch could come from chipped woody vegetation removed as part of vegetation clearing activities [Section 7.2.1.3 Vegetation Clearing]) will be placed in each watering basin to reduce soil evaporation rates and help suppress weed growth.

Container plants will be watered immediately after planting. Container plants will be inspected after initial watering to ensure that they have not settled. Any container plants that have settled will be adjusted so the appropriate length is exposed aboveground.

7.2.4.2 RIPARIAN CUTTING COLLECTION AND INSTALLATION

Caltrans will collect willow and cottonwood cuttings to be planted at the reestablished riparian mitigation sites. Cuttings will be collected from source material using the following hierarchy: (1) Little Lake Valley, (2) Outlet Creek basin, and (3) Eel River watershed. Standard horticultural collection procedures will be used in a manner that minimizes impacts on both the source material and the cuttings. Cuttings will be collected from various source materials to ensure the genetic diversity and viability of the cuttings. Diseased or unhealthy source material will be avoided.

Cutting collection and installation will occur in December and/or January. All cuttings will be hardened-off green wood. Cuttings will be a minimum of 3 feet long and will be tapered from a minimum of 0.5 inch to a maximum of 2.5 inches in diameter. Cuttings will be cut at a right angle at the wide end of the cutting (Appendix D).

Immediately after harvesting, the leaves, branches, and twigs will be carefully removed from each cutting to avoid damage to buds on the cutting. The cuttings then will be wrapped in burlap or other approved material that protects them from sunlight and allows air circulation within the bundle. The bundled cuttings will be maintained in cool, wet storage until just before planting and will be planted within 24 hours of collection.

Planting holes will be excavated for all cuttings. Cuttings will be installed vertically, with the narrow end exposed and two thirds of the cutting buried belowground to ensure the development of adequate root mass. Fertilizer will not be applied during cutting installation. Watering basins will be constructed around cuttings, and plant protection cages will be installed to minimize herbivory. A 3-inch layer of bark mulch (this mulch could come from chipped woody vegetation removed as part of vegetation clearing activities [Section 7.2.1.3, Vegetation Clearing]) will be placed in each watering basin to reduce soil evaporation rates and help suppress weed growth.

Cuttings will be watered immediately after planting and will be inspected after watering to ensure that they have not settled. Any cuttings that have settled will be adjusted so the appropriate length is exposed aboveground.

7.2.4.3 ACORN COLLECTION AND INSTALLATION

Caltrans will collect acorns to be planted at the reestablished riparian mitigation sites. Acorns will be collected from source material using the following hierarchy: (1) Little Lake Valley, (2) Outlet Creek basin, and (3) Eel River watershed. Acorns will be collected from various source materials to ensure the genetic diversity and viability. Diseased, damaged, or unhealthy source material will not be collected.

The planting area will be scraped to loosen the top 1 inch of the soil. Three acorns will be planted at each planting area. Acorns will be placed horizontally in the center of the planting area, 0.5 inch to a maximum of 1 inch below finish grade, in a 9-inch equilateral triangle (Appendix D). Fertilizer will not be applied during acorn installation. Acorn plantings will be watered immediately after planting.

Watering basins may be constructed around all acorn plantings, and plant protection cages may be installed to minimize herbivory. A 3-inch layer of bark mulch (this mulch could come from chipped woody vegetation removed as part of vegetation clearing activities [Section 7.2.1.3, Vegetation Clearing]) will be placed in each watering basin to reduce soil evaporation rates and help suppress weed growth. The bark mulch should not be placed directly on top of the acorns to prevent the acorns from developing mildew and losing their viability (Appendix D).

7.2.4.4 PLANT WATERING

The goal of watering is to provide sufficient water to successfully establish deep-rooted plants that are able to survive without supplemental irrigation. Caltrans will water woody and non-woody plants in the reestablished riparian and wetland mitigation sites after planting and during the postconstruction 3-year plant establishment maintenance period using an irrigation system, a water truck, or other appropriate method as necessary to ensure survival and meet performance standards. Those areas that received the erosion control seed mix only (i.e., no container plants, cuttings, or acorns were planted) will not be watered. Watering frequency and application rates are discussed in Chapter 8. The need to water individual plants or planting areas will be determined on a case-by-case basis (e.g., if a plant area remains saturated much of the year, plant watering may not be necessary).

Small isolated reestablished sites may be truck-watered because the installation of an irrigation system may not be practical; larger reestablished sites may be watered using a temporary drip irrigation system. Potential water sources are existing agricultural wells and City water lines. Because many of the creeks in Little Lake Valley are intermittent, they cannot be used as a

reliable water source. Water may be pulled directly from a well or water line or stored in large plastic tanks and pumped through a delivery system.

7.2.5 Construction Inspections

Caltrans will conduct progress inspections of the habitat reestablishment efforts to ensure that onsite mitigation is fully and properly completed. Areas not meeting the implementation standards outlined above will be reevaluated and replanted as necessary. At a minimum, Caltrans will perform inspections at the following critical stages of mitigation implementation.

- Placement and installation of ESA fencing.
- Installation of erosion control measures and use of BMPs.
- Site preparation and vegetation clearing operations.
- Salvage of BM topsoil and plant duff.
- Salvage of NCSG seed and plant material.
- Transplantation of NCSG.
- Salvage of wetland topsoil and seed material.
- Grading operations, including placement of stockpiled wetland topsoil.
- Seeding and planting operations.
- Irrigation system installation (if applicable) and initial plant watering.

7.2.6 Documentation of As-Built Conditions

Within 45 days from the completion of onsite habitat reestablishment efforts, Caltrans will submit a complete set of as-built drawings to the resource agencies. The as-built drawings will be prepared using MicroStation (version 7 or later) software and will be at the same scale as the construction drawings. The as-built drawings will be prepared following standard landscape architecture protocols and practices. The as-built drawings will depict the features listed below.

- Reestablished habitat, including planted and seeded areas.
- Updated plant palettes, including species, plant material type (e.g., tree band, 1-gallon, cutting, acorn), and number of plants planted by species.
- Updated seed mix, including application rates.

- Plant watering method, including water source identification and delivery system design, and application rates.
- Fences, gates, and access roads.
- Final elevations of reestablishment areas that were disturbed during bypass construction (this information may not be available within the 45-day requirement but will be provided when it becomes available).
- Other pertinent mitigation features.

7.3 Offsite Mitigation Implementation

Mitigation of impacts on sensitive biological resources will be accomplished through a combination of establishment, rehabilitation, and preservation of similar habitats on the offsite mitigation parcels. Offsite mitigation parcels and associated mitigation actions are shown in Appendices C, E, and F. Mitigation actions, by offsite mitigation parcel, are listed in Table 7-2. A narrative summary of the information provided in these Appendices and Table 7-2 is presented below.

- Observed populations of NCSG are shown in Appendix C and on Figures 5-7 through 5-10.
- Observed and potential BM habitat is shown in Appendix K.
- The NCSG establishment area on the Huffman offsite mitigation parcel is shown in Appendix C.
- The NCSG rehabilitation areas on the Arkelian, Goss, MGC Plasma North, Frost, and Lusher offsite mitigation parcels are not graphically depicted but are equivalent to the existing NCSG populations and the wet meadow habitat adjacent to these populations (Appendix C, Figures 5-7, 5-8, and 5-10).
- BM rehabilitation areas are, in most cases, equivalent to the wetland habitat to be grazed on the offsite mitigation parcels (Appendix C).

7.3.1 Offsite Mitigation Actions

This section identifies mitigation actions proposed for each offsite mitigation parcel. Additional detail is provided for those offsite mitigation parcels where wetland establishment is proposed.

The following mitigation actions will be implemented on the offsite mitigation parcels.

- BM rehabilitation.
- NCSG establishment and rehabilitation.
- Wetland establishment, rehabilitation, and preservation.
- Riparian establishment.
- Riparian rehabilitation.
- Other waters rehabilitation and preservation.
- Oak woodland establishment and preservation.

The wetland mitigation actions are summarized in this section to facilitate review of the mitigation actions for each offsite mitigation parcel. Additional information regarding these mitigation types and techniques that will be used to implement the mitigation actions is provided in Section 7.3.3, Offsite Mitigation Techniques.

7.3.1.1 NORTH COAST SEMAPHORE GRASS ESTABLISHMENT AND REHABILITATION

NORTH COAST SEMAPHORE GRASS ESTABLISHMENT

Establishment of NCSG will occur on the Huffman offsite mitigation parcel. Existing NCSG populations on the Huffman parcel are shown in Appendix C and on Figure 5-9. The NCSG establishment area is shown in Appendix C. Mitigation activities on this parcel will include preservation of existing populations and individuals, transplanting salvaged NCSG from the permanent impact areas in the bypass alignment, seeding with NCSG seed collected on the Huffman parcel, and planting of container stock grown from seeds collected on the Huffman parcel.

Caltrans also will develop a management approach to maintain the NCSG populations on the Huffman parcel. Caltrans implemented a pilot study in December 2011 that consisted of transplanting individual plants to and planting container stock in the NCSG establishment area (Caltrans constructed cattle exclusion around the NCSG establishment area in 2010). As part of this study, Caltrans will monitor the effectiveness of these actions and incorporate the lessons learned into future NCSG mitigation activities on this parcel.

CDFG has requested minimization measures for the affected NCSG population on the Huffman parcel. Known populations of NCSG to be affected by construction on this parcel will be salvaged before the commencement of construction for transplantation to the adjacent NCSG establishment area.

The performance objective is to achieve 60% survival of transplanted individuals at the end of 10 years (Table 9-2). Although there are no required performance standards or remediation measures for container plant survival, Caltrans will conduct one replacement planting for plants that have died at the end of Year 5.

NORTH COAST SEMAPHORE GRASS REHABILITATION

Rehabilitation of NCSG will occur on five offsite mitigation parcels (Appendix C, Figures 5-7, 5-8, and 5-10). Mitigation activities on this parcel will include preservation of existing populations and implementing a grazing management program to maintain and enhance the NCSG populations on these parcels. The grazing management plan for the NCSG rehabilitation areas is provided in Appendix Q.

7.3.1.2 BAKER'S MEADOWFOAM REHABILITATION

BM habitat will be rehabilitated on grazed wetlands on several offsite mitigation parcels. The locations of observed and potential BM habitat are shown in Appendix K. The portions of the offsite mitigation parcels to be grazed are shown in Appendix C.

Mitigation activities will include conservation of existing populations, salvaging and placing topsoil at established wetlands on the Watson East parcel, and implementing a grazing management program to maintain and enhance the BM populations on parcels on which it occurs.

Some of the BM populations in the bypass alignment will be salvaged as plant duff and topsoil for relocation to the Watson East offsite mitigation parcel, where the harvested material will be used to topdress established wetlands at the parcel that are potential BM habitat. The timing of salvage operations will be determined by a biological monitor. Additional information about the salvage of BM is described in Section 7.2.1.4.

Wetland topsoil will be stockpiled in upland areas on the MGC Plasma South parcel and moved to the Watson East parcel at the time of wetland construction. The MGC Plasma South parcel is owned by Caltrans but is not part of the proposed mitigation. The specific location of topsoil stockpile areas will be identified in the construction plans and specifications for contractor use. To prepare stockpile areas, existing ruderal vegetation will be removed and legally disposed of offsite at a landfill or other facility that accepts green waste.

The grazing management plan for the BM rehabilitation areas is provided in Appendix Q.

7.3.1.3 WETLAND ESTABLISHMENT

Wetland habitat will be established on some of the offsite mitigation parcels. The type and location of habitat establishment are shown in Appendices C and E and listed in Table 7-2. Wetland establishment will include grading upland habitats to establish depressions or swales that will be seasonally inundated or saturated. Wetland establishment sites occur in one of two groups. Group 1 wetland establishment sites consist of those establishment sites identified in the 2010 MMP. Group 2 wetland establishment sites are those sites identified in summer 2011. Wetland establishment areas will be perpetually excluded from grazing because of a mitigation requirement imposed by the USACE, not specifically germane to this document. To introduce grazing in those areas would conflict with this federal mitigation requirement.

7.3.1.4 WETLAND REHABILITATION—GRAZED AREAS

A grazing management program will occur on approximately two thirds of wet meadow habitat on the offsite mitigation areas. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. Rotational grazing will be used to promote the establishment of native wetland species. The grazing plan for this parcel is described in Appendix Q.

7.3.1.5 WETLAND REHABILITATION—UNGRAZED AREAS

Five types of wetland rehabilitation have been developed. With the more aggressive strategies, wetland rehabilitation will include clearing existing patches of nonnative wetland vegetation and replanting and seeding with native species. In addition to planting and seeding, some level of successional development is part of each rehabilitation type in untreated areas. .

This chapter describes the methods to implement the rehabilitation actions. The wetland rehabilitation types are described below. The type of wetland rehabilitation and the location of each action are shown in Appendices C and E and listed in Table 7-2. Table 6-5 identifies presents the wetland rehabilitation types and associated acreages for each offsite mitigation parcel.

- Type 1 Wetland Rehabilitation promotes passive successional development by removing management activities (grazing and haying) that influence vegetation development. This type applies to areas that: (1) are existing marsh/forest communities; (2) have an existing relative cover of at least 60% of species from the target hydrophytic species list at the time of baseline studies; or (3) are dominated (top 50th percentile) by facultative wetland (FACW) and obligate wetland (OBL) species at the time of baseline studies. This type of wetland rehabilitation occurs primarily on the Watson West parcel (037-250-05). A small amount of

Type 1 rehabilitation will occur on the Watson East parcel (037-221-30) (Table 6-5). Because these parcels already have high-quality wetland habitat over most of the parcel, no mitigation actions will be implemented. The parcels will be monitored during the plant establishment period to ensure that there is no decrease in native plant cover or an influx of noxious plant species.

- Type 2 Wetland Rehabilitation promotes passive successional development by removing management activities (grazing and haying) that influence vegetation development. This type may be applied to areas that have existing relative cover of up to 59% of species from the target hydrophytic species list at the time baseline studies are conducted. Because successional development by itself is a slow process, the amount of time it takes to obtain the maximum functional lift is considerable. Type 2 does not include initial planting, but if the performance standards are not met, remedial actions, including plantings or seeding, may be required. Type 2 wetland rehabilitation occurs on two Benbow parcels (007-010-04 and 007-020-03).
- Type 3 Wetland Rehabilitation includes the active conversion of existing vegetation by removing management activities (grazing and haying) that influence vegetation development, and planting woody and herbaceous native vegetation and seeding a native seed mix suitable to the particular site. Type 3 rehabilitation may be applied to areas that have existing relative cover of up to 40% of species from the target hydrophytic species list at the time of baseline studies.

  Active conversion would require removal and control of invasive and other nonnative plants species followed by the introduction and survival of propagules, container plants, and seeded species from the target hydrophytic species list (Table 7-5). The plant palettes and seed mixes will be composed of those species identified as target species. The list is composed of native species that are present or that have the potential to occur on the mitigation properties. The plant palette, seed mix and plant layout schematic for each Type 3 rehabilitation area is presented in Appendix E. Plant volunteers from the list of target species also would be included when calculating the percent increase. Because of the level of initial planting, Type 3 has less temporal limitation than Type 2. If the performance standards are not met, remedial actions, including additional plantings or seeding, may be required.
- Type 4 and 5 Wetland Rehabilitation requires aggressive conversion of existing vegetation by removing management activities (grazing and haying) that influence vegetation development, and planting woody and herbaceous native vegetation suitable to the particular site. Type 4 and 5 rehabilitation may be applied to areas that have existing relative cover up to 20% of species from the target hydrophytic species list at the time of baseline studies.

Active conversion would require removal and control of invasive and other nonnative plants species followed by the introduction and survival of propagules, container plants, and seeded species from the target hydrophytic species list (Table 7-5). The plant palettes and seed mixes will be composed of those species identified as target species. The list is composed of native species that are present or that have the potential to occur on the mitigation properties. The plant palette, seed mix and plant layout schematic for each Type 4 and 5 rehabilitation area is presented in Appendix E. Plant volunteers from the list also would be included when calculating the percent increase.

Because of the level of initial planting, Types 4 and 5 have less temporal limitation than Type 2. If the performance standards are not met, remedial actions, including additional plantings or seeding, may be required. Type 5 has the same requirements as Type 4, except the Type 5 planting plan includes a higher percentage of woody vegetation along riparian corridors and has a lower performance standard for species richness than Type 4.

Except for the Lusher 038-060-08 parcel, the areas designated as Types 2–5 will be perpetually excluded from grazing because of a permit requirement imposed by the USACE not specifically germane to this document. To introduce grazing in those areas would conflict with this federal mitigation commitment.

7.3.1.6 RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I, II, and III Riparian Corridors that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation; installation of container plants, cuttings, and seeds of native riparian species; seeding with native grasses and forbs; and installing an irrigation system (if necessary). Riparian establishment areas will be excluded from grazing because of a mitigation requirement imposed by the State agencies.

Flash grazing of riparian corridors can be a beneficial practice when applied within an adaptive management process. If applied to this project, flash grazing would only occur during the long-term management period. The decision to implement a flash grazing program in the project's riparian corridors would be made in association with the resources agencies. The NRWQCB specifically expects the Land Manager to provide the NRWQB with a proposal for their review and approval prior to flash grazing. The grazing management plan provides guidelines for grazing riparian corridors (Appendix Q).

7.3.1.7 RIPARIAN REHABILITATION

Riparian rehabilitation will be provided by excluding cattle from the riparian corridors and planting riparian vegetation adjacent to existing riparian vegetation to widen the riparian corridors. Additional information on the implementation of riparian establishment is described in the following section and in Section 7.3.3.5.

Flash grazing of riparian corridors can be a beneficial practice when applied within an adaptive management process. If applied to this project, flash grazing would only occur during the long-term management period. The decision to implement a flash grazing program in the project's riparian corridors would be made in association with the resources agencies. The NRWQCB specifically expects the Land Manager to provide the NRWQB with a proposal for their review and approval prior to flash grazing. The grazing management plan provides guidelines for grazing riparian corridors (Appendix Q).

7.3.1.8 OTHER WATERS REHABILITATION

Other waters will be rehabilitated on the offsite mitigation parcels on which other waters (stream corridors) occur (Appendix C). Other waters rehabilitation actions will vary by offsite mitigation parcel and will be accomplished using one or more techniques.

CATTLE EXCLUSION

Livestock will be excluded from all Category I, II, and III creek channels and Riparian Corridors. Cattle no longer will have access to streams on the offsite mitigation parcels with the exception of designated channel crossings. Cattle exclusion from riparian corridors will decrease soil compaction, reduce streambank erosion, and reduce nutrient and bacteria loads.

The width of the riparian corridor exclusion areas varies by parcel depending on the category type present (Appendix C). All fences and gates will be removed from the riparian corridors and replaced with new materials. The new exclusion fence locations are shown in Appendix E.

HEADCUT AND EROSION REPAIR

Headcut and erosion repair projects will be implemented on four of the offsite mitigation parcels. The general locations of the headcut and erosion repair sites are shown in Appendix C. The construction documents for these features are in Appendix E.

BENBOW (108-04-013)

There is a large headcut located in a swale that is tributary to an intermittent stream on this offsite mitigation parcel. The headcut will be repaired by placing soil fill to establish a step-pool grade control structure (see mitigation construction plans and special provisions for grading plans). Additional information on the headcut repair design is described Section 7.3.2.4, and the construction designs are provided in Appendix E.

FORD (108-010-06)

Three eroding bank sections on Outlet Creek in the center of the parcel will be repaired (Appendices C and E). All three sites have unstable, mostly vegetated cut banks created by convergence flow on the riffle/gravel bar complex on the opposite side of the cut bank. These areas will be repaired by grading back the vertical bank, planting native riparian vegetation, and incorporating instream structures at the toe slope. Additional information on the headcut repair design is described Section 7.3.2.11, and the construction designs are provided in Appendix E.

FROST (108-020-04)

There are five headcuts located near the northeast corner of the parcel. Three of these are instream headcuts on a small unnamed tributary to Berry Creek and two are upland headcuts. The headcuts appear to be unstable and have high potential to contribute sediment to Berry Creek via the unnamed tributary. These sites will be repaired by placing soil fill to establish a step-pool grade control structure. These sites are located in a riparian area that will be fenced to exclude cattle so they will be protected from future cattle disturbance. The headcut repair design is described in Section 7.3.2.16, and the construction designs are provided in Appendix E.

LUSHER (108-030-04)

There are two instream headcuts located on a short unnamed tributary to Old Outlet Creek. The instream headcuts appear unstable with high potential for sediment to enter Old Outlet Creek. These two headcuts will be repaired by placing soil fill to establish a step-pool grade control structure. Additional information on the headcut repair design is in Section 7.3.2.22, and the construction designs are provided in Appendix E.

RIPARIAN ESTABLISHMENT

Native riparian vegetation will be planted and seeded in portions of the Category I, II, and III Riparian corridors that currently do not support woody riparian vegetation. Additional

information on the implementation of riparian establishment is in the following section and in Section 7.3.3.5.

7.3.1.9 OAK WOODLAND ESTABLISHMENT

Oak woodland habitat will be established on a portion of the Watson East parcel. The location of the oak woodland establishment area is shown in Appendix C. The construction documents for the oak woodland establishment area are in Appendix E. Oak woodland establishment will include site preparation to clear the planting area of ruderal vegetation, installation of container plants and acorns of native oak and other oak woodland species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

7.3.2 Mitigation Actions by Offsite Mitigation Parcel

7.3.2.1 ARKELIAN (APN 103-230-04)

The mitigation goals for the Arkelian parcel are NCSG rehabilitation and wetland rehabilitation.

The performance standards for mitigation actions at the Arkelian parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

NORTH COAST SEMAPHORE GRASS REHABILITATION

Rotational grazing will be used to maintain or improve NCSG populations. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for the Arkelian parcel is described in the grazing plan (Appendix Q). Woody shrub and vine species will be removed as they occur in or near NCSG populations to prevent competition with NCSG.

WETLAND REHABILITATION—GRAZED

Wetland rehabilitation will be accomplished by managing grazing to support existing wet meadow and riparian wetland. Grazing management will occur on the entire 9.95-acre parcel, of which 8.63 acres provide wetland rehabilitation credits (Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. Rotational grazing will be used to promote the establishment of native

wetland species. The grazing management for this parcel is described in the grazing plan (Appendix Q).

The small areas of wet meadow on this parcel will be rehabilitated by grazing to manage invasive grasses and promote the establishment of native wetland species. The control of invasive species in the riparian understory will provide opportunities for native plant regeneration.

7.3.2.2 BENBOW (APN 108-020-06)

The mitigation goals for this parcel are BM rehabilitation, Group 2 wetland establishment, and wetland rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this Benbow parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

Wetland establishment at this parcel will consist of Group 2 wetland establishment totaling 1.34 acres (Appendix C and Table 6-5). Three wet meadow units will be established on this parcel. Figure 7-3 is a graphic representation of wetland establishment efforts for the largest of the three wet meadow units, which extends onto two adjacent Wildlands parcels. The grading and planting plans for offsite wetland establishment are presented in Appendix E. The majority of the wetland establishment areas are small inclusions of existing uplands in the wet meadow complex that will be lowered to match, or be slightly lower than, the elevation of adjacent wetland habitat and will be seasonally saturated or inundated by rainfall and/or groundwater. The NRCS soil survey indicates that the soil unit in all three wetland establishment areas is the same as the adjacent wet meadow.

A small berm occurs in the footprint of the largest of the three established wetlands. The berm will be removed during wetland grading. The berm is approximately 1,600 feet long and ranges from 1 to 3 feet in height (Appendix E). Based on anecdotal information provided by John Ford, the berm was constructed by a previous landowner to reduce floodflow onto this parcel by training it back toward Davis Creek. Removal of the berm will not result in adverse effects on existing or established wetlands because the topography from Davis Creek and the west side of this parcel slopes gently to the west and will not result in high velocity overbank events or significant sediment deposition.

A soil survey was performed in December 2011for the largest of the three proposed wetlands. The soil survey results, presented in Appendix O, indicate that the soils at this location are suitable for wetland establishment. The detailed soil evaluation assigned a wetland establishment suitability rating of *medium-high* to this parcel. The soil was inferred generally to have moderate permeability, but with a moderate to high permeability in part of the depth range of 11 to 19 inches because of the presence of fine loamy sand material. However, the soil will be a moderately permeable loam at and just below finish grade and therefore suitable for wetland establishment.

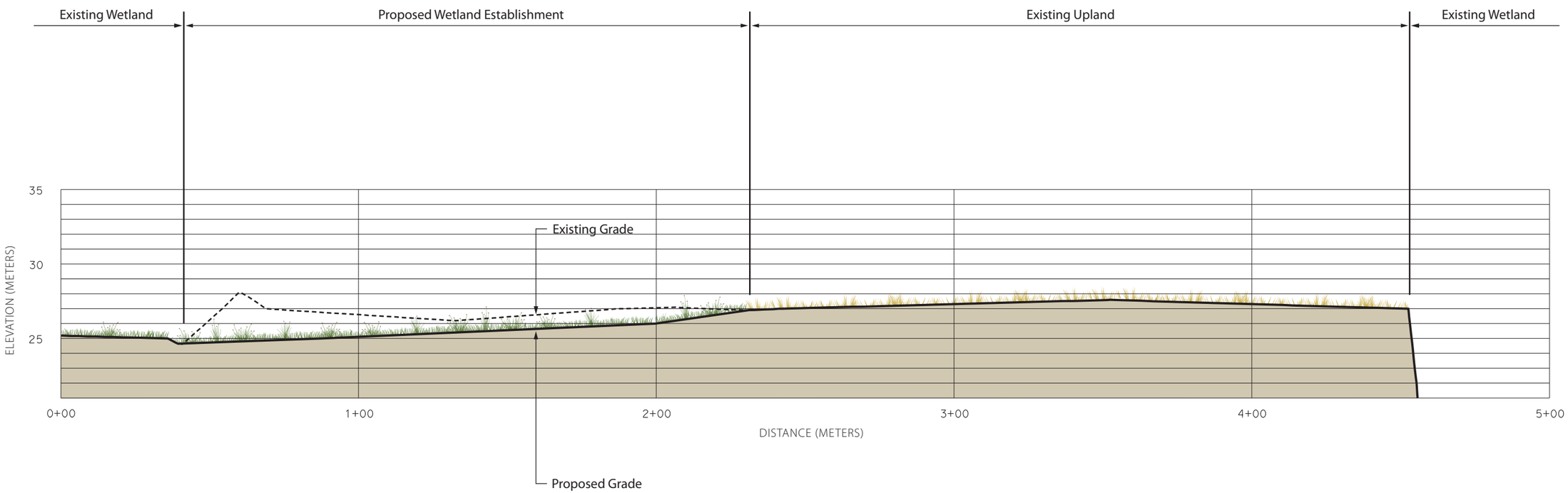
WETLAND REHABILITATION—GRAZED AREAS

Wetland rehabilitation will be accomplished by using rotational grazing to promote the establishment of native wetland species on 44.26 acres (Appendix C and Table 6-5). Grazing management will occur on the majority of this parcel. The exception is in the wetland establishment area, where it will be perpetually excluded. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

7.3.2.3 BENBOW (APN 108-030-07)

The mitigation goals for this parcel are BM rehabilitation and wetland rehabilitation. Wetland rehabilitation will be accomplished by managing grazing on one portion of this parcel and implementing Type 3 rehabilitation actions on another portion of the parcel.

The performance standards for mitigation actions at this Benbow parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.



Notes:

1. Existing grade will be lowered to proposed grade to establish wetland.
2. This graphic is based on grading plans prepared by Caltrans included as Appendix E.

Figure 7-3
Wetland Establishment at Benbow (APN 108-020-06) and Wildlands Parcel (APNs 108-020-07 and 108-060-01)
Willits Bypass Project

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on approximately the northern two thirds of the parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—GRAZED AREAS

Grazing management will occur on 34.32 acres on the northern portion of the parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. Rotational grazing will be used to promote the establishment of native wetland species. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from the southern portion of the parcel and implementing 19.57 acres of Type 3 rehabilitation actions (Appendix C and Table 6-5). Isolated stands of Himalayan blackberry and other nonnative weeds on the west side of the mitigation unit will be targeted for control and removal and replaced with native wetland species.

7.3.2.4 BENBOW (APN 108-040-13)

The mitigation goals for this Benbow parcel are Group 2 wetland establishment, Type 3 wetland rehabilitation, riparian rehabilitation, and other waters rehabilitation. Grazing will be prohibited on this parcel.

The performance standards for mitigation actions at this Benbow parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

WETLAND ESTABLISHMENT

Wetland establishment at this parcel will consist of Group 2 wetland establishment totaling 1.65 acres. Three wet meadow units will be established on this parcel (Appendix C and Table 6-5). The grading and planting plans for offsite wetland establishment are presented in Appendix E. The wetland establishment areas are small inclusions of existing uplands in the wet

meadow complex that will be lowered to match, or be slightly lower than, the elevation of adjacent wetland habitat and will be seasonally saturated or inundated by rainfall and/or groundwater. The NRCS soil survey indicates that the soil unit in all three wetland establishment areas is the same as the adjacent wet meadow.

A soil survey was performed in December 2011 for the largest of the three proposed wetlands. The soil survey results, presented in Appendix O, indicate that the soils at this location are suitable for wetland establishment. The detailed soil evaluation assigned a wetland establishment suitability rating of *high* to this parcel. The soil was inferred to have moderate permeability with loam or light clay loam textures throughout. The soil will be a light clay loam at and just below the planned finish grade and therefore will be suitable for wetland establishment.

The newly graded wetlands will be tied into existing topographic contours. The excess soil from grading will be disposed of offsite. The established wetlands will be seeded and planted with native wetland species.

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from the entire parcel and implementing 32.26 acres of Type 3 rehabilitation actions on all of the existing wet meadow (Appendix C and Table 6-5).

RIPARIAN REHABILITATION

Riparian rehabilitation will be accomplished by excluding cattle from the entire parcel, including the Category III Riparian Corridors adjacent to two unnamed drainages on and near the east side of the parcel.

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from the two drainages and the adjacent Category III Riparian Corridors. An unstable headcut in a seasonal swale also will be stabilized and planted to reduce sedimentation to downstream sources (Appendix C and Table 6-6).

The large headcut located in a swale that is tributary to an intermittent stream will be repaired by placing soil fill to establish a step-pool grade control structure (see mitigation construction plans and special provisions for grading plans). Sediment derived from this headcut likely enters a discontinuous intermittent stream channel that runs along the eastern edge of the parcel. This channel appears to have once been connected to Davis Creek but no longer has an active

hydrologic connection to that creek. As such, potential sediment from this headcut essentially enters an active sediment sink (the discontinuous intermittent stream). Hydrology will be improved by the placement of a step-pool grade control structure to stop the upward migration of the headcut and reduce sedimentation on the parcel. This location takes place in an ungrazed portion of the mitigation project so will be protected from future cattle disturbance.

7.3.2.5 BENBOW (APN 007-010-04)

The mitigation goals for this Benbow parcel are Type 2 and Type 3 wetland rehabilitation, riparian rehabilitation, and other waters rehabilitation. Grazing will be prohibited on this parcel.

The performance standards for mitigation actions at this Benbow parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from the entire parcel and implementing Type 2 and Type 3 rehabilitation actions totaling 23.27 acres (Appendix C and Table 6-5). Type 2 rehabilitation actions (18.57 acres) will be implemented over the majority of the wet meadow. Type 3 rehabilitation actions (4.70 acres) will be implemented in wet meadow adjacent to the riparian corridor on the east side of the parcel.

RIPARIAN REHABILITATION

Riparian rehabilitation will be accomplished by excluding cattle from the entire parcel, including the Category III Riparian Corridor adjacent on the east side of the parcel and the Baechtel Creek (Category I corridor) on the west side of the property.

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Baechtel Creek and the unnamed drainage and the existing riparian vegetation adjacent to the creek and drainage (Appendix C and Table 6-6).

7.3.2.6 BENBOW (APN 007-020-03)

The mitigation goals for this Benbow parcel are Type 2 and Type 3 wetland rehabilitation, riparian rehabilitation, and other waters rehabilitation. Grazing will be prohibited on this parcel.

The performance standards for mitigation actions at this Benbow parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from the entire parcel and implementing Type 2 and Type 3 rehabilitation actions totaling 17.12 acres (Appendix C and Table 6-5). Type 2 rehabilitation actions (11.44 acres) will be implemented over the majority of the wet meadow. Type 3 rehabilitation actions (5.68 acres) will be implemented in wet meadow adjacent to the riparian corridor on the east side of the parcel.

RIPARIAN REHABILITATION

Riparian rehabilitation will be accomplished by excluding cattle from the entire parcel, including Baechtel Creek (Category I corridor) on the west side of the property and the Category III Riparian Corridor on the east side of the parcel.

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Baechtel Creek and the unnamed drainage and the existing riparian vegetation adjacent to the creek and drainage (Appendix C and Table 6-6).

7.3.2.7 BROOKE (APN 108-020-03)

The mitigation goals for this Brooke parcel are oak woodland and riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing has not occurred on this parcel for several years and is not planned.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

OAK WOODLAND ESTABLISHMENT

Oak woodland establishment will be accomplished by planting oaks and other woodland species (e.g., Oregon ash) in areas delineated as mixed marsh (Appendix C). Oak woodland species

have begun to colonize portions of this parcel. The oak woodland planting plan will include species that have colonized this parcel as well woodland species that occur in existing riparian wetland on this parcel

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridor on Mill Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridor on Mill Creek that currently support woody riparian vegetation. Cattle exclusion fencing will not be required because grazing will be prohibited on this parcel.

OTHER WATERS REHABILITATION

Other waters rehabilitation will consist of widening the Category I Riparian Corridor along Mill Creek by planting riparian species adjacent to the existing riparian vegetation (Appendix C and Table 6-6). Cattle exclusion fencing will not be required because grazing will be prohibited on this parcel.

7.3.2.8 BROOKE (APN 038-020-11)

The mitigation goal for this Brooke parcel is other waters rehabilitation and riparian and oak woodland establishment. Grazing has not occurred on this parcel for several years and is not planned.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

OAK WOODLAND ESTABLISHMENT

Oak woodland establishment will be accomplished by planting oaks and other woodland species (e.g., Oregon ash) in areas delineated as mixed marsh (Appendix C). Oak woodland species

have begun to colonize portions of this parcel. The oak woodland planting plan will include species that have colonized this parcel as well woodland species that occur in existing riparian wetland on this parcel

RIPARIAN ESTABLISHMENT

Riparian establishment will occur in a portion of the Category I Riparian Corridor on Mill Creek that currently supports woody riparian vegetation. Cattle exclusion fencing will not be required because grazing will be prohibited on this parcel.

OTHER WATERS REHABILITATION

Other waters rehabilitation will consist of widening the Category I Riparian Corridor along Mill Creek by planting riparian species adjacent to the existing riparian vegetation (Appendix C and Table 6-6). Cattle exclusion fencing will not be required because grazing will be prohibited on this parcel.

7.3.2.9 BROOKE (APN 038-040-09)

The mitigation goal for this Brooke parcel is oak woodland establishment. Grazing has not occurred on this parcel for several years and is not planned.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

OAK WOODLAND ESTABLISHMENT

Oak woodland establishment will be accomplished by planting oaks and other woodland species (e.g., Oregon ash) in areas delineated as mixed marsh (Appendix C). Oak woodland species have begun to colonize portions of this parcel. The oak woodland planting plan will include species that have colonized this parcel as well woodland species that occur in existing riparian wetland on this parcel

7.3.2.10 BROOKE (APN 108-030-01)

The mitigation goal for this Brooke parcel is riparian and other waters rehabilitation and riparian and oak woodland establishment. Grazing has not occurred on this parcel for several years and is not planned.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

RIPARIAN ESTABLISHMENT

Riparian establishment will occur in a portion of the Category I Riparian Corridor on Mill Creek that currently supports woody riparian vegetation. Cattle exclusion fencing will not be required because grazing will be prohibited on this parcel.

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridors on Mill Creek and Upp Creek that currently support woody riparian vegetation. Cattle exclusion fencing will not be required because grazing will be prohibited on this parcel.

OTHER WATERS REHABILITATION

Other waters rehabilitation will consist of widening the Category I Riparian Corridors along Mill Creek and Upp Creek by planting riparian species adjacent to the existing riparian vegetation (Appendix C and Table 6-6). Cattle exclusion fencing will not be required because grazing will be prohibited on this parcel.

OAK WOODLAND ESTABLISHMENT

Oak woodland establishment will be accomplished by planting oaks and other woodland species (e.g., Oregon ash) in areas delineated as mixed marsh (Appendix C). Oak woodland species have begun to colonize portions of this parcel. The oak woodland planting plan will include species that have colonized this parcel as well woodland species that occur in existing riparian wetland on this parcel

7.3.2.11 FORD (APN 108-010-06)

The mitigation goals for this Ford parcel are BM rehabilitation, Group 1 wetland establishment, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

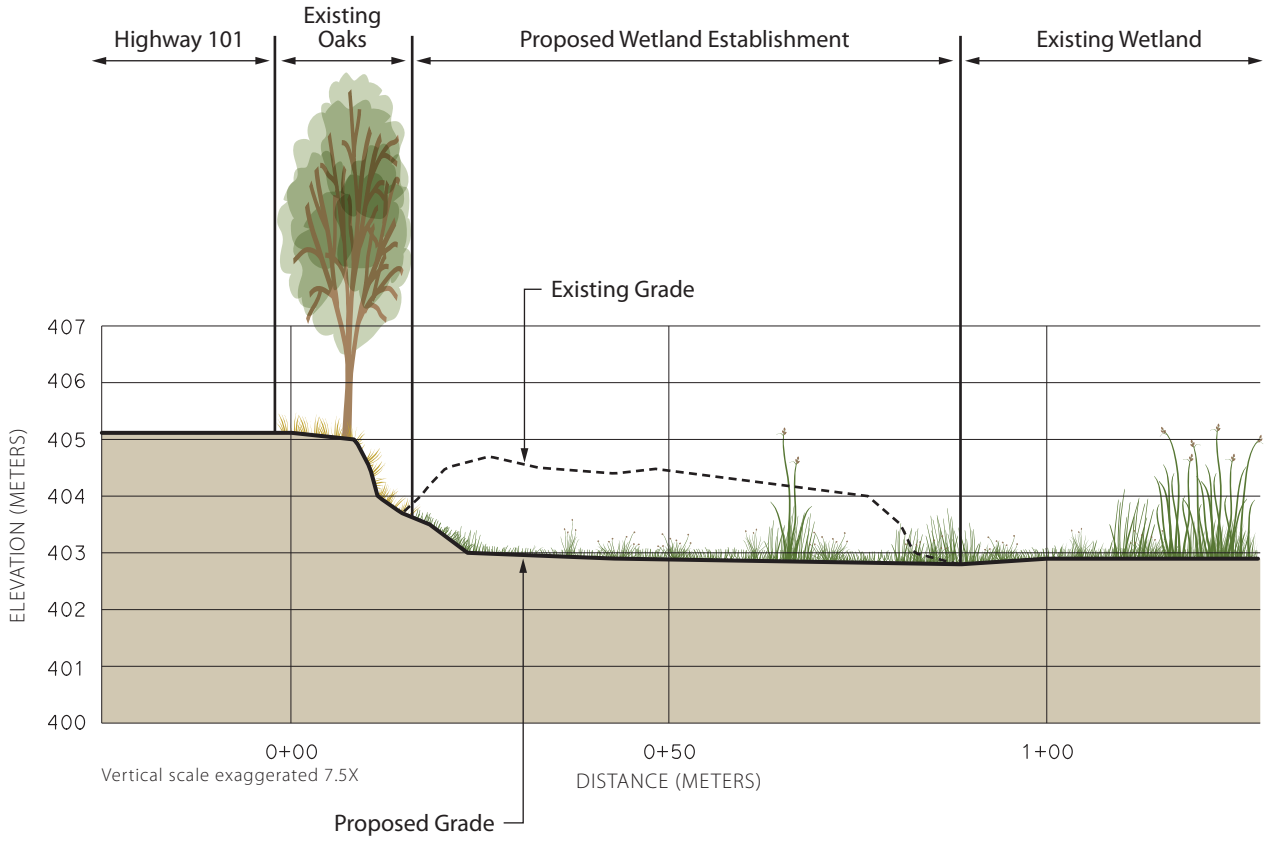
BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

Wetland establishment at this parcel will consist of Group 1 wetland establishment totaling 2.14 acres (Appendix C and Table 6-5). The wet meadow unit will be established adjacent to US 101 (Appendix C). Figure 7-4 is a graphic representation of wetland establishment efforts at the Ford parcel. The grading and planting plans for offsite wetland establishment are presented in Appendix E.

As described in Section 5.3.4.3 in Chapter 5, "Baseline Information," the existing soil at this parcel and in the area to be graded is composed mostly of Haplaquepts (0–1% slopes) and a small area of Pinole gravelly loam (2–8% slopes) alongside US 101. Haplaquepts are very poorly drained soils that are typically clay loam and silty clay loam throughout the profile. Pinole gravelly loam is a well-drained soil made up of gravelly loam from 0 to 10 inches, gravelly clay loam from 10 to 37 inches, and sandy clay loam and gravelly sandy clay loam from 37 to 61 inches depth. Based on a review of the NRCS soil survey and the wetland delineation results for this Ford parcel, existing wet meadow and mixed marsh occur on both the Haplaquept and Pinole soil map units (Wildlands 2008). The Pinole map unit also supports upland habitat. The wetland delineation did not include site-specific soil data points at the wetland establishment site. This parcel remains ponded into the late spring and has saturated soil conditions that provide wetland hydrology. This is evidenced by the existing wetlands that surround the wetland establishment site.



Notes:

1. Existing grade will be lowered to proposed grade to establish wetland.
2. This graphic is based on grading plans prepared by Caltrans included as Appendix E.

Figure 7-4
Wetland Establishment at Ford Parcel (APN 108-010-06)
Willits Bypass Project

As described in Section 5.1.3 in Chapter 5, "Baseline Information," groundwater hydrology in Little Lake Valley is related to the aquifer underlying the valley. The upper portion of the aquifer occurs in alluvium that is composed of silt, clay, gravel, and sand (Farrar 1986). The presence of sheets of fine-grained sediments causes much of the aquifer to be confined or semiconfined. Based on well elevations and the presence of the large marsh at the northern end of Little Lake Valley, it is very likely that the upper portion of the water table is close to the ground surface. Overall in Little Lake Valley, including this parcel, it is difficult to determine with certainty that the water is not perched on impermeable layers located above the main aquifer. If the water is perched, the primary source of water to support the wetlands on this Ford parcel is rainfall (average annual precipitation of 50 inches per year) and surface runoff. If the water represents the upper portion of the main aquifer, the wetlands on the Ford parcel are supported by the aquifer as a whole. In either case, the presence of seasonally ponded wetlands adjacent to the wetland establishment site indicates that water is available for wetland establishment.

Surface hydrology at this Ford parcel appears to be influenced by rainfall, overflow from adjacent drainages, and seasonal high groundwater. Old Outlet Creek and Wild Oat Canyon Creek form the eastern and southern boundaries, respectively, of the existing wetland complex. High flows in the creeks seasonally inundate the wetlands. This wetland complex also occurs in the northern portion of Little Lake Valley where a lake historically formed during the rainy season, even during very low rainfall years (Dean 1920). As part of wetland establishment actions at the Ford parcel, current hydrology will be altered to allow greater overland flow from an artificial drainage adjacent to the wetland establishment site.

Wetland establishment will be accomplished by grading an upland overburden area adjacent to existing wet meadow and mixed marsh habitat in the northeast corner of the parcel to establish additional wet meadow habitat. The established wetland will be tied into existing topographic contours and will be excavated (by 0 to 6.17 feet) to a grade comparable to adjacent wetlands to provide seasonal inundation to a depth of 6–12 inches. No topsoil importation is planned for the wetland, as existing topsoil from the graded area will be harvested (approximately the top 4 inches) and stockpiled for later use in topdressing the established wetland. The use of existing topsoil to topdress the established wetland, which is dominated by upland species, will not result in the reintroduction of nonnative upland species because the established wetland hydrology will preclude establishment of nonnative upland species. Topsoil will be stockpiled in upland areas outside ESA boundaries.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 108.75. acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by implementing 1.32 acres of Type 5 rehabilitation actions on portions of Outlet Creek (Appendix C and Table 6-5).

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridors on Outlet Creek and Old Outlet Creek, and the Category II corridor on Wild Oat Canyon Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridors on Outlet Creek and Old Outlet Creek and the Category II corridor on Wild Oat Canyon Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Outlet Creek, Old Outlet Creek, and Wild Oat Canyon Creek; excluding cattle from existing riparian vegetation in the riparian corridors; widening the riparian corridors by planting additional riparian vegetation; and repairing the eroding bank sections along Outlet Creek (Appendix C and Table 6-6).

Other waters rehabilitation will be accomplished by widening the Category I Riparian Corridor of Outlet Creek and Old Outlet Creek, widening the Category II Riparian Corridor on Wild Oat

Canyon Creek, and permanently excluding livestock from all Category I and II Riparian Corridors (Appendices C and E, Table 6-6).

Three instream eroding bank sections on Outlet Creek in the center of the parcel will be repaired (Appendices C and E). The grading and planting plans for these locations are presented in Appendix E. All three sites have unstable, mostly vegetated cut banks created by convergence flow on the riffle/gravel bar complex on the opposite side of the cut bank. The banks are approximately 6 feet tall and actively slumping. These areas will be repaired by grading back the vertical bank (which in turn will decrease shear stress on the bank), planting native riparian vegetation (which will stabilize the banks through increased ground cover and root density), and incorporating instream structures at the toe slope (which may establish instream aquatic habitat in the form of lateral scour pools that can support listed fish species and other aquatic organisms). See the erosion site assessment in Appendix N for repair concepts for these eroding banks. These sites are located in a riparian area that will be fenced to exclude cattle, so they will be protected from future cattle disturbance.

7.3.2.12 FORD (APN 108-020-04)

The mitigation goals for this Ford parcel are BM rehabilitation, Group 2 wetland establishment, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

Wetland establishment at this parcel will consist of Group 2 wetland establishment totaling 6.48 acres (Appendix C and Table 6-5). The established wetland footprint will extend from the north end of this parcel south onto the adjacent Ford parcel (APN 108-030-02). The grading and

planting plans for offsite wetland establishment are presented in Appendix E. Figure 7-5 is a graphic representation of wetland establishment efforts at these parcels.

The wetland establishment area is an area of upland between a wet meadow complex and the riparian corridor. The upland appears to be composed of both a low, natural levee and fill material placed to widen the natural levee.

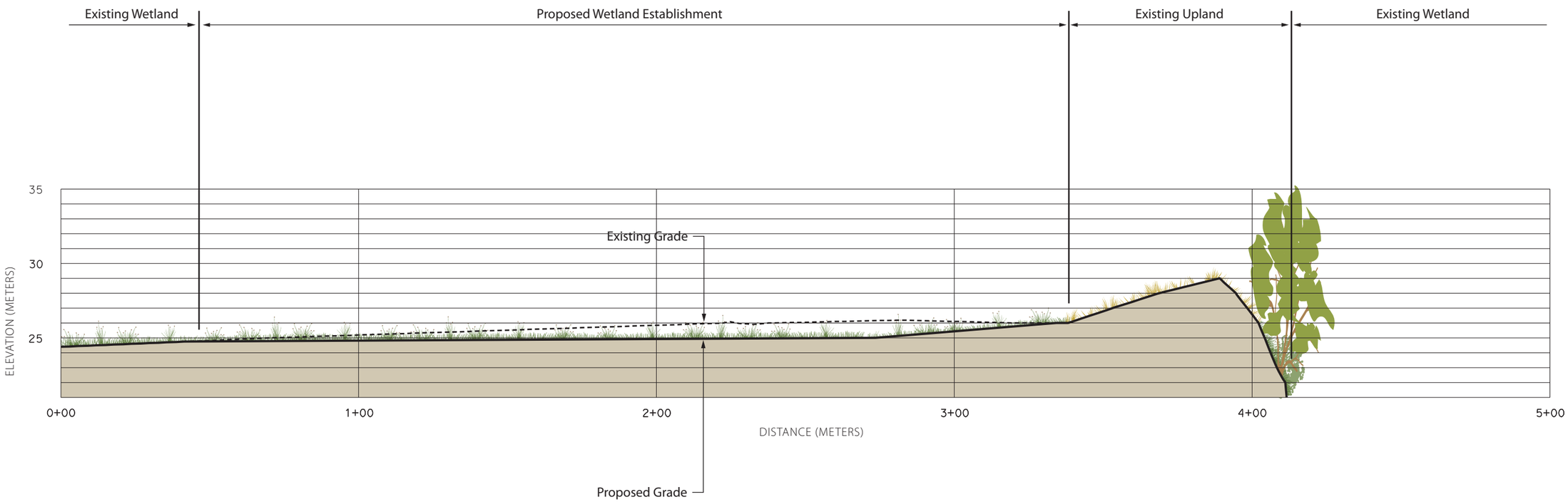
Wetland grading will consist of lowering a portion of this upland to match, or be slightly lower than, the elevation of the adjacent wet meadow located to the west. The wetland establishment area is expected to support wet meadow because the established wetland will share surface and groundwater characteristics similar to those of the existing wet meadow (i.e., it will be seasonally saturated or inundated by rainfall and/or is subject to a seasonal shallow groundwater table). The newly graded wetlands will be tied into existing topographic contours. The excess soil from grading will be disposed of offsite. The established wetlands will be seeded and planted with native wetland species.

Preliminary and detailed soil evaluations were performed on this parcel by a soil scientist in August and December 2011, respectively. A geomorphologist also participated in the survey to evaluate the condition of the existing land surface and its feasibility for establishing wetlands.

Seven shallow pit soil profiles (preliminary soil evaluation) were described—four placed in existing uplands, and the remaining three located in the adjacent wet meadow to serve as reference areas. The soil profile and site description forms are provided in Appendix O. The evaluation results indicated that the soil type and range of soil characteristics in the proposed wetland establishment area are similar to the range of soils in the adjacent wet meadow.

Seven backhoe pit profiles (detailed soil evaluation) were described, all of which were placed in existing uplands. The soils in this parcel were assigned a wetland establishment suitability rating ranging from *low-medium* to *high*. Some of the soils were inferred to have moderate permeability at or just below finish grade (for example, profile Q), and therefore suitable for wetland establishment. However, profiles N and O contained loamy sand or very gravelly sand layers that would exist at or just below the planned finish grade elevation. Such layers were determined to be excessively permeable, such that wetlands established in and near these locations could be subject to excessive lateral movement of in-profile water toward Outlet Creek.

Consequently, the grading plan that covers this parcel was revised to exclude areas in the vicinity of profiles N and O from the proposed mitigation.



Notes:

1. Existing grade will be lowered to proposed grade to establish wetland.
2. This graphic is based on grading plans prepared by Caltrans included as Appendix E.

Figure 7-5
Wetland Establishment at Ford Parcel (APN 108-020-04)
Willits Bypass Project

Wetland inundation surveys were performed at the offsite mitigation parcels during December 2010 through May 2011. Based on preliminary inundation survey results, reported in a baseline report prepared by Caltrans (2011), the majority of the adjacent wetland was inundated for at least 1 month with some areas ponded for 2 months. Approximately one half of the uplands proposed for wetland establishment also were inundated for at least 1 month. The wetland inundation surveys did not assess soil saturation, but it is presumed that some of the upland soils also may have been saturated for an extended period of time during the winter of 2010–2011. The wetland inundation maps of the offsite mitigation parcels are presented in Appendix H.

The proposed establishment site also was surveyed by a geomorphologist to evaluate the condition of the land surface and its feasibility for establishing wetlands. The eastern extent of this established wetland will be approximately 75 feet from the top of bank on Outlet Creek. Based on the proposed grading limit, it was determined that the proposed grading area would not encroach on, lower, or impair the existing natural levee. The geomorphologist also evaluated the area for the potential for overbank flow and sediment deposition. Based on this assessment, the extreme north end of the proposed wetland area was dropped from consideration. The proposed wetland boundary reflects this assessment.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 85.44 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from portions of the parcel and implementing Type 3, Type 4, and Type 5 rehabilitation actions totaling 27.58 acres (Appendix C and Table 6-5). Type 3 rehabilitation actions (16.56 acres) will be implemented at two locations, one on the west side and one on the east side of the parcel. Type 4 rehabilitation actions (10.31 acres) will be implemented in wet meadow in the southwest portion of the parcel. Type 5 rehabilitation actions (0.71 acre) will be implemented on a long portion of Outlet Creek at the far northeast corner.

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridors on Outlet Creek and Old Outlet Creek that currently do not support woody riparian vegetation. The

locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridors on Outlet Creek and Old Outlet Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Outlet Creek and Old Outlet Creek, excluding cattle from existing riparian vegetation in the riparian corridors, and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.13 FORD (APN 108-030-02)

The mitigation goals for this Ford parcel are BM rehabilitation, Group 2 wetland establishment, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on a portion of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on a portion of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

Wetland establishment at this parcel will consist of Group 2 wetland establishment totaling 1.86 acres (Appendix C and Table 6-5). The established wetland footprint will extend from this parcel to the north end of the adjacent Ford parcel (APN 108-020-04). Figure 7-5 is a graphic representation of wetland establishment efforts at these parcels. The wetland establishment area is an area of upland between a wet meadow complex and the riparian corridor. The grading and planting plans for offsite wetland establishment are presented in Appendix E.

Preliminary and detailed soil evaluations were performed on the parcel by a soil scientist in August and December 2011, respectively. A geomorphologist also participated in the survey to evaluate the condition of the existing land surface and its feasibility for establishing wetlands.

Five shallow soil pit profiles (preliminary soil evaluation) were described—four placed in existing uplands, and the remaining pit located in the adjacent wet meadow to serve as a reference area. The soil profile and site description forms are provided in Appendix O. The evaluation results indicated that with the exception of pits 1b, 2b, and 4b, the soil type and range of soil characteristics in the proposed wetland establishment area are similar to the range of soils in the adjacent wet meadow.

Five backhoe pit profiles (detailed soil evaluation) were described, all of which were placed in existing uplands. Soils in this parcel were assigned wetland establishment suitability ratings ranging from *low* to *high*. Some of the soils were inferred to have moderate permeability at or just below finish grade (for example, profile V) and therefore suitable for wetland establishment. However, profiles Y, 1b, 2b, and 4b contained loamy sand and pebbly layers that would exist at or just below the planned finish grade elevation. Such layers were determined to be excessively permeable, such that wetlands established in and near these locations could be subject to excessive lateral movement of in-profile water toward Outlet Creek.

Consequently, the grading plan that covers this parcel was revised to exclude areas in the vicinity of profiles Y, 1b, 2b, and 4b from the proposed mitigation.

The proposed establishment site also was surveyed by a geomorphologist to evaluate the condition of the existing land surface and its feasibility for establishing wetlands. The eastern extent of this established wetland will be approximately 75 feet from the top of bank on Outlet Creek. Based on the proposed grading limit, it was determined that the proposed grading area would not encroach on, lower, or impair the existing natural levee. The geomorphologist also evaluated the area for the potential for overbank flow and sediment deposition; no concerns were identified.

Wetland inundation surveys were performed at the offsite mitigation parcels during December 2010 through May 2011. Based on preliminary inundation survey results, reported in a baseline report prepared by Caltrans (2011), the majority of the adjacent wetland was inundated for at least 1 month with some areas ponded for 2 months. Approximately one half of the uplands proposed for wetland establishment also were inundated for at least 1 month. The wetland inundation surveys did not assess soil saturation, but it is presumed that some of the upland soils also may have been saturated for an extended period of time during the winter of 2010–2011. The wetland inundation maps for the offsite mitigation parcels are presented in Appendix H.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 8.81 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from most of the parcel and implementing Type 3 and Type 4 rehabilitation actions totaling 27.71 acres (Appendix C and Table 6-5). Type 3 rehabilitation actions (13.05 acres) will be implemented in wet meadow on the west side of the parcel, and Type 4 rehabilitation actions (14.66 acres) will be implemented in wet meadow on the east side of the parcel.

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridors on Outlet Creek and Old Outlet Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridors on Outlet Creek and Old Outlet Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Outlet Creek and Old Outlet Creek, and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.14 FORD (APN 108-010-05)

The mitigation goals for this Ford parcel are BM rehabilitation, wetland, other waters, and riparian rehabilitation and riparian establishment.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 65.08 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation in this area will be accomplished by removing grazing and implementing 6.44 acres of Type 5 rehabilitation actions within the Category I Riparian Corridor of Davis Creek on the south side of the parcel (Appendix C and Table 6-5).

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in the Category I Riparian Corridor on Davis Creek, downstream of the Type 5 wetland rehabilitation area, which currently does not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in a small portion of the Category I Riparian Corridor on Davis Creek that currently supports woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Davis Creek, excluding cattle from existing riparian vegetation in the riparian corridors, and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.15 FORD (APN 108-030-05)

The mitigation goals for this Ford parcel are Type 3 wetland rehabilitation, riparian establishment, riparian rehabilitation and other waters rehabilitation. Grazing will be prohibited on this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from the entire parcel and implementing 61.75 acres of Type 3 rehabilitation actions (Appendix C and Table 6-5).

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridor on Outlet Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridor on Outlet Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Outlet Creek, excluding cattle from existing riparian vegetation in the riparian corridors, and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.16 FROST (APN 108-070-04)

The mitigation goals for this parcel are NCSG and BM rehabilitation, wetland rehabilitation, and other waters rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

NORTH COAST SEMAPHORE GRASS REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of NCSG (Appendix C and Figure 5-8). Grazing management will occur on a majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. A small population of NCSG occurs along the fence line on the east side of the parcel. The grazing management for this parcel is described in the grazing plan (Appendix Q).

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on a majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. Several small populations of BM occur along the fence line on the east side of the parcel. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 41.34 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by repairing a complex of headcuts in the northeast corner of the parcel to reduce sedimentation to Berry Creek (Appendix C). These sites are located in a riparian area that will be fenced to exclude cattle so they will be protected from future cattle disturbance.

Five headcuts are located near the northeast corner of the parcel. Three of these are instream headcuts on a small unnamed tributary to Berry Creek and two are upland headcuts. The headcuts appear to be unstable and have high potential to contribute sediment to Berry Creek via the unnamed tributary. These sites will be repaired by placing soil fill to establish a step-pool grade control structure (see mitigation construction plans and special provisions for grading plans). Hydrology will be improved by reducing sedimentation to Berry Creek. The rehabilitation areas will be seeded and planted with native species. The grading and planting plans for the headcut repair areas are presented in Appendix E.

7.3.2.17 GOSS (APN 103-230-02)

The mitigation goals for this parcel are NCSG and BM rehabilitation, Group 1 wetland establishment, and wetland rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term

management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

NORTH COAST SEMAPHORE GRASS REHABILITATION

Rotational grazing will be used to maintain or improve NCSG populations (Appendix C and Figure 5-7). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q). Woody shrub and vine species will be removed as they occur in or near NCSG populations to prevent competition with NCSG.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on a majority of this parcel (Appendix C). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. Several small populations of BM occur along the fence line on the east side of the parcel. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

A Group 1 wetland, totaling 7.47 acres, will be established that will span portions of three parcels: Goss, MGC Plasma Middle, and MGC Plasma North (Appendix C and Table 6-5). Wetland establishment for this mitigation unit is discussed in detail in Section 7.3.2.24, MGC Plasma Middle. The grading and planting plans for offsite wetland establishment are presented in Appendix E.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 8.16 acres of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

7.3.2.18 HUFF (APN 037-240-RW)

The mitigation goals for this parcel are wetland preservation and other waters preservation. Grazing did not occur on this parcel previously and is not planned in the future. Caltrans will construct exclusion fencing to prohibit unauthorized access to this parcel.

A small population of BM is present at this site but is not included in the mitigation credit calculations because CDFG has indicated that BM will die out without grazing. This population has existed thus far without grazing; however, in light of CDFG's position and the inability to graze the parcel because of its inaccessibility, Caltrans did not consider the population part of the preservation credit.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

WETLAND AND OTHER WATERS PRESERVATION

The Huff parcel supports wetland and other waters habitat. Grazing will not occur on this parcel because it is inaccessible; it is bounded on all sides by a railroad alignment, US 101, and Outlet Creek. Caltrans will install exclusion fence or other exclusion methods to prohibit unauthorized use of this parcel.

7.3.2.19 HUFFMAN (APN 108-040-08)

The mitigation goal for this parcel is NCSG habitat establishment and wetland rehabilitation. Grazing may be retained on this parcel; however, another land management action (e.g., mowing) may be more appropriate because of the small parcel size and difficult access.

The performance objectives for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Because this is an experimental action, quantitative performance standards have not been assigned and no remedial actions are required. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Other sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

NORTH COAST SEMAPHORE GRASS ESTABLISHMENT

This parcel currently supports NCSG populations. The existing NCSG populations are shown on Figure 5-9. The NCSG establishment area is shown on Appendix C. The mitigation activities on this parcel will include transplanting salvaged NCSG from the permanent impact areas in the bypass alignment, seeding with NCSG seed collected on the Huffman parcel, and planting container stock grown from seeds collected on the Huffman parcel. Caltrans also will develop a management approach to maintain the NCSG populations on this parcel.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species as well as NCSG. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

7.3.2.20 LUSHER (APN 108-030-03)

The mitigation goals for this parcel are BM rehabilitation, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—GRAZED AREAS

Grazing management will occur on 11.37 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. Rotational grazing will be used to promote the establishment of native wetland species. The grazing management for this parcel is described in the grazing plan (Appendix Q).

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridors on Mill Creek and Upp Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation

of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridors on Mill Creek and Upp Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Mill Creek and Upp Creek, excluding cattle from existing riparian vegetation in the riparian corridors, and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.21 LUSHER (APN 038-060-08)

The mitigation goals for this parcel are wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing is not planned on this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing and implementing Type 3 mitigation. (Appendix C). The majority of this parcel is in the bypass project footprint. As a result, there is only a small area of wet meadow outside of the bypass on the west side of Upp Creek. This area will be inaccessible to cattle; therefore, it will not be grazed.

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridor on Upp Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridor on Upp Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Upp Creek, excluding cattle from existing riparian vegetation in the riparian corridors, and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.22 LUSHER (APN 108-030-04)

The mitigation goals for this parcel are NCSG rehabilitation, Group 2 wetland establishment, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on a portion of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

NORTH COAST SEMAPHORE GRASS REHABILITATION

Rotational grazing will be used to maintain or improve NCSG populations (Figure 5-10). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q). Woody shrub and vine species will be removed as they occur in or near NCSG populations to prevent competition with NCSG.

WETLAND ESTABLISHMENT

Wetland establishment at this parcel will consist of Group 2 wetland establishment totaling 5.22 acres (Appendix C and Table 6-5). The grading and planting plans for offsite wetland establishment are presented in Appendix E. Figure 7-6 is a graphic representation of wetland establishment efforts at this parcel. The wetland establishment area is an area of upland between a wet meadow complex and the riparian corridor.

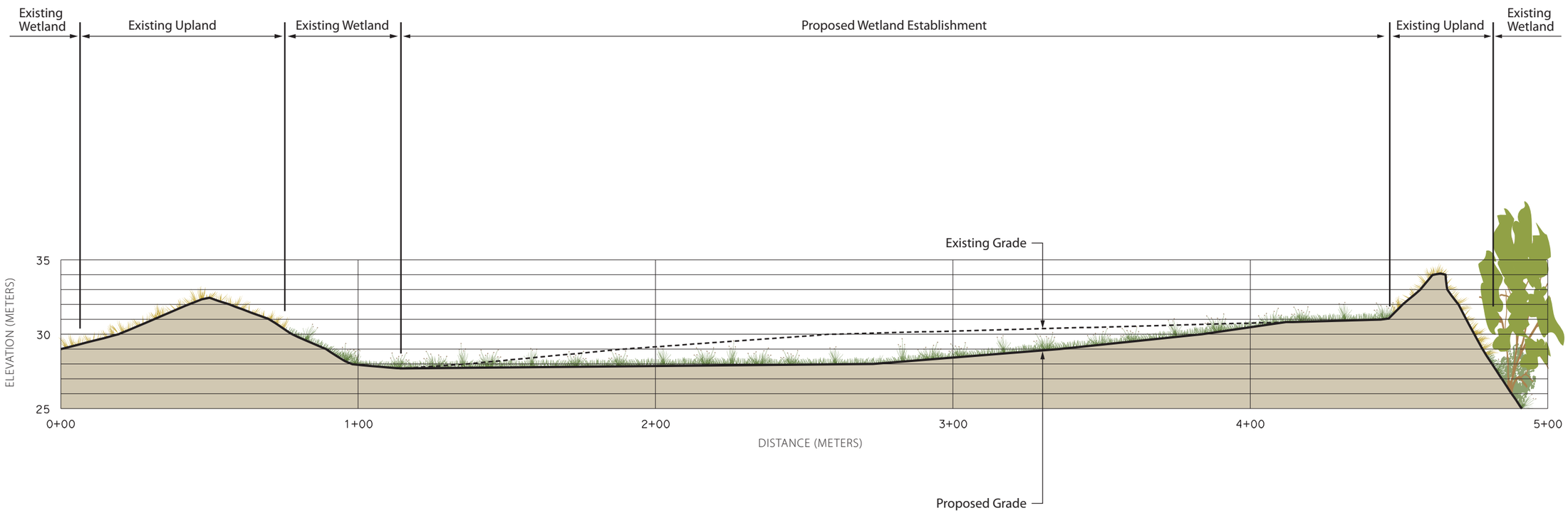
Wetland grading will consist of lowering a portion of this upland to match, or be slightly lower than, the elevation of the adjacent wet meadow located to the west. The wetland establishment area is expected to support wet meadow because the established wetland will share surface and groundwater characteristics similar to those of the existing wet meadow (i.e., it will be seasonally saturated or inundated by rainfall and/or is subject to a seasonal shallow groundwater table). The newly graded wetlands will be tied into existing topographic contours. The excess soil from grading will be disposed of offsite. The established wetlands will be seeded and planted with native wetland species.

Preliminary and detailed soil evaluations were performed on the parcel by a soil scientist in August and December 2011, respectively. A geomorphologist also participated in the survey to evaluate the condition of the existing land surface and its feasibility for establishing wetlands.

Four shallow soil pit profiles were described—three placed in existing upland, and the remaining pit located in the adjacent wet meadow to serve as reference area. The soil profile and site description forms are provided in Appendix O. The survey results indicate that the soil type and range of soil characteristics in the proposed wetland establishment area are similar to the range of soils in the adjacent wet meadow.

Five backhoe pit profiles (detailed soil evaluation) were described—four placed in existing uplands, and the remaining pit (CC) located at the base of the natural levee along Outlet Creek to provide information on the continuity with highly permeable layers observed in pit BB. Soils in this parcel were assigned suitability ratings ranging from *low-medium* to *high*. Some of the profiles were inferred to have moderate permeability at or just below finish grade (for example, profile Z) and therefore suitable for wetland establishment. However, profiles AA and BB contained continuous gravelly sand, fine loamy sand, and very gravelly sand layers that would exist at or just below the planned finish grade elevation. Such layers were determined to be excessively permeable, such that wetlands established in and near these locations could be subject to excessive lateral movement of in-profile water toward Outlet Creek. Consequently, the grading plan that covers this parcel was revised to exclude areas in the vicinity of profiles AA and BB from the proposed mitigation.

Wetland inundation surveys were performed for the offsite mitigation parcels during December 2010 through May 2011. Based on preliminary inundation survey results reported in a baseline report prepared by Caltrans (2011), the portions of the adjacent wetland were inundated for 2 to 4 months. Portions of the uplands proposed for wetland establishment were inundated for at least 1 to 2 months. The wetland inundation surveys did not assess soil saturation, but it is presumed that some of the upland soils also may have been saturated for an extended period of time during



Notes:

1. Existing grade will be lowered to proposed grade to establish wetland.
2. This graphic is based on grading plans prepared by Caltrans included as Appendix E.

Figure 7-6
Wetland Establishment at Lusher Parcel (APN 108-030-04)
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the winter of 2010–2011. The wetland inundation maps for the offsite mitigation parcels are presented in Appendix H.

The proposed establishment site also was surveyed by a geomorphologist to evaluate the condition of the existing land surface and its feasibility for establishing wetlands. It was determined that the proposed grading area would not encroach on, lower, or impair the existing natural levee. The geomorphologist also evaluated the area for the potential for overbank flow and sediment deposition; no concerns were identified.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 9.02 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from portions of the parcel and implementing 18.04 acres of Type 3 rehabilitation (Appendix C and Table 6-5). Type 3 wetland rehabilitation will include planting wetland and riparian species in existing wet meadow.

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridors on Outlet Creek, Old Outlet Creek, and Mill Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridors on Outlet Creek, Old Outlet Creek, and Mill Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Outlet Creek, Old Outlet Creek, and Mill Creek; excluding cattle from existing riparian vegetation in the riparian corridors; and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6). Two unstable headcuts in a seasonal swale also will be reestablished and planted to reduce sedimentation to downstream sources. Appendix E presents the grading and planting plans for the headcut repair areas.

The two instream headcuts are located on a short unnamed tributary to Old Outlet Creek. The instream headcuts appear unstable with high potential for sediment to enter Old Outlet Creek. These two headcuts will be repaired by placing soil fill to establish a step-pool grade control structure (see mitigation construction plans and special provisions for grading plans). Hydrology will be improved by reducing sedimentation to Old Outlet Creek. These sites are located in a riparian area that will be fenced to exclude cattle access so they will be protected from future cattle disturbance.

7.3.2.23 MGC PLASMA NORTH (APN 103-230-06)

The mitigation goals for this parcel are NCSG and BM rehabilitation, Group 1 wetland establishment, and wetland rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

NORTH COAST SEMAPHORE GRASS REHABILITATION

Rotational grazing will be used to maintain or improve NCSG populations (Appendix C and Figure 5-7). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q). Woody shrub and vine species will be removed as they occur in or near NCSG populations to prevent competition with NCSG.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support

rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

A Group 1 wetland, totaling 7.47 acres, will be established that will span portions of three parcels: Goss, MGC Plasma Middle, and MGC Plasma North (Appendix C and Table 6-5). Wetland establishment for this mitigation unit is discussed in detail in Section 7.3.24, MGC Plasma Middle. The grading and planting plans for offsite wetland establishment are presented in Appendix E.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 2.68 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

7.3.2.24 MGC PLASMA MIDDLE (APN 103-250-14)

The mitigation goals for this parcel are Group 1 wetland establishment and wetland rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

WETLAND ESTABLISHMENT

The details of wetland establishment for the Goss and MGC Plasma North parcels are discussed in this section because the proposed wetland spans portions of all three parcels. The other mitigation actions (wetland rehabilitation) refer to only the MGC Plasma Middle parcel.

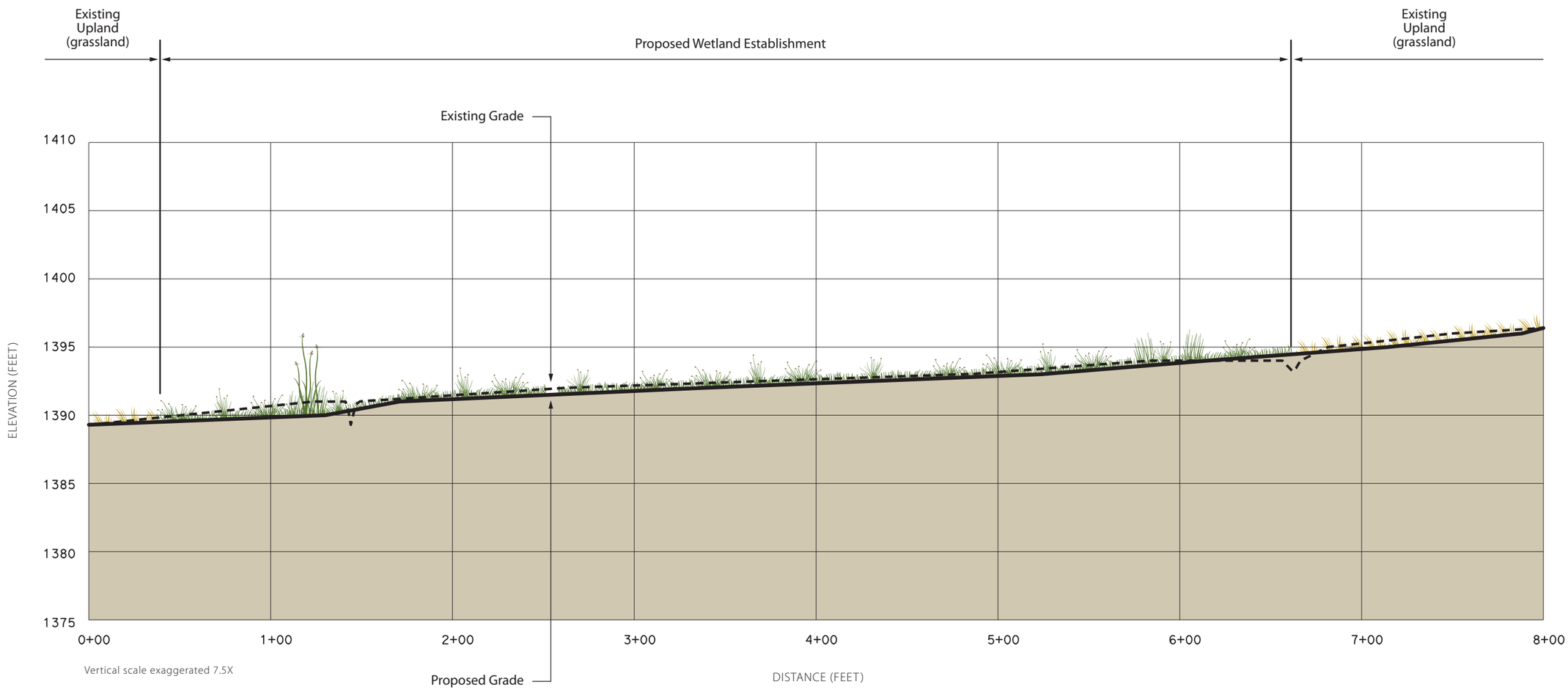
Wetland establishment at MGC Plasma (Middle and North parcels) and Goss offsite mitigation parcels will consist of Group 1 wetland establishment totaling 7.47 acres (Appendix C and Table 6-5). This wetland will span portions of all three parcels. Figure 7-7 is a graphic representation of wetland establishment efforts at the MGC Plasma/Goss parcels. The grading and planting plans for offsite wetland establishment are presented in Appendix E.

As described in Section 5.3.10.3 in Chapter 5, "Baseline Information," the soils at these parcels and in the area to be graded are composed of Gielow sandy loam (0–5% slopes), Cole clay loam (0–2% slopes), and Clear Lake clay (0–2% slopes). Gielow sandy loam is a somewhat poorly drained soil with sandy loam from 0 to 4 inches, loam from 4 to 11 inches, and stratified sandy to clay loam from 11 to 60 inches deep. Cole clay loam is a somewhat poorly drained soil with clay loam from 0 to 8 inches, silty clay from 41 to 60 inches, and silty clay loam from 41 to 60 inches depth. Clear Lake clay is a poorly drained soil with clay from 0 to 49 inches and clay loam from 49 to 65 inches depth. The soil's moderate or slow permeability and poor drainage allow seasonal inundation and saturated soil conditions during the rainy season, thereby providing conditions for wetland hydrology. This is evidenced by the existing wetlands that surround the wetland establishment site.

As described in Section 5.1.3, groundwater hydrology in Little Lake Valley is related to the aquifer underlying the valley. The upper portion of the aquifer occurs in alluvium that is composed of silt, clay, gravel, and sand (Farrar 1986). The presence of sheets of fine-grained sediments causes much of the aquifer to be confined or semiconfined. Overall in Little Lake Valley, including these parcels, it is difficult to determine with certainty that the water is not perched on impermeable layers located above the main aquifer. If the water is perched, the primary source of water to support the wetlands on these parcels is rainfall (average annual precipitation of 50 inches per year) and surface runoff. If the water represents the top of the main aquifer, the wetlands on these parcels are supported by the aquifer as a whole. In either case, the presence of seasonally saturated wetlands adjacent to the established wetland site indicates that water is available for wetland establishment.

Test pits were dug, and groundwater monitoring wells have been installed at the MGC Plasma North/Goss parcels as part of studies related to NCSG (California Department of Transportation 2010). The test pits, dug during March 2010, generally found water within 10 inches of the soil surface. The monitoring wells found water within 12 inches of the soil surface during April 2010 and within 29 inches of the soil surface during May 2010, indicating that water levels remain close to the soil surface through a large portion of the spring. The results from the test pits and groundwater monitoring wells indicate that water likely would be present in the wetlands through May during wet years. Results from the wetland delineation surveys indicate that during drier years the wetlands may be dry as early as May. This timeframe is appropriate for hydrology to support wet meadow.

Surface hydrology at these parcels and in the area to be graded includes artificial drainages that drain water from the parcels into adjacent streams and other drainages. On the Goss parcel, hydrology is influenced by a series of artificial drainages apparently intended to drain sufficient



Notes:

1. Existing grade will be lowered to proposed grade to establish wetland.
2. This graphic is based on grading plans prepared by Caltrans included as Appendix E.

Figure 7-7
Wetland Establishment at MGC Plasma Middle and North Parcels (APN 103-230-06) and Goss Parcel (APN 103-230-02)
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surface water away from the center of the parcel to enable hay production and livestock grazing. These drainages form the western, southern, and eastern boundaries of the parcel, generally directing surface water flows from south to northwest. An additional artificial drainage bisects the parcel, draining surface water from southeast to northwest, and includes a corrugated metal culvert that allows equipment to access the south end of the parcel for mowing. It appears that excavation of this feature has allowed the northeast corner of the Goss parcel to develop into or to remain upland.

As part of wetland establishment actions at the Goss parcel, the surface water hydrology will be altered. Artificial drainages, ranging from approximately 6 inches to 1 foot deep, will be regraded into wider, shallower swales. The swales will continue to drain water in the same direction but will reduce runoff times and increase the residence time of water on the parcel. Additionally, some of the surface flow in the swales will be redirected into established depressional wetlands that will be located adjacent to the swales and to the existing wet meadow complex. Areas of slightly higher elevations will be lowered to tie together the existing swales and established swales. One large swale wetland complex will be established.

On the MGC Plasma parcels, a remnant stream channel is apparent that likely flowed through the two MGC Plasma parcels from southeast to northwest. As part of wetland establishment actions at the MGC Plasma parcels, the current hydrology will be altered. Artificial drainages, ranging from approximately 6 inches to 1 foot deep, occur at several locations on these parcels and will be regraded into wider, shallower swales or converted to wet meadow. The swales will continue to drain water in the same direction but will reduce runoff times and increase the residence time of water on the parcel.

Wetland establishment will be accomplished by grading uplands adjacent to existing wet meadow to establish additional wet meadow habitat. The newly graded wetland will be tied into existing topographic contours. The established wetland will be excavated to a depth comparable to adjacent wetlands (average range of 0 to 1.16 feet). No topsoil importation is planned for the wetland because existing topsoil from the graded area will be harvested (approximately the top 4 inches) and stockpiled for later use in topdressing the established wetland. Topsoil will be stockpiled in upland areas outside ESA boundaries. The excess soil from grading will be disposed of offsite.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 0.35 acre of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water

troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from two existing wet meadows on the east side of the parcel and implementing 1.28 acres of Type 4 rehabilitation actions (Appendix C and Table 6-5).

7.3.2.25 NANCE (APN 108-050-06)

The mitigation goals for the Nance parcel are BM rehabilitation, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 69.01 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from and widening the riparian corridors adjacent to Berry Creek (a Category I stream) by implementing 3.49 acres of Type 5

rehabilitation (Appendix C and Table 6-5). Native riparian vegetation will be planted in the riparian corridor.

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridor on Berry Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category on Berry Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from the riparian corridor and widening the riparian corridor by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Berry Creek, excluding cattle from existing riparian vegetation in the riparian corridor, and widening the riparian corridor by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.26 NIESEN (APN 108-040-02)

The mitigation goals for the Niesen parcel are BM rehabilitation, Group 1 wetland establishment, wetland rehabilitation, riparian establishment, riparian rehabilitation. Grazing will be retained on approximately one half of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support

rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

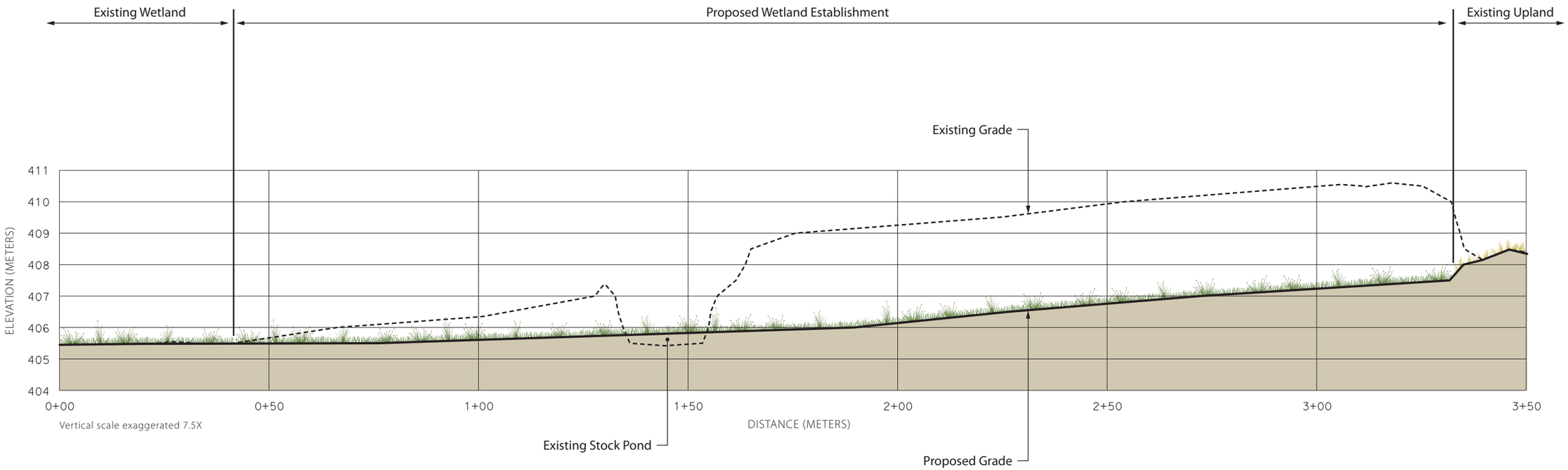
Wetland establishment at the Niesen parcel will consist of Group 1 wetland establishment totaling 5.12 acres (Appendix C and Table 6-5). The wet meadow will be established adjacent to US 101. The grading and planting plans for offsite wetland establishment are presented in Appendix E. Figure 7-8 is a graphic representation of wetland establishment efforts at this parcel.

Wetland establishment will be accomplished by grading an upland overburden area to match the elevation of adjacent wet meadow habitat and establish additional wet meadow habitat. The newly graded wetland will be tied into existing topographic contours. The established wetland will be excavated to a depth comparable to adjacent wetlands to provide seasonal soil saturation. The depth of excavation will range from 0 to approximately 12 feet.

A soil scientist conducted a soil evaluation to determine proposed wetland establishment site suitability in July 2010. Soil pits were excavated at the wetland establishment site, the adjoining existing wetlands, and near the wetland reference monitoring site. Soil pits at the wetland establishment site were excavated to a depth below the proposed wetland soil surface elevation. Appendix O includes a memorandum (dated August 10, 2010) that presents the results of the soil evaluation for the Niesen parcel, as well as the other Group 1 wetland establishment areas.

The evaluation of existing wetlands that occur adjacent to the wetland establishment site indicates that the existing wetlands occur on an overall planar alluvial fan and alluvial plain. The wetlands exist below the elevated “bench” of the establishment site. Based on the five pit excavations made in the existing wetlands, the subsoils are mostly clay loam; one had a clay subsoil in which the upper boundary is 12 inches beneath the surface. All of the soils had redox features beginning within 3 inches of the surface (Appendix O), and all had redox features in the subsoil, suggesting the presence of a seasonal high water table. The existing wetlands appear to be sustained primarily by a high water table.

Gravelly to loamy fill material, ranging from 6 to 99 inches thick, was observed in most of the pits excavated in the upland overburden present at the wetland establishment site (Appendix O). Two pits had fill material mixed into the surface layer of the native soil, and in two pits no fill material was detected. The native soil beneath the fill material ranged from silt loam to silty clay loam. The depth to the upper boundary of the native soil appeared to be roughly level with that of the surrounding existing wetlands. Redox features were observed in most of the native soils



Notes:

1. Existing grade will be lowered to proposed grade to establish wetland.
2. This graphic is based on grading plans prepared by Caltrans included as Appendix E.

Figure 7-8
Wetland Establishment at Niesen Parcel (APN 108-040-02)
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below the fill material. In the pit located downslope of the stock pond, groundwater was observed at 40 inches depth. It is assumed that this water was a result of seepage from the pond.

All the sites were rated as having a medium or higher suitability because native alluvial, marsh-type soil exists at the elevation of the proposed finish grade, and most have redox features in the buried topsoil layer. It is expected that once wetland construction is complete, the established wetland will be sustained primarily by a high water table.

No topsoil importation is planned for the wetland because existing topsoil from the graded area will be harvested (approximately the top 4 inches) and stockpiled for later use in topdressing the established wetland. The use of existing topsoil for the established wetland, which is dominated by upland species, will not result in the reintroduction of nonnative upland species because the established wetland hydrology will preclude establishment of nonnative upland species. Topsoil will be stockpiled in upland areas outside ESA boundaries. Caltrans has determined that the excess soil from grading will be suitable for fill material within the project footprint.

As described in Section 5.1.3, groundwater hydrology in Little Lake Valley is related to the aquifer underlying the valley. The upper portion of the aquifer occurs in alluvium that is composed of silt, clay, gravel, and sand (Farrar 1986). The presence of sheets of fine-grained sediments causes much of the aquifer to be confined or semiconfined. Overall in Little Lake Valley, including this parcel, it is difficult to determine with certainty that the water is not perched on impermeable layers located above the main aquifer. If the water is perched, the primary source of water to support the wetlands on this parcel is rainfall (average annual precipitation of 50 inches per year) and surface runoff. If the water represents the top of the main aquifer, the wetlands on this parcel are supported by the aquifer as a whole. In either case, the presence of seasonally saturated wetlands adjacent to the established wetland site indicates that water is available for wetland establishment.

Surface hydrology at the Niesen parcel and in the area to be graded varies. In general, rainfall either percolates into the soil or occurs as surface runoff that flows downslope to an adjacent wet meadow. The hydrology will be altered as part of wetland establishment actions. As described below, the land surface will be lowered to match the elevation of the existing adjacent wet meadow. The land surface will slope gently to the north from the southern property boundary. An existing swale will be modified so that some of the drainage flows overland to support the established wet meadow. Additional surface hydrology will be provided by rainfall and surface runoff from the slope area east of existing US 101.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 3.92 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from the parcel and implementing 1.47 acres of Type 4 rehabilitation actions at two locations adjacent to the established wetland (Appendix C and Table 6-5).

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category II Riparian Corridor on Mill Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category II Riparian Corridor on Mill Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

7.3.2.27 TAYLOR (APN 037-210-16 AND 037-221-65)

The mitigation goal for these parcels is oak woodland and oak woodland grassland preservation. The parcels (APN 037-210-16 and APN 037-221-65) currently support oak woodland and oak woodland grassland. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. Rotational grazing will be used to maintain

oak woodland and grassland habitat. The grazing management for this parcel is described in the grazing plan (Appendix Q).

7.3.2.28 WATSON (APN 037-250-05)

The mitigation goal for this parcel is Type 1 wetland rehabilitation. Grazing will be prohibited on this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

WETLAND REHABILITATION

Wetland rehabilitation will be accomplished by prohibiting haying and other agricultural practices on this parcel, providing 49.53 acres of Type 1 rehabilitation actions (Appendix C and Table 6-5). Wetland rehabilitation preservation occurs on the entire parcel and extends from approximately US 101 on the west to Berry Creek on the east.

7.3.2.29 WATSON EAST (APN 037-221-30)

The mitigation goals for this parcel are BM rehabilitation, Group 1 and 2 wetland establishment, wetland rehabilitation, and oak woodland establishment. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

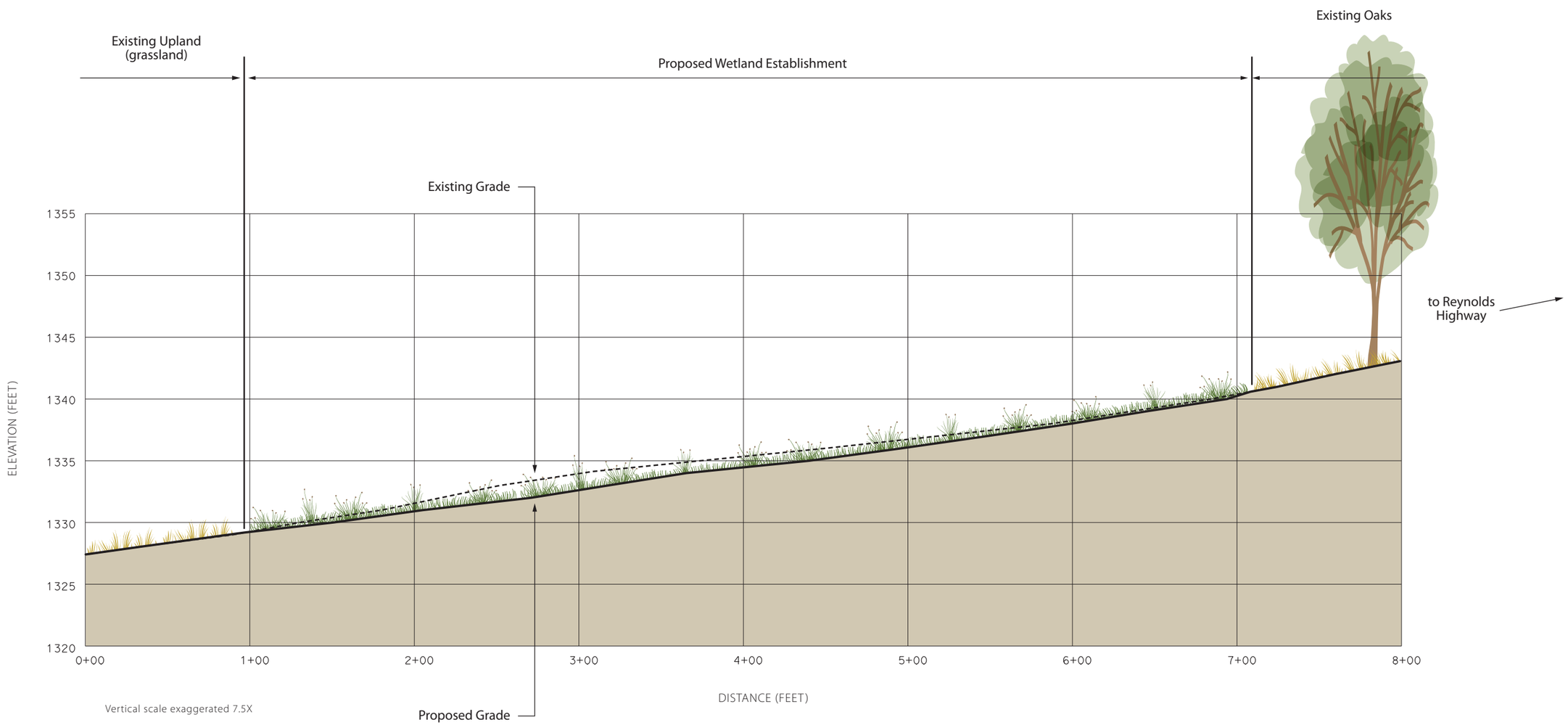
Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

Wetland establishment at the Watson East parcel will include the establishment of Group 1 and Group 2 wet meadow. Group 1 wetland establishment will include establishment of 7.03 acres of wet meadow. Group 2 wetland establishment at the Watson East parcel will consist of the establishment of 1.69 acres of wet meadow (Appendix C and Table 6-5). The Group 2 wetlands are in upland in a wet meadow complex, and the wetland design will be similar to the design for the Group 1 wetlands. These areas will be lowered to match, or be slightly lower than, the elevation of adjacent wetland habitat and will be seasonally saturated or inundated by rainfall and/or groundwater. Figure 7-9 is a graphic representation of the Group 1 wetland establishment efforts at the Watson East parcel. The grading and planting plans for offsite wetland establishment are presented in Appendix E.

A soil scientist conducted a soil evaluation to determine proposed Group 1 wetland establishment site suitability in July 2010. Soil pits were excavated at the wetland establishment site, the adjoining existing wetlands, and near the wetland reference monitoring site. Soil pits at the wetland establishment site were excavated to a depth below the proposed wetland soil surface elevation. Appendix O includes a memorandum (dated August 10, 2010) that presents the results of the soil evaluation for the Niesen parcel, as well as the other Group 1 wetland establishment areas. A soil evaluation was not performed for the two small Group 2 wetlands. Wetland establishment at these sites consists of lowering two small linear upland features that are presumed to have been artificially created based on their size and the surrounding land form. Soil suitability is inferred based on the wetland delineation results that identified the land surrounding these berms as wetland.

As described in Section 5.3.14.3, existing soil at this parcel and in the area to be graded is composed of Feliz clay loam, gravelly substratum (2–8% slopes) and Cole clay loam (0–2% slopes). Feliz clay loam gravelly substratum is a well-drained soil comprising clay loam from 0 to 46 inches and very gravelly clay loam from 46 to 63 inches depth. Cole clay loam is a somewhat poorly drained soil with clay loam from 0 to 8 inches, silty clay from 41 to 60 inches, and silty clay loam from 41 to 60 inches depth. Although the Feliz clay loam is well-drained, soil survey information from 1920 (Dean 1920) indicates that this Feliz soil was within the area of the lake that historically formed at the northern end of Little Lake Valley during the rainy season, even during very low rainfall years. This area of Little Lake Valley remains wet into the late spring and has saturated soil conditions that provide wetland hydrology, as evidenced by the existing wetlands that surround the two wetland establishment sites.



Notes:

1. Existing grade will be lowered to proposed grade to establish wetland.
2. This graphic is based on grading plans prepared by Caltrans included as Appendix E.

Figure 7-9
Wetland Establishment at Watson (Eastern) Parcel (APN 037-221-30)
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As described in Section 5.1.3, groundwater hydrology in Little Lake Valley is related to the aquifer underlying the valley. The upper portion of the aquifer occurs in alluvium that is composed of silt, clay, gravel, and sand (Farrar 1986). The presence of sheets of fine-grained sediments causes much of the aquifer to be confined or semiconfined. Overall in Little Lake Valley, including these parcels, it is difficult to determine with certainty that the water is not perched on impermeable layers located above the main aquifer. If the water is perched, the primary source of water to support the wetlands on these parcels is rainfall (average annual precipitation of 50 inches per year) and surface runoff. If the water represents the top of the main aquifer, the wetlands on these parcels are supported by the aquifer as a whole. In either case, the presence of seasonally saturated wetlands adjacent to the established wetland sites indicates that water is available for wetland establishment.

Surface hydrology at the Watson East parcel, including the area to be graded, is influenced by Berry Creek, which dissipates into an alluvial fan at the southwest boundary of the parcel. Two intermittent streams occur on the eastern half of the parcel. The southernmost of these streams drains onto the parcel from the east and eventually dissipates into a wet meadow area. This drainage is channelized from the point where it enters the Watson East parcel to its terminus in the wet meadow. The other intermittent stream is located in the northeast corner of the parcel and flows from an area east of Reynolds Highway onto the parcel before dissipating into a wet meadow. The western portion of the parcel is subject to frequent and prolonged ponding, flooding, and/or a seasonally high water table during the winter months. As part of wetland establishment actions at the Watson East parcel, the current hydrology will be altered by grading the northern drainage so that the flow is spread out into the center of the parcel.

Wetland establishment will be accomplished for the north wetland by grading uplands adjacent to existing wet meadow to establish additional wet meadow habitat. The newly graded wetlands will be tied into existing topographic contours. The north established wetland will be excavated (average range of 0 to 1.59 feet) to a depth comparable to adjacent wetlands. Wetland establishment will be accomplished for the south wetland by grading to lower the elevation to establish a larger wet meadow at the base of the new slope. The south established wetland will be excavated (range of 0 to 1.45 feet) to a depth comparable to adjacent wetlands (average range of 0 to 1.45 feet). The wetlands will be over-excavated to accommodate topsoil/plant duff containing BM seed and plant material. This topsoil/plant duff will be placed as an approximately 4-inch topdressing in both established wetlands. The excess soil from grading will be disposed of offsite.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 50.64 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by implementing 1.80 acres of Type 3 rehabilitation actions and 23.26 acres of Type 1 rehabilitation (Appendix C and Table 6-5). The Type 3 mitigation unit is adjacent to the Group 2 wetlands. The Type 1 mitigation unit is on the west side of Berry Creek.

OAK WOODLAND ESTABLISHMENT

Oak woodland establishment will be accomplished by planting oaks in uplands between the existing and established wet meadow and Reynolds Highway and south of the Group 1 wetlands (Appendix C).

7.3.2.30 WILDLANDS (APN 108-060-01)

The mitigation goals for this parcel are BM rehabilitation, Group 2 wetland establishment, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

Wetland establishment at this parcel will consist of Group 2 wetland establishment totaling 4.80 acres (Appendix C and Table 6-5). Two wetlands will be established. The established wetland on the west side of Davis Creek extends onto an adjacent Wildlands parcel (APN 108-020-07) and an adjacent Benbow parcel (APN 108-020-07). The established wetland on the east side of Davis Creek will extend from this parcel south onto the adjacent Wildlands parcel (APN 108-070-09). Figure 7-3 is a graphic representation of wetland establishment efforts on the west side of Davis Creek. Figure 7-10 is a graphic representation of wetland establishment efforts on the east side of Davis Creek. The grading and planting plans for offsite wetland establishment are presented in Appendix E.

Preliminary and detailed soil evaluations were performed on the parcel by a soil scientist in August and December 2011, respectively. A geomorphologist also participated in the survey to evaluate the condition of the existing land surface and its feasibility for establishing wetlands.

WETLAND ESTABLISHMENT (APN 108-060-01)

For the established wetland on the east side of Davis Creek, wetland grading will consist of lowering a portion of the adjacent uplands to match, or be slightly lower than, the elevation of the adjacent wet meadow located to the east. This wetland establishment site is expected to support wet meadow because the established wetland will share surface and groundwater characteristics similar to those of the existing wet meadow (i.e., it will be seasonally saturated or inundated by rainfall and/or is subject to a seasonal shallow groundwater table). This newly graded wetlands will be tied into existing topographic contours. The excess soil from grading will be disposed of offsite. This established wetlands will be seeded and planted with native wetland species.

One shallow soil pit was described during the preliminary soil evaluation in August 2011 and was located in the upland. This pit evaluation indicated that the soil type in the wetland establishment area is similar to that of the soils in the adjacent wet meadow. Three backhoe pit profiles were described during the detailed soil evaluation in December 2011. All four of these pits were placed in existing uplands. Soils in this parcel were assigned wetland establishment suitability ratings of *medium* or *high*. With the exception of profile E, the profiles were inferred to have moderate permeability at or just below finish grade and therefore suitable for wetland establishment. Profile E will have a gravelly loam layer at finish grade, but because that layer has only 20% gravel content, it is expected to be moderately permeable. The profile also contains a sand lens between 15 and 16 inches depth, but because it appears not to be continuous, it is not expected to cause significant losses of water from the profile. Because the soil will be a

moderately permeable loam at and just below finish grade, it will be suitable for wetland establishment.

The establishment site on this parcel also was surveyed by a geomorphologist to evaluate the condition of the existing land surface and its feasibility for establishing wetlands. The western extent of this established wetland will be approximately 100 feet from the top of bank on Davis Creek. It was determined that the proposed grading area would not encroach on, lower, or impair the existing natural levee. The geomorphologist also evaluated the area for the potential for overbank flow and sediment deposition. Based on this assessment, the south end of the proposed wetland area was removed from consideration. The proposed wetland boundary reflects this assessment.

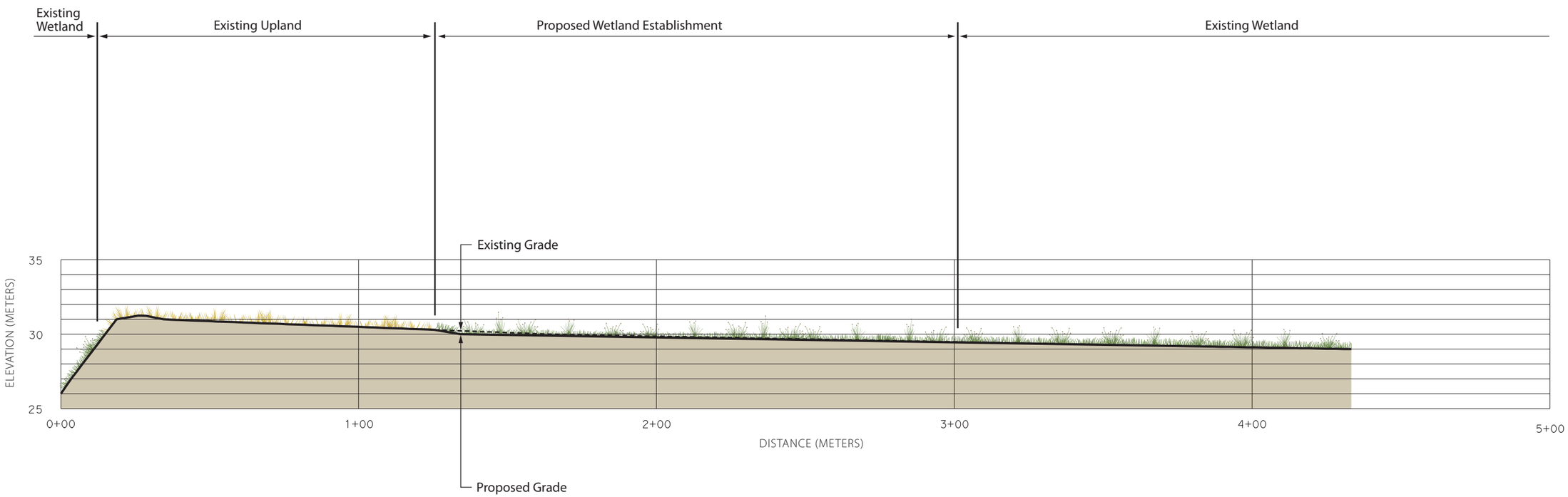
WETLAND ESTABLISHMENT (APN 108-020-07)

For the established wetland on the west side of Davis Creek, wetland grading will consist of lowering a portion of the adjacent uplands to match, or be slightly lower than, the elevation of wet meadow located to the west on the Benbow parcel. This wetland establishment site is expected to support wet meadow because the established wetland will share surface and groundwater characteristics similar to those of the existing wet meadow (i.e., it will be seasonally saturated or inundated by rainfall and/or is subject to a seasonal shallow groundwater table). This newly graded wetland will be tied into existing topographic contours. The excess soil from grading will be disposed of offsite. This established wetland will be seeded and planted with native wetland species.

This area is part of the wetland establishment area on an adjacent Wildlands parcel (APN 108-020-07) and a Benbow parcel (108-020-06). Soil and topographic information is provided in Section 7.3.2.2. This newly graded wetland will be tied into existing topographic contours. The excess soil from grading will be disposed of offsite. The established wetlands will be seeded and planted with native species.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 36.54 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).



Notes:

1. Existing grade will be lowered to proposed grade to establish wetland.
2. This graphic is based on grading plans prepared by Caltrans included as Appendix E.

Figure 7-10
Wetland Establishment at Wildlands Parcel (APN 108-070-09)
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WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from a portion of the parcel and implementing Type 4 rehabilitation actions totaling 2.97 acres on the east side of Davis Creek (Appendix C and Table 6-5).

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridor on Davis Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridor on Davis Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Davis Creek, excluding cattle from existing riparian vegetation in the riparian corridors, and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.31 WILDLANDS (APN 108-020-07)

The mitigation goals for this parcel are BM rehabilitation, Group 2 wetland establishment, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on a small portion of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

Wetland establishment at this parcel will consist of Group 2 wetland establishment totaling 2.18 acres (Appendix C and Table 6-5). The established wetland extends onto an adjacent Wildlands parcel (APN 108-060-01) and an adjacent Benbow parcel (APN 108-020-06) (Appendix C). Figure 7-3 is a graphic representation of wetland establishment on this parcel. The grading and planting plans for offsite wetland establishment are presented in Appendix E.

The wetland establishment area encompasses small inclusions of existing uplands within and adjacent to the wet meadow complex that will be lowered to match, or be slightly lower than, the elevation of adjacent wetland habitat and will be seasonally saturated or inundated by rainfall and/or groundwater. A small berm also occurs in the footprint of the established wetland. The berm will be removed during wetland grading. Soil and topographic information is provided in Section 7.3.2.2.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 1.48 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridor on Davis Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridor on Davis Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Davis Creek, excluding cattle from existing riparian vegetation in the riparian corridors, and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.32 WILDLANDS (APN 108-060-02)

The mitigation goals for this parcel are BM rehabilitation, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 92.34 acres of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from and widening the riparian corridor on Berry Creek, and implementing 7.33 acres of Type 5 wetland rehabilitation (Appendix C and Table 6-5) by planting native riparian vegetation in the riparian corridor.

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridor on Berry Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Berry Creek, excluding cattle from existing riparian vegetation in the riparian corridors, and widening the riparian corridors by planting additional riparian vegetation under the Type 5 rehabilitation action (Appendix C and Table 6-6).

7.3.2.33 WILDLANDS (APN 108-070-09)

The mitigation goals for this parcel are BM rehabilitation, Group 2 wetland establishment, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND ESTABLISHMENT

Wetland establishment at this parcel will consist of Group 2 wetland establishment totaling 4.27 acres (Appendix C and Table 6-5). The established wetland footprint will extend from this parcel north onto the adjacent Wildlands parcel (APN 108-060-01). The grading and planting plans for offsite wetland establishment are presented in Appendix E. Figure 7-10 is a graphic representation of wetland establishment efforts at these parcels.

Wetland grading will consist of lowering a portion of this upland to match, or be slightly lower than, the elevation of the adjacent wet meadow located to the east. The wetland establishment site is expected to support wet meadow because the established wetland will share surface and groundwater characteristics similar to those of the existing wet meadow (i.e., it will be seasonally saturated or inundated by rainfall and/or is subject to a seasonal shallow groundwater table). The newly graded wetlands will be tied into existing topographic contours. The excess soil from grading will be disposed of offsite. The established wetlands will be seeded and planted with native wetland species.

Preliminary and detailed soil evaluations were performed on the parcel by a soil scientist in August and December 2011, respectively. A geomorphologist also participated in the survey to evaluate the condition of the existing land surface and its feasibility for establishing wetlands. Four shallow soil pit profiles were described—three placed in existing uplands, and the remaining pit located in the adjacent wet meadow to serve as a reference area. The soil profile and site description forms are provided in Appendix O. The survey results indicate that the soil type and range of soil characteristics in the proposed wetland establishment area are similar to the range of soils in the adjacent wet meadow.

Three backhoe pit profiles (detailed soil evaluation) were described, all of which were placed in existing uplands. Soils in this parcel were assigned wetland establishment suitability ratings of *medium-high* or *high*. The profiles were inferred to have moderate permeability at or just below finish grade and therefore suitable for wetland establishment. Profile C will have a stratified silt loam and loamy sand layer 15 inches below finish grade and a continuous, 1-inch-thick loamy sand layer 18 inches below finish grade. A clay loam Bg horizon below these stratified layers should prevent excessive deep percolation losses. Because the soil will be a moderately permeable loam at and just below finish grade, it will be suitable for wetland establishment.

As identified on the soil profile and site description forms in Appendix O, as mapped by the NRCS, the existing soil map unit in all of the upland and wetland soil pits was Fluvaquents. The slope gradient in the upland pit locations was variable, ranging from 0 to 2% depending on location. The slope gradient in the wetland sample locations also ranged from 0 to 2% depending

on location. The soil evaluation results, as expected, were variable between the uplands and wetland reference sites; however, the upland and wetland reference sites shared similar soil texture, soil structure, redoximorphic features, and permeability (inferred).

Wetland inundation surveys were performed for the offsite mitigation parcels during December 2010 through May 2011. Based on preliminary inundation survey results, reported in a baseline report prepared by Caltrans (2011), the majority of the adjacent wetland was inundated for up to 2 months. Approximately one half of the uplands proposed for wetland establishment also were inundated for a period of 1 to 2 months. The wetland inundation surveys did not assess soil saturation, but it is presumed that some of the upland soils also may have been saturated for an extended period of time during the winter of 2010–2011. The proposed establishment site also was surveyed by a geomorphologist to evaluate the condition of the existing land surface and its feasibility for establishing wetlands. The western extent of this established wetland will be approximately 100 feet from the top of bank on Davis Creek. It was determined that the proposed grading area would not encroach on, lower, or impair the existing natural levee. The geomorphologist also evaluated the area for the potential for overbank flow and sediment deposition. Based on this assessment, the south end of the proposed wetland area was dropped from consideration. The proposed wetland boundary reflects this assessment.

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 84.10 acres of this parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from a portion of the parcel and implementing Type 3, Type 4, and Type 5 rehabilitation actions totaling 9.83 acres (Appendix C and Table 6-5). Type 3 rehabilitation actions (3.44 acres) will be implemented on the west side of Davis Creek. Type 4 rehabilitation actions (4.04 acres) will be implemented in wet meadow adjacent to the Group 2 wetland location. Type 5 wetland rehabilitation (2.35 acres) will be accomplished by removing grazing from and widening the riparian corridors adjacent to Berry Creek by planting native riparian species.

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridors on Davis Creek and Berry Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridor on Davis Creek and Berry Creek and in a portion of the Category II Riparian Corridor on Berry Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Davis Creek and Berry Creek, excluding cattle from existing riparian vegetation in the riparian corridors, and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.34 WILDLANDS (APN 108-070-08)

The mitigation goals for this parcel are BM rehabilitation, wetland rehabilitation, riparian establishment, riparian rehabilitation, and other waters rehabilitation. Grazing will be retained on the majority of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on 44.47 acres of the parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from a portion of the parcel and implementing Type 3 and Type 4 rehabilitation actions totaling 7.09 acres (Appendix C and Table 6-5). Type 3 rehabilitation actions (0.11 acre) will be implemented on the north side of the parcel and will be connected to a larger Type 3 rehabilitation unit on an adjacent parcel. Type 4 rehabilitation actions (6.98 acres) will be implemented in wet meadow adjacent to Davis Creek and an unnamed drainage.

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridor on Davis Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

RIPARIAN REHABILITATION

Riparian rehabilitation will occur in portions of the Category I Riparian Corridor on Davis Creek and an unnamed tributary to Davis Creek that currently support woody riparian vegetation. Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-3).

OTHER WATERS REHABILITATION

Other waters rehabilitation will be accomplished by excluding cattle from Davis Creek and an unnamed tributary to Davis Creek, excluding cattle from existing riparian vegetation in the riparian corridors, and widening the riparian corridors by planting additional riparian vegetation (Appendix C and Table 6-6).

7.3.2.35 WILDLANDS (APN 108-030-08)

The mitigation goals for this parcel are BM rehabilitation, wetland rehabilitation and riparian establishment. Grazing will be retained on a portion of this parcel.

The performance standards for mitigation actions at this parcel are presented in Chapter 9, and the corresponding monitoring methods are presented in Chapter 10. Information about long-term management and adaptive management is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcel are shown in Appendix C.

BAKER'S MEADOWFOAM REHABILITATION

Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. Grazing management will occur on the majority of this parcel. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—GRAZED AREAS

Rotational grazing will be used to promote the establishment of native wetland species. Grazing management will occur on a small area on the south end of this parcel. Grazing management will occur on 4.42 acres of the parcel (Appendix C and Table 6-5). Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for this parcel is described in the grazing plan (Appendix Q).

WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation will be accomplished by removing grazing from a portion of the parcel and implementing Type 3 rehabilitation actions totaling 2.08 acres (Appendix C and Table 6-5). The rehabilitation actions will be connected to a Type 3 rehabilitation unit on an adjacent parcel.

RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I Riparian Corridor on Davis Creek that currently do not support woody riparian vegetation. The locations of the riparian establishment areas are shown in Appendix C. Riparian establishment will include site preparation to clear the planting area of ruderal vegetation and invasive species, installation of container plants and cuttings of native riparian species, seeding with native grasses and forbs, and installing an irrigation system (if necessary).

7.3.3 Offsite Mitigation Techniques

For ease of discussion, information in this section is presented as shown below.

- Establishment and rehabilitation techniques for NCSG habitat.
- Rehabilitation techniques for BM habitat.
- Establishment techniques for wetland, riparian, and oak woodland habitat.
- Rehabilitation techniques for wetland, riparian, and other waters habitat.
- Preservation techniques for wetlands, other waters, and oak woodlands.

Except where mitigation properties share a boundary with the operating right of way, wildlife fencing will be used on the mitigation properties, including the interior fencing. Fencing will be installed using CDFG's recommendations or similarly acceptable configuration, as determined by the Caltrans biologist. Any existing woven wire will be removed and replaced with wildlife friendly fence. Where boundaries are shared, standard right of way fencing will be installed, which consists of woven fence with barbed wire strands at the top.

Guidelines for wildlife fence:

- The bottom wire should be at least 16 inches above the ground; smooth wire is preferable,
- The top two wires should be spaced at least 12" apart, and
- The top wire should be no higher than 42", preferably 40"

7.3.3.1 NORTH COAST SEMAPHORE GRASS ESTABLISHMENT AND REHABILITATION

NCSG will be mitigated through establishment and rehabilitation actions described below and in Table 7-2.

ESTABLISHMENT OF NORTH COAST SEMAPHORE GRASS

Establishment of NCSG will occur on the Huffman offsite mitigation parcel. Existing NCSG populations on the Huffman parcel are shown in Appendix C and on Figure 5-9. NCSG establishment area is shown in Appendix C.

Mitigation activities on this parcel will include conservation of existing populations, transplanting salvaged NCSG, seeding, and planting of container stock. Caltrans will develop a management approach to maintain the NCSG populations on this parcel. Caltrans implemented a pilot study in December 2011 that consisted of transplanting individual plants to and planting container stock in the NCSG establishment area (Caltrans constructed cattle exclusion around the

NCSG establishment area in 2010). As part of this study, Caltrans will monitor the effectiveness of these actions and incorporate the lessons learned into future NCSG mitigation activities on this parcel.

Known populations of NCSG to be affected by construction will be salvaged before the commencement of construction for transplantation to the adjacent NCSG establishment area (Figure 5-9). The timing of salvage operations will be determined by a biological monitor.

Boundaries of known populations on the Huffman parcel will be identified in the field when the plants are in bloom and most evident and identifiable (April–May). Fencing will be installed around the populations to identify and protect NCSG until the seeds are mature. When the biological monitor has determined that the seeds have matured, they will be harvested.

After the seeds have been harvested, the plants and rhizomes will be excavated and transplanted to the NCSG establishment area. The seed will be collected for conservation at a germplasm repository, for direct sowing at the transplantation location, and for propagation by a native plant nursery. Propagated plants will be used for future planting in the NCSG establishment area.

REHABILITATION OF NORTH COAST SEMAPHORE GRASS

Rehabilitation of NCSG will occur on five offsite mitigation parcels (Table 6-1, Figures 5-7, 5-8, and 5-10). Mitigation activities on these parcels will include conservation of existing populations and implementing a grazing management program to maintain or improve the NCSG habitat on these parcels.

IMPLEMENT GRAZING MANAGEMENT PLAN

Caltrans has developed a grazing management plan for the offsite mitigation parcels (Appendix Q). The grazing plan will identify management techniques to rehabilitate NCSG habitat through a grazing program. The adaptive management component of the mitigation program (Chapter 12) includes flexibility to adjust the grazing plan on a pasture-by-pasture basis to reflect the influence of seasonal variations and site-specific conditions.

7.3.3.2 BAKER'S MEADOWFOAM REHABILITATION

BM will be mitigated by offsite rehabilitation of both existing populations and identified potential habitat.

IMPLEMENT GRAZING MANAGEMENT PLAN

Caltrans has developed a grazing management plan for the offsite mitigation parcels (Appendix Q). The grazing plan identifies management techniques to rehabilitate BM habitat through a grazing program. Rotational grazing will be used to maintain or improve occupied and potential habitat of BM. The adaptive management component of the mitigation program (Chapter 12) and the grazing plan includes flexibility to adjust the grazing plan on a pasture-by-pasture basis to reflect the influence of seasonal variations and site-specific conditions. Stocking rates, grazing season, and rotation schedule will be adjusted as needed in response to BM performance and local conditions. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. It also allows experimental strategies in stocking, rotation, and seasons to be tested (in small areas) to gain more insight into the best grazing practices for BM. The grazing management for this parcel is described in the grazing plan (Appendix Q).

7.3.3.3 WETLAND ESTABLISHMENT

Wetlands will be established on some offsite mitigation parcels. The type and location of establishment are shown in Appendices C and E and listed in Table 7-2.

The parcels on which wetland establishment occurs are:

- Benbow (APN 108-040-13)
- Benbow (APN 108-020-06)
- Ford (APN 108-010-06)
- Ford (APN 108-020-04)
- Ford (APN 108-030-02)
- The Goss/MGC Plasma Middle/MGC Plasma North complex (3 parcels)
- Lusher (APN 108-030-04)
- Niesen (APN 108-040-02)
- Watson East (APN 037-221-30)
- Wildlands (APN 108-020-07)
- Wildlands (APN 108-060-01)
- Wildlands (APN 108-070-09)

Wetland establishment will include grading upland habitats to establish depressions or swales that will be seasonally inundated or saturated. Wetland establishment also will include modifying existing drainages (originally established to drain parcels quickly so that pastureland could be improved for grazing and hay production) to prolong surface water retention on the parcels in support of established wetlands.

Wetland establishment will entail the following activities, discussed below.

- Site preparation
- Grading
- Seeding
- Collecting and installing planting stock
- Inspecting construction
- Documenting as-built conditions

SITE PREPARATION

Preparation of offsite mitigation parcels will entail the following activities, discussed below.

- Surveying and staking wetland establishment areas
- Installing ESA fencing
- Installing erosion control measures and using BMPs
- Preparing wetland topsoil stockpile areas
- Clearing vegetation and debris
- Salvaging State-listed plant populations

SURVEYING AND STAKING WETLAND ESTABLISHMENT AREAS

Prior to mitigation construction, the limits of the wetland establishment areas, including staging areas, topsoil stockpiling areas, and access roads, will be surveyed and staked. The exact locations will be based on the mitigation construction plans and specifications for contractor use (Appendix E).

ENVIRONMENTALLY SENSITIVE AREA FENCING

Prior to construction, Caltrans will install protective fencing and, where necessary, silt fencing around ESAs to be avoided. Protective fencing will consist of orange plastic-mesh fencing that is secured to metal T-posts and will be installed in accordance with the project construction documents. Silt fencing may be installed around avoided wetlands, other waters, and riparian habitat to prevent soil and sediment from entering the habitat. The project's contractor will prepare a SWPPP. The SWPPP will include all required BMPs. Silt fencing may be used in combination with protective fencing and will be installed in accordance with the SWPPP. The BMPs will be those specified in the updated MRP to be prepared by NCRWQCB and/or those specified in the project construction documents.

INSTALLING EROSION CONTROL MEASURES AND USING BEST MANAGEMENT PRACTICES

Implementation of the mitigation will require a SWPPP. Specific erosion control measures and BMPs will be provided in the document. Caltrans will review the contractor-prepared SWPPP for compliance with the mitigation construction plans and special provisions. The SWPPP then will be submitted to the NCRWQCB for approval. The following typical erosion control measures and BMPs have been identified in the mitigation construction plans and special provisions. These measures will be employed during site preparation and construction efforts and remain in place until ground-disturbing activities have ended (not an exhaustive list).

- Prior to the start of construction activities, all personnel will receive water pollution–control training.
- A temporary construction entrance will be installed and maintained to provide temporary access to the mitigation construction areas.
- Temporary fiber rolls will be installed and maintained around areas in which grading activities will occur to reduce sedimentation.
- Exposed slopes will be hydroseeded upon completion of construction activities to reduce erosion and sedimentation.
- Materials will be delivered, used, and stored in a way that minimizes or eliminates discharge of material into watercourses.
- Fueling, lubrication, maintenance, storage and staging of vehicles and equipment will be at east 150 feet beyond waters of the U.S and the State with the exception of cranes and stationary equipment, which will only be refueled using a company certified by the CDFG.

- Material stockpiles will be covered with plastic sheeting or geosynthetic fabric when not in use and surrounded with a linear sediment barrier, and/or placed on pallets.
- Wastewater from invasive species control and equipment washing must be disposed of at an appropriately permitted facility or comply with the proper NPDES requirements for discharges. Wastewater from vehicle cleaning will not be allowed for on-site use for any purposes unless it is demonstrated to the satisfaction of the NCRWQCB that it has been adequately treated for potential pollutants and invasive species.
- Spill- and leak-prevention procedures will be implemented for chemicals and hazardous substances stored at the mitigation construction site.
- Trash and debris will be removed from the job site at least once per week and will not be allowed to accumulate.

PREPARING WETLAND TOPSOIL STOCKPILE AREAS

Topsoil will be harvested from most of the Group 1 and Group 2 wetland establishment areas and stockpiled for later use in topdressing the established wetlands. Topsoil harvesting will consist of scraping the top 1–2 inches of soil to remove vegetation. This material will be disposed of offsite. After the initial topsoil removal, approximately the next 4 inches of topsoil will be stripped and stockpiled in upland areas outside ESA boundaries for later use. At the Watson East parcel, topsoil/plant duff salvaged from observed populations of BM from a select area in the project footprint will be used to topdress the Group 1 established wetland. If there is leftover duff after topdressing the Group 1 wetland, the excess will be applied to Group 2. At the Ford (APN 108-010-06) and Niesen parcels, topsoil importation might need to be considered based on resource agency concerns regarding the appropriateness of the existing topsoil for topdressing the established wetlands at these parcels. Similar to topsoil that will be used at the Watson East parcel, topsoil for the Ford and Niesen parcels could be imported from within the project footprint prior to construction disturbance.

To prepare stockpile areas, existing ruderal vegetation will be removed and legally disposed of offsite at a landfill or other facility that accepts green waste. Topsoil stockpiles will be stored separately from other grading spoils. The topsoil will be stored at ambient temperatures and protected from rainfall.

VEGETATION AND SITE CLEARING

The extent of vegetation and site clearing at the offsite mitigation parcels will depend on the amount of grading required or the amount of debris or structures to be removed. Where extensive grading is necessary (e.g., Niesen parcel), vegetation and site clearing may not be necessary

because existing vegetation and/or debris will be removed as part of these grading activities. Where extensive grading is not necessary and existing topsoil remains largely in place, some vegetation and debris removal may be necessary.

Vegetation clearing at the offsite mitigation parcels will include mowing herbaceous vegetation to a height of 1–3 inches in the habitat establishment areas, topsoil stockpiling areas, staging areas, and access roads. Some clearing or pruning of woody vegetation may be necessary to allow equipment access and could consist of removing the entire aboveground portion of the plant or pruning low-hanging branches. Cut vegetation will be legally disposed of offsite at a landfill or other facility that accepts green waste. Because the woody vegetation may include oaks, it will be necessary to confirm with the disposal facility that oak wood is accepted in light of possible disposal quarantines related to sudden oak death disease.

Nonchemical methods for invasive plant control are preferred over chemical methods. If chemical methods are used, chemicals (herbicides) will be applied under the direction of a licensed herbicide applicator and in strict accordance with all applicable regulations for their use.

If vegetation clearing is necessary during the migratory bird nesting season, a qualified biologist will conduct preconstruction surveys to identify active nests, and the appropriate species-specific avoidance and minimization measures will be implemented where practical.

SALVAGING STATE-LISTED PLANT POPULATIONS

Offsite wetland establishment areas have been designed to avoid observed populations of NCSG and BM should they occur on offsite mitigation parcels. NCSG will be completely avoided. If populations of BM are found, and temporary impacts cannot be avoided, a possible option could be to salvage plant material for onsite relocation following mitigation construction. Salvage operations may include seed collection and/or plant duff and topsoil harvesting (Section 7.2.1.4).

GRADING

Grading will be necessary to establish wetland depressions and swales and to improve parcel hydrology. Grading will be performed by a licensed contractor who will use appropriately sized construction equipment.

The locations of wetland establishment areas are shown in Appendix C. The grading plans for offsite wetland establishment are presented in Appendix E. Wetland establishment will result in the conversion of uplands to wetlands. Grading also will be used to provide more natural drainage patterns by capturing flow that currently is channelized in drainage ditches and using it to provide wetland hydrology as part of the grading for established wetlands.

Grading will be limited to the dry season (late spring through early fall), with erosion control seed mixes being applied after grading has been completed to prevent loosened material/sediment from entering wetlands or other waters on and adjacent to the offsite mitigation parcels.

For those locations requiring topsoil application, the subgrade will be excavated to a depth sufficient to accommodate the stockpiled topsoil while providing appropriate finish-grade topography to support wetland hydrology and vegetation. The reapplied topsoil layer will be a minimum of approximately 4 inches deep. The topsoil will not be compacted, except for any wheel compaction that occurs as a result of reapplication. It is desirable to keep the topsoil in an uncompacted, friable condition while relying on an erosion control seed mix to hold the soil in place during heavy rains.

SEEDING

WETLAND SEEDING

Wetland seed mixes consisting of native grasses and forbs will be used to seed established wetlands. The seed mixes are composed of those species identified as target species. Other native wetland plants suitable for wetland establishment may be added and will contain an appropriate number of species to meet the species richness performance standards in Chapter 9. Seed mix development considered wetland delineation vegetation data, August 2010 vegetation surveys at the wetland establishment parcels, baseline surveys performed in spring 2012 (to determine existing native wetland plant cover and species composition), and other field observations. The wetland seed mixes are presented in Appendix E.

The seed mixes may be revised based on seed availability at the time of mitigation construction and seed application. Prior to seed application, Caltrans will provide USACE with any changes to the seed mixes so that USACE can confirm that the seed mix contains a minimum of 15 species from the target species list (Table 7-5). For the wetland establishment site at the Ford parcel, a seed mix has not been identified for mixed marsh (only for wet meadow) because this section of the establishment site is not expected to be subjected to erosive flows and will be inundated for prolonged periods during the rainy season.

The wet meadow seed mix will be applied to all established wetland habitat, including established wetland habitat at the Watson East offsite mitigation parcel that will be topdressed with topsoil/plant duff salvaged from the project footprint for BM. The seed mixes will be applied during early fall following completion of mitigation grading to reduce erosion. Wetland seeding will occur before installing wetland container plants.

UPLAND SEEDING

An upland seed mix will be used to seed disturbed upland areas in the offsite mitigation parcels. The list of target species (Table 7-5) does not apply to the upland seed mix. The seed mix may be revised based on seed availability at the time of mitigation construction and seed application. The upland seed mix will consist of native grasses and wildflowers; it will be applied during early fall following completion of mitigation grading to reduce erosion.

APPLICATION METHODS

The soil surface in the established wetlands and disturbed upland areas will be scarified before seeding to ensure adequate root penetration for seeds. The seed mixes will be applied using standard hydroseeding methods at the rates specified in Appendix E. All seeded areas then will be mulched with sterile rice straw or an approved weed-free equivalent to protect the seed until it germinates.

The mulch material will be of high quality (i.e., not musty, moldy, caked, or otherwise of low quality). The use of mulch that contains invasive weeds will not be permitted. Straw mulch material will be stabilized using a mulch crimper or equivalent straw-anchoring tool. The crimper will be straight and capable of firmly punching the mulch into the soil. Hand methods will be used to anchor the straw where crimping equipment cannot be operated safely. Straw mulch material also may be stabilized using a suitable tackifier. If a tackifier is used, it will be applied uniformly over the mulch material at the specified rate.

PLANTING

Plant palettes have been developed for each wetland establishment site based on wetland delineation vegetation data, August 2010 vegetation surveys at the wetland establishment parcels, other field observations, and input from regulatory agencies. The planting lists are presented in Appendix E. Caltrans will contract with a plant nursery experienced with the propagation of native herbaceous wetland plants to propagate container plants for mitigation efforts. Planting stock for wetland habitat will be propagated and planted as described in Section 7.2.4.1, Container Plant Propagation and Installation, and in the paragraphs below.

The locations for individual plantings will be identified using pin flags. Each species will be assigned a specific flag color to ensure that plant material is planted at the proper location.

WETLAND CONTAINER PLANT INSTALLATION

Wetland container plants will be planted in the winter after the offsite mitigation parcels have been graded and rainfall has saturated the soil to a depth of approximately 10 inches. Wetland seeding will be performed prior to container plant installation. Container plants will be propagated and installed as described in Section 7.2.4.1, Container Plant Propagation and Installation, and in this section.

Container plants will consist of tree band or equivalent sized container stock. Container plants will be installed in clusters in the established wetland depressions and swales. Container plants will be installed in a planting hole that is twice the width of and no deeper than the container. Soil removed when the planting hole is created will be used as backfill. Watering basins or bark mulch will not be required for wetland container plants.

Container plants will be placed in the planting hole so that the root collar is slightly above the desired final grade, with the top of the first major root barely visible at the surface. The plant will be watered immediately after planting and will be inspected after initial watering to ensure that settling has not occurred. Any container plants that have settled will be adjusted so the appropriate length is exposed aboveground.

CONSTRUCTION INSPECTIONS

Caltrans will conduct progress inspections of the mitigation efforts to ensure that offsite mitigation is fully and properly completed. Areas not meeting the implementation standards identified above will be reevaluated and replanted as necessary. At a minimum, Caltrans will perform inspections at the following critical stages of mitigation implementation.

- Layout of proposed mitigation establishment boundaries prior to construction.
- Placement and installation of ESA fencing.
- Installation of erosion control measures and use of BMPs.
- Site preparation and vegetation clearing operations.
- Harvesting of wetland topsoil and seed material.
- Grading operations, including placement of stockpiled wetland topsoil.
- Irrigation system installation (if applicable) and initial plant watering.
- Placement of stockpiled wetland topsoil.
- Seeding and planting operations.

AS-BUILT CONDITIONS DOCUMENTATION

Within 45 days from the completion of wetland establishment efforts, Caltrans will submit a complete set of as-built drawings to the resource agencies. The as-built drawings will be prepared using MicroStation (version 7 or later) software and will be at the same scale as the construction drawings. The as-built drawings will be prepared following standard landscape architecture protocols and practices. The as-built drawings will depict the features listed below.

- Established wetland boundaries, including planted and seeded areas.
- Updated plant palettes, including species, plant material type (e.g., tree band, 1-gallon, cutting, acorn), and number of plants planted by species.
- Updated seed mix, including application rates.
- Plant watering method, including water source identification and delivery system design, and application rates.
- Fences, gates, and access roads.
- Final elevations.
- Other pertinent mitigation features.

7.3.3.4 WETLAND REHABILITATION

As defined in Chapter 2, "Objectives," *rehabilitation* is the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historical functions of a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function but does not result in a gain in aquatic area. Wetlands will be rehabilitated using two strategies, grazing and not grazing. Table 7-2 lists rehabilitation strategies and corresponding actions to implement these strategies.

Rotational grazing will be used to maintain or improve occupied and potential habitat of NCSG and BM and to promote the establishment of native wetland species. Grazing management will occur at the locations shown in Appendix C. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management is described in the grazing plan (Appendix Q).

Wetlands will be rehabilitated in the ungrazed areas by using multiple levels of planting intensities, labeled as rehabilitation Types 1–5. Type 1 is the least intense and requires no planting (successional development), and Type 5 requires the highest level of planting effort. The location and type of rehabilitation actions for each parcel are shown in Appendix C. Table 6-

5 summarizes the rehabilitation acreage for each parcel. In this section, a general description of each rehabilitation type and details for implementation techniques are provided.

As described in Chapter 6, "Determination of Credits," five types of wetland rehabilitation have been developed. With the more aggressive rehabilitation types (Types 3–5), wetland rehabilitation will include clearing existing patches of nonnative wetland vegetation and replanting and seeding with native species. In addition to planting and seeding, some level of successional development is part of each rehabilitation type in untreated areas. For all types of wetland rehabilitation, management activities that would inhibit successional vegetative development will be excluded from the rehabilitation sites. Each rehabilitation type also has specific performance standards (Chapter 9).

Offsite wetland rehabilitation (ungrazed) will entail the following activities, discussed below.

- Site preparation
- Seeding
- Planting
- Plant watering
- Construction inspections
- Documentation of as-built conditions

SITE PREPARATION

Preparation of offsite wetland rehabilitation areas will entail the following activities, discussed below.

- Surveying and staking mitigation establishment areas
- Installing ESA protective fencing
- Installing erosion control measures and using BMPs
- Clearing vegetation and debris

SURVEYING AND STAKING MITIGATION REHABILITATION AREAS

Prior to mitigation construction, the limits of the mitigation rehabilitation areas, including staging areas and access roads, will be surveyed and staked. The exact locations will be based on the mitigation construction plans and specifications for contractor use (Appendix C and E).

ENVIRONMENTALLY SENSITIVE AREA FENCING

Prior to construction, Caltrans will install protective fencing and, where necessary, silt fencing around ESAs to be avoided. Protective fencing will consist of orange plastic-mesh fencing that is secured to metal T-posts and will be installed in accordance with the project construction documents. Silt fencing may be installed around avoided wetlands, other waters, and riparian habitat to prevent soil or sediment from entering the habitat. Silt fencing may be used in combination with protective fencing and will be installed in accordance with the project's SWPPP (to be prepared by the contractor) and with project BMPs. The BMPs will be those specified in the updated MRP to be prepared by NCRWQCB and/or those specified in the project construction documents.

INSTALLING EROSION CONTROL MEASURES AND USING BEST MANAGEMENT PRACTICES

Implementation of the mitigation will require a SWPPP. Specific erosion control measures and BMPs will be provided in the document. Caltrans will review the contractor-prepared SWPPP for compliance with the mitigation construction plans and special provisions. The SWPPP then will be submitted to the NCRWQCB for approval. The following typical erosion control measures and BMPs have been identified in the mitigation construction plans and special provisions. These measures will be employed during site preparation and construction efforts and remain in place until ground-disturbing activities have ended (not an exhaustive list).

- Prior to the start of construction activities, all personnel will receive water pollution–control training.
- A temporary construction entrance will be installed and maintained to provide temporary access to the mitigation construction areas.
- Temporary fiber rolls will be installed and maintained around areas in which grading activities will occur to reduce sedimentation.
- Exposed slopes will be hydroseeded upon completion of construction activities to reduce erosion and sedimentation.
- Materials will be delivered, used, and stored in a way that minimizes or eliminates discharge of material into watercourses.
- Fueling, lubrication, maintenance, storage and staging of vehicles and equipment will be at east 150 feet beyond waters of the U.S and the State with the exception of cranes and stationary equipment, which will only be refueled using a company certified by the CDFG.

- Material stockpiles will be covered with plastic sheeting or geosynthetic fabric when not in use and surrounded with a linear sediment barrier, and/or placed on pallets.
- Wastewater from invasive species control an equipment washing must be disposed of at an appropriately permitted facility or comply with the proper NPDES requirements for discharges. Wastewater from vehicle cleaning will not be allowed for on-site use for any purposes unless it is demonstrated to the satisfaction of the NCRWQCB that it has been adequately treated for potential pollutants and invasive species.
- Spill- and leak-prevention procedures will be implemented for chemicals and hazardous substances stored at the mitigation construction site.
- Trash and debris will be removed from the job site at least once per week and will not be allowed to accumulate.

VEGETATION AND SITE CLEARING

The extent of vegetation and site clearing at a given mitigation unit will vary depending on whether it is designated as a Type 2, Type 3, Type 4, or Type 5 rehabilitation area. The total area of vegetation clearing provided for a given mitigation unit will depend on the total acreage of the mitigation unit and the required percent increase in relative cover by native wetland species over baseline conditions for each mitigation unit. For example, if Type 4 rehabilitation is proposed on a 10-acre mitigation unit, the unit must demonstrate a 70% increase in relative cover by native wetland species over baseline conditions). Therefore, vegetation clearing will need to occur on 70% (7 acres) of the mitigation unit in order to accommodate the appropriate level of necessary plantings.

The total acreage of vegetation clearing on a parcel will be subdivided into smaller vegetation clearing areas that are distributed across the parcel. These cleared areas represent the areas that will be planted and are referred to as planting units. The planting units may be of varying sizes and dimensions depending on the size, location, and existing conditions in each mitigation unit. For example, the 7 acres of vegetation clearing in the preceding example would be distributed across the parcel in a patch pattern with areas not cleared interspersed with the cleared areas. Patches of existing native vegetation would be avoided and retained. Type 2 rehabilitation areas will not be cleared initially because successional development is expected to provide the increase in native cover required by Year 10. If, during the monitoring period, Type 2 mitigation units are not moving toward achieving the Year 10 performance standards, vegetation clearing may occur in Type 2 mitigation units to allow supplemental planting, and seeding may be implemented.

Vegetation clearing associated with invasive plants will involve intensive control methods implemented to eradicate or reduce the population of nonnative grasses and forbs in each planting unit. Repeated treatments are expected to be necessary and will be provided as needed. Treatment methods may include one or more of the following: mowing, string trimming, manual removal, burning, and herbicide treatments (if permitted). Mulching using a synthetic fabric may be considered if other techniques are not effective in controlling undesirable species. Disking and other soil-disturbing methods will not be used.

Nonchemical methods for invasive plant control are preferred over chemical methods. If chemical methods are used, chemicals (herbicides) will be applied under the direction of a licensed herbicide applicator and in strict accordance with all applicable regulations for their use.

Debris such as old fencing, agriculture implements, and other trash will be removed from the site during site preparation.

SEEDING

Wetland seed mixes consisting of native grasses and forbs will be used in the planting units, on a site-by-site basis, to seed rehabilitated wetlands. The seed mixes for each wetland rehabilitation parcel are provided in Appendix E. Seed mixes may be applied to all Type 3, Type 4, and Type 5 rehabilitation areas. Type 2 rehabilitation areas will not be seeded initially because successional development is expected to provide the increase in native cover required by Year 10. If, during the monitoring period, Type 2 mitigation units are not trending toward achieving the Year 10 performance standards, a seeding program may be implemented.

Vegetation surveys were performed in spring 2012 at each mitigation unit (prior to implementing mitigation actions) to confirm existing species composition and relative cover values. Based on this information, the parcel-specific seed mixes in Appendix E may be refined for each mitigation unit. The seed mixes will be applied using a drill seeder during early fall following completion of vegetation clearing and prior to container plant installation.

PLANTING

Planting of native herbaceous and woody species will occur in Type 3, Type 4, and Type 5 mitigation units. Plant palettes have been developed for each type based on wetland delineation vegetation data, CRAM data collected in spring 2011, August 2010 vegetation surveys at the wetland establishment parcels, and other field observations. The plant palettes for each mitigation unit parcel are shown in Appendix E. Vegetation surveys were performed in spring 2012 at each mitigation unit (prior to implementing mitigation actions) to confirm existing

species composition and relative cover values. Based on this information, the plant palettes in Appendix E may be refined for each rehabilitation area.

Type 2 rehabilitation areas will not be planted initially because successional development is expected to provide the increase in native cover required by Year 10. If, during the monitoring period, Type 2 mitigation units are not trending toward achieving the Year 10 performance standards, a planting program may be implemented in Type 2 mitigation units.

HERBACEOUS WETLAND CONTAINER PLANT INSTALLATION

Wetland container plants (native wetland herbaceous species) will be planted in the winter after vegetation clearing on the offsite mitigation units has been completed and rainfall has saturated the soil to a depth of approximately 10 inches. Container plants will be propagated and installed as described in Section 7.2.4, Plant Stock Collection and Installation, and in this section. Wetland seeding will be performed prior to plant installation.

Container plants will consist of tree band or equivalent size container stock. Container plants will be installed in clusters in the planting units. Container plants will be installed in a planting hole that is twice the width of and no deeper than the container. Soil removed when the planting hole is created will be used as backfill. Watering basins or bark mulch will not be required for wetland container plants.

Container plants will be placed in the planting hole so that the root collar is slightly above the desired final grade, with the top of the first major root barely visible at the surface. The plant will be watered immediately after planting and will be inspected after initial watering to ensure that settling has not occurred. Any container plants that have settled will be adjusted so the appropriate length is exposed aboveground.

WOODY PLANT SPECIES CONTAINER PLANT INSTALLATION

Container plants will be installed in the Type 3, Type 4, and Type 5 wetland rehabilitation areas that currently are vegetated by herbaceous vegetation. Container plants of woody plant species will be planted in the winter after vegetation clearing on the offsite wetland rehabilitation areas has been completed and rainfall has saturated the soil to a depth of approximately 10 inches. Container plants will be installed as described in Section 7.2.4, Plant Stock Collection and Installation, and in this section. The Type 3, 4, and 5 plant palettes are shown in the design plans for offsite mitigation (Appendix E). Wetland seeding will be performed prior to plant installation.

Container plants will consist of trees, shrubs, and vines. The plant forms may vary by mitigation unit based on site-specific conditions (e.g., in some units only tree species may be planted). The plants will be installed in a random, natural pattern. Container plants will be installed in a planting hole that is twice the width of and no deeper than the container. Soil removed when the planting hole is created will be set aside for use as backfill. Container plants will be placed in the planting hole so that the root collar is slightly above the desired final grade with the top of the first major root barely visible at the surface. The plants will be watered immediately after planting and will be inspected after watering to ensure that settling has not occurred. Plants that have settled will be adjusted so that the appropriate length is exposed aboveground.

Watering basins will be constructed around all container plants, and plant protection cages may be installed to minimize herbivory. A 3-inch layer of bark mulch (this mulch could come from chipped woody vegetation removed as part of vegetation clearing activities [Section 7.2.1.3, Vegetation Clearing]) will be placed in each watering basin to reduce soil evaporation rates and help suppress weed growth.

Riparian Cutting Collection and Installation

Willow and cottonwood cuttings will be installed in the Type 5 wetland rehabilitation areas that occur on streambanks or in wet meadows adjacent to streams and drainages (Appendix E). Cutting collection and installation will occur in December and/or January. Seeding will be performed in the fall prior to cutting installation. Cuttings will be collected and installed as described in Section 7.2.4.2, Riparian Cutting Collection and Installation, and in this section. The schedule for collection and installation may need to be adjusted depending on the level of inundation for that fall/winter, which could impede access and installation procedures.

All cuttings will be hardened-off green wood. Cuttings will be a minimum of 3 feet long and will be tapered from a minimum of 0.5 inch to a maximum of 2.5 inches in diameter. Cuttings will be cut at a right angle at the wide end of the cutting.

Immediately after harvesting, the leaves, branches, and twigs will be carefully removed from each cutting to avoid damage to buds on the cutting. The cuttings then will be wrapped in burlap or other approved material that protects them from sunlight and allows air circulation within the bundle. The bundled cuttings will be maintained in cool wet storage until just before planting and will be planted within 24 hours of collection.

Planting holes will be excavated for all cuttings. Cuttings will be installed vertically, with the narrow end exposed and two thirds of the cutting buried belowground to ensure the development of adequate root mass. Fertilizer will not be applied during cutting installation. Watering basins

will be constructed around cuttings, and plant protection cages may be installed to minimize herbivory. A 3-inch layer of bark mulch (this mulch could come from chipped woody vegetation removed as part of vegetation clearing activities [Section 7.2.1.3, Vegetation Clearing]) will be placed in each watering basin to reduce soil evaporation rates and help suppress weed growth.

Cuttings will be watered immediately after planting and will be inspected after watering to ensure that they have not settled. Any cuttings that have settled will be adjusted so the appropriate length is exposed aboveground.

ACORN COLLECTION AND INSTALLATION

Caltrans will collect acorns to be planted at the mitigation units. Acorns will be collected and installed as described in Section 7.2.4.3, Acorn Collection and Installation, and in this section. Wetland seeding will be performed prior to acorn installation.

PLANT WATERING

Plant watering will be provided for woody and herbaceous plantings (excluding seeded areas) in the wetland rehabilitation areas as needed, determined based on plant vigor during the summer months. Plantings will not be watered if maintenance inspections show they are being supported sufficiently by seasonal water availability. The goal of watering will be to provide sufficient water to successfully establish deep-rooted plants that are able to survive without supplemental irrigation. Caltrans will water plantings as needed during the 3-year plant establishment maintenance period. Possible irrigation methods are described in Section 7.2, Onsite Mitigation Implementation, and watering frequency and application rates are described in Chapter 8, "Mitigation Maintenance Plan."

CONSTRUCTION INSPECTIONS

Caltrans will inspect progress of the mitigation efforts to ensure that offsite mitigation is fully and properly completed. Areas not meeting the implementation standards identified will be reevaluated and replanted as necessary. At a minimum, Caltrans will perform inspections at the following critical stages of mitigation implementation.

- Layout of proposed wetland rehabilitation unit boundaries prior to construction.
- Placement and installation of ESA fencing.
- Installation of erosion control measures and use of BMPs.
- Site preparation and vegetation clearing operations.

- Irrigation system installation (if applicable) and initial plant watering.
- Seeding and planting operations.

AS-BUILT CONDITIONS DOCUMENTATION

Within 45 days from the completion of wetland rehabilitation efforts, Caltrans will submit a complete set of as-built drawings to the resource agencies. The as-built drawings will be prepared using MicroStation (version 7 or later) software and will be at the same scale as the construction drawings. The as-built drawings will be prepared following standard landscape architecture protocols and practices. The as-built drawings will depict the features listed below.

- Wetland rehabilitation boundaries, including planted and seeded areas.
- Updated plant palettes, including species, plant material type (e.g., tree band, 1-gallon, cutting, acorn), and number of plants planted by species.
- Updated seed mix, including application rates.
- Plant watering method (if applicable), including water source identification and delivery system design, and application rates.
- Fences, gates, and access roads.
- Other pertinent mitigation features.

ENHANCEMENTS TO WETLANDS

The techniques used for grazed and ungrazed wetland rehabilitation strategies, as well as certain techniques associated with wetland establishment, enhance wetlands in the following ways.

IMPROVE HYDROLOGY

As previously described in this MMP, numerous drainages throughout Little Lake Valley drain wet meadows to allow more efficient and extensive grazing of pastureland. These drainages often are interconnected and flow to the lowest point on the parcel, where they exit the parcel onto another parcel or into an adjacent stream. In addition to draining surface water from the wet meadow more quickly than under natural conditions, the drainages also dewater adjacent wetland habitat, thereby potentially affecting adjacent wetland plant communities. Some disturbed drainages are unvegetated and show signs of channel bed and bank erosion (usually in the form of headcuts). These unstable areas may contribute sediment to adjacent streams.

Parcel hydrology will be improved by modifying these drainages, usually as part of grading for the proposed wetland establishment sites (see mitigation construction plans and special

provisions for grading plans). As a result, water that previously would have left the site as runoff will have a longer residence time and will be retained as surface flow or as shallow groundwater or saturated soil. This action may also result in an increase in groundwater recharge.

Improvement of parcel hydrology through the modification of drainages is proposed at the Goss/MGC Plasma Middle/MGC Plasma North parcels.

At the Goss/MGC Plasma Middle/MGC Plasma North offsite mitigation parcels, existing incised drainages that drain surface water from these parcels into adjacent drainages will be graded as part of grading for the proposed wetland establishment site to retain water and increase the residence time of water on the parcels (see mitigation construction plans and special provisions for grading plans).

INCREASE HABITAT COMPLEXITY

Wetland rehabilitation actions will provide connectivity with existing wet meadows and other habitat types, provide increased edge effect with wet meadow and other habitats, and increase habitat complexity and structure. Habitat complexity will be increased by planting native woody and herbaceous species and controlling nonnative vegetation. Although wet meadow provides unique habitat benefits, it has relatively low habitat complexity compared to riparian wetland. Wetland rehabilitation will result in a gain in aquatic resource function but not in aquatic area.

As previously described, five types of wetland rehabilitation have been developed. With the more aggressive strategies (Types 3–5), wetland rehabilitation will include clearing patches of nonnative wetland vegetation and replanting and seeding with native woody and herbaceous wetland species. In addition to planting and seeding, some level of successional development is part of each rehabilitation type in untreated areas of the Type 3–5 rehabilitation areas. Successional development alone will be the initial rehabilitation strategy for Type 2 rehabilitation areas.

- Increased habitat complexity in the Type 2 wetland rehabilitation areas is anticipated to be provided by successional development. The mitigation units will be monitored to ensure that there is no decrease in native plant cover or an influx of invasive plant species. Remedial planting and seeding will occur in the Type 2 mitigation units if the performance standards are not achieved.
- Type 3–5 wetland will be seeded and planted with native herbaceous wetland and native woody species. The addition of woody vegetation to the Type 3–5 rehabilitation areas will provide connectivity to adjacent or nearby riparian and oak woodland and tree lines that occur along fence lines, increased edge effect between herbaceous and woody vegetation–

dominated habitat, and vertical habitat structure (tree and shrub canopy) not provided by wet meadows.

INCREASE NATIVE PLANTS

Existing wetlands will be rehabilitated by planting and seeding native herbaceous wetland species and native woody species. Planting of woody vegetation in existing wet meadow habitat adjacent to streams will result in a type change to riparian wetland or provide structural diversity by establishing an open woodland/savanna vegetation community. In several locations woody riparian vegetation is becoming established in wet meadow or marsh. For example, on the Brooke parcels, where grazing has been eliminated, Oregon ash and other riparian species are becoming established. Riparian planting will expedite this succession change. Grazing management, discussed below, also contributes to this enhancement benefit.

DECREASE INVASIVE PLANTS

Some targeted treatment of invasive plant species will be performed to reduce the extent of infestations and to improve control of the species in the future. For example, teasel and poison hemlock are the dominant herbaceous species in the marsh on the northern Brooke parcels. Following initial control of these invasive species through manual, mechanical, or chemical control methods, the marsh will be planted with riparian plants to convert it to riparian wetland. Because teasel occurs in open, sunny areas, the conversion of emergent wetland to riparian wetland eventually will reduce the prevalence and/or presence of this species in this planting area. Poison hemlock also occurs in open, sunny areas but occasionally is found in riparian habitat. Conversion of emergent wetland to riparian wetland eventually will reduce the prevalence and/or presence of this species in this planting area. Beyond the targeted effort, invasive plants will be controlled to meet performance standards.

INCREASE RESOURCE-SENSITIVE GRAZING MANAGEMENT

Current grazing practices on the offsite mitigation parcels have reduced the establishment of riparian species and have led to the degradation of wetlands, streams, and drainages. Bank erosion along valley streams, and headcutting and channel incision in existing wet meadow and upland/grassland, occur on some of the offsite mitigation parcels. Implementation of the wetland habitat rehabilitation actions proposed, including a grazing management plan, will help increase plant species growth and will address bank erosion, headcutting, and channel incision on the offsite mitigation parcels.

As described previously in this MMP, riparian wetland was once a dominant land cover type in Little Lake Valley. Grazing has affected the ability of riparian wetland plant species to reproduce

and reach maturity. Although some riparian and oak seedling establishment was observed on the offsite mitigation parcels, growth has been significantly suppressed by cattle grazing. In many locations, no woody understory exists beneath an aging overstory of riparian and oak trees.

Grazing in wet meadows also may affect wetland habitat diversity and species richness. For example, in the northern portions of the valley, grazing has resulted in the suppression and disturbance of tule growth. Other effects may include the disturbance or elimination of wetland habitat, including habitat for special-status plant species.

Caltrans has developed a grazing management plan for the offsite mitigation parcels (Appendix Q). The adaptive management component of the mitigation program (Chapter 12) includes flexibility to adjust the grazing plan on a pasture-by-pasture basis to reflect the influence of seasonal variations and site-specific conditions.

7.3.3.5 RIPARIAN ESTABLISHMENT

Riparian habitat will be established in portions of the Category I, II, and III Riparian Corridors that currently do not support woody riparian vegetation. The riparian establishment areas, depending on location, will be adjacent to existing riparian habitat in the riparian corridors or the stream channels. The locations of the riparian establishment areas are shown in Appendix C.

Riparian establishment will include site preparation to clear the planting area of ruderal vegetation; installation of acorns, container plants, and cuttings; and installing an irrigation system (if necessary). Riparian establishment areas will be excluded from grazing because of a mitigation requirement imposed by the State agencies.

Table 7-2 lists riparian establishment strategies and corresponding actions to implement these strategies. Offsite riparian establishment will entail the following activities, discussed below.

- Site preparation
- Planting
- Plant watering
- Construction inspections
- Documentation of as-built conditions

SITE PREPARATION

Preparation of riparian establishment areas will entail the following activities, discussed below.

- Surveying and staking establishment areas
- Installing ESA protective fencing
- Installing erosion control measures and using BMPs
- Vegetation and site clearing

Surveying and Staking Mitigation Riparian Establishment Areas

Prior to mitigation construction, the limits of the riparian establishment areas, including staging areas and access roads, will be surveyed and staked. These locations will be based on the mitigation construction plans and specifications for contractor use (Appendices E and F).

Environmentally Sensitive Area Fencing

Prior to construction, Caltrans will install protective fencing and, where necessary, silt fencing around ESAs to be avoided. Protective fencing will consist of orange plastic-mesh fencing that is secured to metal T-posts and will be installed in accordance with the project construction documents. Silt fencing may be installed around avoided wetlands, other waters, and riparian habitat to prevent soil or sediment from entering the habitat. Silt fencing may be used in combination with protective fencing and will be installed in accordance with the project's SWPPP to be prepared by the contractor and with project BMPs. The BMPs will be those specified in the updated MRP to be prepared by NCRWQCB and/or those specified in the project construction documents.

Installing Erosion Control Measures and Using Best Management Practices

Implementation of the mitigation will require a SWPPP. Specific erosion control measures and BMPs will be provided in the document. Caltrans will review the contractor-prepared SWPPP for compliance with the mitigation construction plans and special provisions. The SWPPP then will be submitted to the NCRWQCB for approval. The following typical erosion control measures and BMPs have been identified in the mitigation construction plans and special provisions. These measures will be employed during site preparation and construction efforts and remain in place until ground-disturbing activities have ended (not an exhaustive list).

- Prior to the start of construction activities, all personnel will receive water pollution–control training.
- A temporary construction entrance will be installed and maintained to provide temporary access to the mitigation construction areas.

- Temporary fiber rolls will be installed and maintained around areas in which grading activities will occur to reduce sedimentation.
- Exposed slopes will be hydroseeded upon completion of construction activities to reduce erosion and sedimentation.
- Materials will be delivered, used, and stored in a way that minimizes or eliminates discharge of material into watercourses.
- Fueling, lubrication, maintenance, storage and staging of vehicles and equipment will be at east 150 feet beyond waters of the U.S and the State with the exception of cranes and stationary equipment, which will only be refueled using a company certified by the CDFG.
- Material stockpiles will be covered with plastic sheeting or geosynthetic fabric when not in use and surrounded with a linear sediment barrier, and/or placed on pallets.
- Wastewater from invasive species control an equipment washing must be disposed of at an appropriately permitted facility or comply with the proper NPDES requirements for discharges. Wastewater from vehicle cleaning will not be allowed for on-site use for any purposes unless it is demonstrated to the satisfaction of the NCRWQCB that it has been adequately treated for potential pollutants and invasive species.
- Spill- and leak-prevention procedures will be implemented for chemicals and hazardous substances stored at the mitigation construction site.
- Trash and debris will be removed from the job site at least once per week and will not be allowed to accumulate.

VEGETATION AND SITE CLEARING

The extent of vegetation and site clearing at a given mitigation unit will vary depending on the presence and density of nonnative species and debris. Intensive vegetation control methods will be implemented to eradicate or reduce the populations of some nonnative species. Repeated treatments are expected to be necessary and will be provided as needed. Treatment methods may include one or more of the following: mechanical removal, manual removal, and herbicide treatments (if permitted). Disking and other soil disturbing methods will not be used.

Nonchemical methods for invasive plant control are preferred over chemical methods. If chemical methods are used, chemicals (herbicides) will be applied under the direction of a licensed herbicide applicator and in strict accordance with all applicable regulations for their use.

If vegetation clearing is necessary during the migratory bird nesting season, a qualified biologist will conduct preconstruction surveys to identify active nests, and the appropriate species-specific avoidance and minimization measures will be implemented where practical.

A riparian seed mix consisting of native grasses and forbs will be used to seed areas disturbed by establishment of riparian and oak woodland habitat. The seed mix may be revised based on seed availability at the time of mitigation construction and seed application.

The riparian seed mix will be applied during early fall following completion of mitigation grading to reduce erosion. Riparian and oak woodland seeding will occur before installing riparian cuttings and riparian and oak container plants.

PLANTING

All riparian establishment areas will be planted with native trees, shrubs, and vines. The plant palettes for the riparian establishment areas are shown in Appendix E. Plantings will be collected and installed as container stock, cuttings, or acorns and will be installed as described in Section 7.2, Onsite Mitigation Implementation.

The planting density for riparian establishment planting areas will vary based on soil texture and soil moisture conditions as well as proximity to the nearest creek. Riparian planting areas on relatively high terraces may be composed primarily of oaks that will be planted at approximately 20 feet on center. Riparian plantings on more mesic planting surfaces will be approximately 10 feet on center. The plantings will be installed in a random, natural pattern.

Caltrans will contract with a plant nursery experienced with the propagation of native herbaceous wetland plants to propagate container plants for mitigation efforts. Planting stock for wetland habitat will be propagated and planted as described in Section 7.2.4.1, Container Plant Propagation and Installation, and in the paragraphs below.

Riparian establishment will include planting riparian vegetation in a band on each side of designated stream corridors. In some locations patches of nonnative vegetation will be cleared and the areas replanted with native species. The location for individual plantings will be identified using pin flags. Each species will be assigned a specific flag color to ensure that plant material is planted at the proper location.

PLANT WATERING

Woody plantings in the riparian establishment areas will be watered, as needed, based on plant vigor during the summer months. The goal of watering will be to provide sufficient water to

successfully establish deep-rooted plants that are able to survive without supplemental irrigation. Caltrans will water woody plantings as needed during the 3-year plant establishment maintenance period. Possible irrigation methods are described in Section 7.2, Onsite Mitigation Implementation, and watering frequency and application rates are described in Chapter 8, "Mitigation Maintenance Plan."

CONSTRUCTION INSPECTIONS

Caltrans will conduct progress inspections of the mitigation efforts to ensure that riparian establishment mitigation is fully and properly completed. Areas not meeting the implementation standards identified above will be reevaluated and replanted as necessary.

At a minimum, Caltrans will perform inspections at the following critical stages of mitigation implementation for the riparian establishment planting areas.

- Layout of proposed riparian establishment unit boundaries prior to construction.
- Placement and installation of ESA fencing.
- Installation of erosion control measures and use of BMPs.
- Site preparation and vegetation clearing operations.
- Irrigation system installation (if applicable) and initial plant watering.
- Planting operations.

AS-BUILT CONDITIONS DOCUMENTATION

Within 45 days from the completion of riparian establishment efforts, Caltrans will submit a complete set of as-built drawings to the resource agencies. The as-built drawings will be prepared using MicroStation (version 7 or later) software and will be at the same scale as the construction drawings. The as-built drawings will be prepared following standard landscape architecture protocols and practices. The as-built drawings will depict the features listed below.

- Riparian establishment boundaries, including planted and seeded areas.
- Updated plant palettes, including species, plant material type (e.g., tree band, 1-gallon, cutting, acorn), and number of plants planted by species.
- Plant watering method (if applicable), including water source identification and delivery system design, and application rates.
- Fences, gates, and access roads.

- Other pertinent mitigation features.

ENHANCEMENTS TO RIPARIAN HABITAT

The techniques used for riparian establishment enhance existing riparian habitat and other waters (stream channels) in the Category I–III Riparian Corridors in the following ways.

EXPAND HABITAT

Riparian establishment actions—installing riparian plants within Category I, II, and III Riparian Corridors adjacent to existing riparian habitat along stream corridors—will result in an increase in riparian habitat patch size. Riparian habitat in Little Lake Valley provides habitat for common and special-status wildlife species. Willow flycatcher, yellow warbler, and yellow-breasted chat are riparian-dependent, special-status species that breed in Little Lake Valley and would benefit from an expansion of riparian habitat.

INCREASE HABITAT COMPLEXITY

Most of the riparian establishment actions described in this section will result in an increase in the overall acreage of riparian woodland habitat on the offsite mitigation parcels, provide connectivity with existing riparian and oak woodland habitat, provide increased edge effect with wet meadow and other habitats, and increase habitat complexity and structure. Habitat complexity also is anticipated to be increased by discontinuing grazing management practices in riparian corridors to allow recruitment and establishment of native riparian plant communities.

INCREASE NATIVE PLANTS

The presence of native plants on the mitigation properties will be increased by planting riparian species along riparian corridors. Riparian plantings along streams or adjacent to existing riparian habitat will supplement senescent vegetation, maintain or increase shade, and provide more overhead structure and diversity.

REDUCE INVASIVE PLANTS

Targeted treatment of invasive plant species will occur if such species are present in the riparian establishment areas. Invasive species, as related to this project, are defined in Chapter 8. Following initial control of these species through manual, mechanical, or chemical control methods, the riparian establishment areas will be planted with wetland and riparian plants.

7.3.3.6 RIPARIAN REHABILITATION

Riparian habitat will be rehabilitated in portions of the Category I, II, and III Riparian Corridors that currently support woody riparian vegetation. The riparian rehabilitation areas, depending on location, may be adjacent to the riparian establishment areas or the stream channels. The locations of the riparian rehabilitation areas are shown in Appendix C.

Riparian rehabilitation will be accomplished by excluding cattle from riparian corridors and widening the corridors by planting additional riparian vegetation (Appendix C and Table 6-6). Table 7-2 lists riparian rehabilitation strategies and corresponding actions to implement these strategies. Offsite riparian rehabilitation will entail the following activities, discussed below.

- Site preparation
- Fence installation
- Construction inspections
- Documentation of as-built conditions

SITE PREPARATION

Preparation of riparian rehabilitation areas will entail installing ESA protective fencing. if areas are susceptible to disturbance during adjacent riparian establishment activities.

ENVIRONMENTALLY SENSITIVE AREA FENCING

Prior to construction, Caltrans will install protective fencing and, where necessary, silt fencing around ESAs to be avoided. Protective fencing will consist of orange plastic-mesh fencing that is secured to metal T-posts and will be installed in accordance with the project construction documents. Silt fencing may be installed around avoided wetlands, other waters, and riparian habitat to prevent soil or sediment from entering the habitat. Silt fencing may be used in combination with protective fencing and will be installed in accordance with the project's SWPPP to be prepared by the contractor and with project BMPs. The BMPs will be those specified in the updated MRP to be prepared by NCRWQCB and/or those specified in the project construction documents.

FENCE INSTALLATION

Cattle exclusion fence will be installed at the locations shown in Appendix E. Detailed drawings and information pertaining to fence materials and construction are shown in Appendix E. All fence material will be new and will be installed per Caltrans' standard fence design.

CONSTRUCTION INSPECTIONS

Caltrans will conduct progress inspections of the mitigation efforts to ensure that riparian rehabilitation mitigation is fully and properly completed. Areas not meeting the implementation standards identified above will be reevaluated and replanted as necessary.

At a minimum, Caltrans will perform inspections at the following critical stages of mitigation implementation for the riparian rehabilitation areas.

- Placement and installation of ESA fencing.
- Fence installation.

AS-BUILT CONDITIONS DOCUMENTATION

Within 45 days from the completion of riparian rehabilitation efforts, Caltrans will submit a complete set of as-built drawings to the resource agencies. The as-built drawings will be prepared using MicroStation (version 7 or later) software and will be at the same scale as the construction drawings. The as-built drawings will be prepared following standard landscape architecture protocols and practices. The as-built drawings will depict the features listed below.

- Riparian rehabilitation boundaries.
- Fences, gates, and access roads.
- Other pertinent mitigation features.

The techniques used for riparian rehabilitation will provide land management improvements that will exclude cattle from existing riparian vegetation and allow the expansion and successional development of riparian habitat.

7.3.3.7 OTHER WATERS REHABILITATION

Other waters habitat will be rehabilitated on several of the offsite mitigation parcels. The other waters rehabilitation areas will be located along Category I–III Riparian Corridors.

Other waters rehabilitation that will take place on the offsite mitigation properties includes the following actions.

- Planting riparian species on Category I–III Riparian Corridors (Appendix C).
- Implementing erosion and headcut repair features (Appendix E).
- Installing cattle exclusion fence along the corridors.

Table 7-2 lists rehabilitation strategies and corresponding actions to implement these strategies. The location of other waters habitat rehabilitation is shown in Appendices C, E, and F.

Offsite other waters rehabilitation will entail the following activities, discussed below.

- Site preparation
- Grading
- Planting
- Plant watering
- Construction inspections
- Documentation of as-built conditions

SITE PREPARATION

Preparation of offsite other waters rehabilitation areas will entail the following activities, discussed below.

- Surveying and staking rehabilitation areas.
- Installing ESA protective fencing.
- Installing erosion control measures and using BMPs.
- Vegetation and site clearing.

SURVEYING AND STAKING MITIGATION REHABILITATION AREAS

Prior to mitigation construction, the limits of the rehabilitation areas, including staging areas and access roads, will be surveyed and staked. These locations will be based on the mitigation construction plans and specifications for contractor use (Appendices E and F).

ENVIRONMENTALLY SENSITIVE AREA FENCING

Prior to construction, Caltrans will install protective fencing and, where necessary, silt fencing around ESAs to be avoided. Protective fencing will consist of orange plastic-mesh fencing that is secured to metal T-posts and will be installed in accordance with the project construction documents. Silt fencing may be installed around avoided wetlands, other waters, and riparian habitat to prevent soil or sediment from entering the habitat. Silt fencing may be used in combination with protective fencing and will be installed in accordance with the project's SWPPP (to be prepared by the contractor) and with project BMPs. The BMPs will be those

specified in the updated MRP to be prepared by NCRWQCB and/or those specified in the project construction documents.

Installing Erosion Control Measures and Using Best Management Practices

Implementation of the mitigation will require a SWPPP. Specific erosion control measures and BMPs will be provided in the document. Caltrans will review the contractor-prepared SWPPP for compliance with the mitigation construction plans and special provisions. The SWPPP then will be submitted to the NCRWQCB for approval. The following typical erosion control measures and BMPs have been identified in the mitigation construction plans and special provisions. These measures will be employed during site preparation and construction efforts and remain in place until ground-disturbing activities have ended (not an exhaustive list).

- Prior to the start of construction activities, all personnel will receive water pollution–control training.
- A temporary construction entrance will be installed and maintained to provide temporary access to the mitigation construction areas.
- Temporary fiber rolls will be installed and maintained around areas in which grading activities will occur to reduce sedimentation.
- Exposed slopes will be hydroseeded upon completion of construction activities to reduce erosion and sedimentation.
- Materials will be delivered, used, and stored in a way that minimizes or eliminates discharge of material into watercourses.
- Fueling, lubrication, maintenance, storage and staging of vehicles and equipment will be at east 150 feet beyond waters of the U.S and the State with the exception of cranes and stationary equipment, which will only be refueled using a company certified by the CDFG.
- Material stockpiles will be covered with plastic sheeting or geosynthetic fabric when not in use and surrounded with a linear sediment barrier, and/or placed on pallets.
- Wastewater from invasive species control an equipment washing must be disposed of at an appropriately permitted facility or comply with the proper NPDES requirements for discharges. Wastewater from vehicle cleaning will not be allowed for on-site use for any purposes unless it is demonstrated to the satisfaction of the NCRWQCB that it has been adequately treated for potential pollutants and invasive species.
- Spill- and leak-prevention procedures will be implemented for chemicals and hazardous substances stored at the mitigation construction site.

- Trash and debris will be removed from the job site at least once per week and will not be allowed to accumulate.

VEGETATION AND SITE CLEARING

The extent of vegetation and site clearing at a given mitigation unit will vary depending on the presence and density of nonnative species and debris. Intensive vegetation control methods will be implemented to eradicate or reduce the populations of some nonnative species. Repeated treatments are expected to be necessary and will be provided as needed. Treatment methods may include one or more of the following: mechanical removal, manual removal, and herbicide treatments (if permitted). Disking and other soil disturbing methods will not be used.

Nonchemical methods for invasive plant control are preferred over chemical methods. If chemical methods are used, chemicals (herbicides) will be applied under the direction of a licensed herbicide applicator and in strict accordance with all applicable regulations for their use.

GRADING

Erosion and headcut repair sites will be graded as necessary according to the design plans in Appendix E. Further description of the grading activities related to the erosion and headcut repairs is found in Section 7.3.2, Mitigation Actions by Offsite Mitigation Parcel, under the properties of Benbow, Ford, Frost, and Lusher.

PLANTING

All other waters rehabilitation areas will be planted with native trees, shrubs, and vines. The plant palettes for the other waters rehabilitation areas are shown in Appendix E. Plantings will be collected and installed as container stock, cuttings, or acorns and will be installed as described in Section 7.2, Onsite Mitigation Implementation.

The planting density for other waters rehabilitation planting areas will vary based on soil texture and soil moisture conditions as well as proximity to the nearest creek. Riparian planting areas on relatively high terraces may be composed primarily of oaks that will be planted at approximately 20 feet on center. Riparian plantings on more mesic planting surfaces will be approximately 10 feet on center.

Caltrans will contract with a plant nursery experienced with the propagation of native herbaceous wetland plants to propagate container plants for mitigation efforts. Planting stock for wetland habitat will be propagated and planted as described in Section 7.2.4.1, Container Plant Propagation and Installation, and in the paragraphs below.

Other waters rehabilitation will include planting riparian vegetation in a band on each side of designated stream corridors. In some locations patches of nonnative vegetation will be cleared and the areas replanted with native species. The location for individual plantings will be identified using pin flags. Each species will be assigned a specific flag color to ensure that plant material is planted at the proper location.

PLANT WATERING

Woody plantings in the other waters rehabilitation areas will be watered, as needed, based on plant vigor during the summer months. The goal of watering will be to provide sufficient water to successfully establish deep-rooted plants that are able to survive without supplemental irrigation. Caltrans will water woody plantings as needed during the 3-year plant establishment maintenance period. Possible irrigation methods are described in Section 7.2, Onsite Mitigation Implementation, and watering frequency and application rates are described in Chapter 8, "Mitigation Maintenance Plan."

CONSTRUCTION INSPECTIONS

Caltrans will conduct progress inspections of the mitigation efforts to ensure that other waters rehabilitation mitigation is fully and properly completed. Areas not meeting the implementation standards identified will be reevaluated and replanted as necessary.

At a minimum, Caltrans will perform inspections at the following critical stages of mitigation implementation for the other waters rehabilitation planting areas.

- Layout of the planting area boundary.
- Placement and installation of ESA fencing.
- Installation of erosion control measures and use of BMPs.
- Site preparation and vegetation clearing operations.
- Irrigation system installation (if applicable) and initial plant watering.
- Seeding and planting operations.

Caltrans will perform inspections at the following critical stages of implementation for the headcut and bank erosion repair sites.

- Layout of proposed work area boundaries prior to construction.
- Placement and installation of ESA fencing.

- Installation of erosion control measures and use of BMPs.
- Site preparation and vegetation clearing operations.
- Grading operations, including inspection of design elevations.
- Placement and construction of in-channel and bank stabilization and stream improvement features.
- Irrigation system installation (if applicable) and initial plant watering.
- Planting operations.

AS-BUILT CONDITIONS DOCUMENTATION

Within 45 days from the completion of other waters rehabilitation efforts, Caltrans will submit a complete set of as-built drawings to the resource agencies. The as-built drawings will be prepared using MicroStation (version 7 or later) software and will be at the same scale as the construction drawings. The as-built drawings will be prepared following standard landscape architecture protocols and practices. The as-built drawings will depict the features listed below.

- Other waters rehabilitation boundaries, including planted areas.
- Updated plant palettes, including species, plant material type (e.g., tree band, 1-gallon, cutting, acorn), and number of plants planted by species.
- Plant watering method (if applicable), including water source identification and delivery system design, and application rates.
- Location of in-channel and bank stabilization and stream improvement features.
- Fences, gates, and access roads.
- Other pertinent mitigation features.

ENHANCEMENTS TO OTHER WATERS

The techniques used for other waters rehabilitation enhance other waters in the following ways.

IMPROVE HYDROLOGY

Parcel hydrology will be improved to rehabilitate other waters habitat by stabilizing eroding banks and some headcuts. If left untreated, these erosion features may lead to the direct loss of riparian habitat (bank repair sites) and contribute excessive sediment to the stream channel (bank repair and headcut sites).

DECREASE SEDIMENTATION

Other waters will be rehabilitated by reducing sedimentation by repairing and stabilizing multiple eroding banks and headcuts on Benbow, Ford, Frost, and Lusher parcels. More detailed descriptions of these erosion and headcut repairs are found in Section 7.3.2, Mitigation Actions by Offsite Mitigation Parcel, under the specific parcel.

EXPAND HABITAT

Other waters rehabilitation actions—installing riparian plants in Category I, II, and III Riparian Corridors adjacent to existing riparian habitat along stream corridors—will result in an increase in riparian habitat patch size. Riparian habitat in Little Lake Valley provides habitat for common and special-status wildlife species. Willow flycatcher, yellow warbler, and yellow-breasted chat are riparian-dependent, special-status species that breed in Little Lake Valley and would benefit from an expansion of riparian habitat.

INCREASE HABITAT COMPLEXITY

Most of the other waters rehabilitation actions described in this section will result in an increase in the overall acreage of riparian woodland habitat on the offsite mitigation parcels, provide connectivity with existing riparian and oak woodland habitat, provide increased edge effect with wet meadow and other habitats, and increase habitat complexity and structure. Habitat complexity will be increased by improving hydrology that will lead to prolonged ponding and soil saturation, which is anticipated to promote increased species richness through natural recruitment. Habitat complexity also is anticipated to be increased by discontinuing grazing management practices in riparian corridors to allow recruitment and establishment of native riparian plant communities.

INCREASE NATIVE PLANTS

The presence of native plants on the mitigation properties will be increased by planting riparian species along riparian corridors. Riparian plantings along streams or adjacent to existing riparian habitat will supplement senescent vegetation, maintain or increase shade, and provide more overhead structure and diversity.

REDUCE INVASIVE PLANTS

Targeted treatment of invasive plant species will occur if such species are present in the other waters rehabilitation areas. Invasive species, as related to this project, are defined in Chapter 8.

Following initial control of these species through manual, mechanical, or chemical control methods, the wetland rehabilitation areas will be planted with wetland and riparian plants.

7.3.3.8 OAK WOODLAND ESTABLISHMENT

Oak woodland habitat will be established on the Watson East mitigation parcel. The location of habitat establishment is shown in Appendix C and listed in Table 7-2. Oak woodland habitat establishment will include planting native tree, shrub, and vine species in upland areas.

Oak woodland establishment will entail the following activities, discussed below.

- Site preparation
- Planting
- Plant watering
- Construction inspections
- Documentation of as-built conditions

SITE PREPARATION

Preparation of the oak woodland establishment area will entail the following activities, discussed below.

- Surveying and staking the establishment area
- Installing ESA fencing
- Installing erosion control measures and using BMPs
- Vegetation and site clearing

SURVEYING AND STAKING MITIGATION ESTABLISHMENT AREAS

Prior to mitigation construction, the limits of the oak woodland establishment area, including staging areas, topsoil stockpiling areas, and access roads, will be surveyed and staked. The exact locations will be based on the mitigation construction plans and specifications for contractor use (Appendix E).

ENVIRONMENTALLY SENSITIVE AREA FENCING

Prior to construction, Caltrans will install protective fencing and, where necessary, silt fencing around ESAs to be avoided. Protective fencing will consist of orange plastic-mesh fencing that is

secured to metal T-posts and will be installed in accordance with the project construction documents. Silt fencing may be installed around avoided wetlands, other waters, and riparian habitat to prevent soil or sediment from entering the habitat. The project's contractor will prepare a SWPPP. The SWPPP will include all required BMPs. Silt fencing may be used in combination with protective fencing and will be installed in accordance with the SWPPP. The BMPs will be those specified in the updated MRP to be prepared by NCRWQCB and/or those specified in the project construction documents.

Installing Erosion Control Measures and Using Best Management Practices

Implementation of the mitigation will require a SWPPP. Specific erosion control measures and BMPs will be provided in the document. Caltrans will review the contractor-prepared SWPPP for compliance with the mitigation construction plans and special provisions. The SWPPP then will be submitted to the NCRWQCB for approval. The following typical erosion control measures and BMPs have been identified in the mitigation construction plans and special provisions. These measures will be employed during site preparation and construction efforts and remain in place until ground-disturbing activities have ended (not an exhaustive list).

- Prior to the start of construction activities, all personnel will receive water pollution–control training.
- A temporary construction entrance will be installed and maintained to provide temporary access to the mitigation construction areas.
- Temporary fiber rolls will be installed and maintained around areas in which grading activities will occur to reduce sedimentation.
- Exposed slopes will be hydroseeded upon completion of construction activities to reduce erosion and sedimentation.
- Materials will be delivered, used, and stored in a way that minimizes or eliminates discharge of material into watercourses.
- Fueling, lubrication, maintenance, storage and staging of vehicles and equipment will be at east 150 feet beyond waters of the U.S and the State with the exception of cranes and stationary equipment, which will only be refueled using a company certified by the CDFG.
- Material stockpiles will be covered with plastic sheeting or geosynthetic fabric when not in use and surrounded with a linear sediment barrier, and/or placed on pallets.
- Wastewater from invasive species control an equipment washing must be disposed of at an appropriately permitted facility or comply with the proper NPDES requirements for discharges. Wastewater from vehicle cleaning will not be allowed for on-site use for any

purposes unless it is demonstrated to the satisfaction of the NCRWQCB that it has been adequately treated for potential pollutants and invasive species.

- Spill- and leak-prevention procedures will be implemented for chemicals and hazardous substances stored at the mitigation construction site.
- Trash and debris will be removed from the job site at least once per week and will not be allowed to accumulate.

VEGETATION AND SITE CLEARING

Vegetation and site clearing at the oak woodland establishment area will occur at the individual planting locations and any soil disturbance associated with installation of an irrigation system (if applicable). Vegetation clearing will include mowing herbaceous vegetation to a height of 1–3 inches. Vegetation within a 6-foot-by-6-foot area around individual plantings will be removed to bare ground. Cut vegetation will be legally disposed of offsite at a landfill or other facility that accepts green waste.

Nonchemical methods for invasive plant control are preferred over chemical methods. If chemical methods are used, chemicals (herbicides) will be applied under the direction of a licensed herbicide applicator and in strict accordance with all applicable regulations for their use.

If vegetation clearing is necessary during the migratory bird nesting season, a qualified biologist will conduct preconstruction surveys to identify active nests, and the appropriate species-specific avoidance and minimization measures will be implemented where practical.

PLANTING

A plant palette has been developed for the oak woodland establishment area. A combination of container plants and acorns will be planted. The species lists are presented in Appendix E. Caltrans will contract with a plant nursery experienced with the propagation of native plants to propagate container plants for mitigation efforts. Planting stock for oak woodland habitat will be propagated and planted as described in Section 7.2.4.1, Container Plant Propagation and Installation, and in the paragraphs below.

Planting density for oak woodland establishment will be approximately 20 feet on center for oaks. Associated oak woodland plantings, such as understory plantings, may be planted in clusters or individually at a smaller spacing interval (e.g., 8 feet on center).

CONTAINER PLANT INSTALLATION

Oak woodland habitat container plants will consist of trees and shrubs (Appendix E). The plants will be installed in a random, natural pattern. Container plants will be installed in a planting hole that is twice the width of and no deeper than the container. Soil removed when the planting hole is created will be set aside for use as backfill. Container plants will be placed in the planting hole so that the root collar is slightly above the desired final grade with the top of the first major root barely visible at the surface. The plants will be watered immediately after planting and will be inspected after watering to ensure that settling has not occurred. Any plants that have settled will be adjusted so the appropriate length is exposed aboveground.

Watering basins will be constructed around all container plants, and plant protection cages will be installed to minimize herbivory. A 3-inch layer of bark mulch (this mulch could come from chipped woody vegetation removed as part of vegetation clearing activities [Section 7.2.1.3]) will be placed in each watering basin to reduce soil evaporation rates and help suppress weed growth.

ACORN INSTALLATION

Caltrans will collect acorns to be planted at the oak woodland establishment area. Acorns will be collected from source material using the following hierarchy: (1) Little Lake Valley, (2) Outlet Creek basin, and (3) Eel River watershed. Acorns will be collected from various source materials to ensure the genetic diversity and viability. Diseased or unhealthy source material will not be used.

The planting area will be scraped to loosen the top 1 inch of the soil. Three acorns will be planted at each planting area. Acorns will be placed horizontally in the center of the planting area, 0.5 inch to a maximum of 1 inch below finish grade, in a 9-inch equilateral triangle (Appendix E). Fertilizer will not be applied during acorn installation. Acorn plantings will be watered immediately after planting.

PLANT WATERING

The goal of watering will be to provide sufficient water to successfully establish deep-rooted plants that are able to survive without supplemental irrigation. Caltrans will water woody plants in the oak woodland establishment area after planting and during the postconstruction 3-year plant establishment maintenance period using an irrigation system, a water truck, or other appropriate method as necessary to ensure survival and meet performance standards. Watering frequency and application rates are discussed in Chapter 8. The need to water individual plants or

planting areas will be determined on a case-by-case basis (e.g., if a plant area remains saturated much of the year, plant watering may not be necessary).

The oak woodland establishment area may be truck-watered if the installation of an irrigation system may not be practical. If practical, a temporary drip irrigation system may be installed. Potential water sources are existing agricultural wells and City water lines. Water may be pulled directly from a well or water line or stored in large plastic tanks and pumped through a delivery system.

CONSTRUCTION INSPECTIONS

Caltrans will conduct progress inspections of the oak woodland establishment site to ensure that the mitigation is fully and properly completed. If the oak woodland establishment site does not meet the implementation standards identified above, the site will be reevaluated and replanted as necessary. At a minimum, Caltrans will perform inspections at the following critical stages of mitigation implementation.

- Layout of proposed oak woodland establishment boundaries prior to construction.
- Placement and installation of ESA fencing.
- Installation of erosion control measures and use of BMPs.
- Site preparation and vegetation clearing operations.
- Irrigation system installation (if applicable) and initial plant watering.
- Planting operations.

AS-BUILT CONDITIONS DOCUMENTATION

Within 45 days from the completion of oak woodland establishment efforts, Caltrans will submit a complete set of as-built drawings to the resource agencies. The as-built drawings will be prepared using MicroStation (version 7 or later) software and will be at the same scale as the construction drawings. The as-built drawings will be prepared following standard landscape architecture protocols and practices. The as-built drawings will depict the features listed below.

- Oak woodland establishment area, including planted areas.
- Updated oak woodland plant palettes, including species, plant material type (e.g., tree band, 1-gallon, cutting, acorn), and number of plants planted by species.
- Plant watering method, including water source identification and delivery system design, and application rates.

- Fences, gates, and access roads.
- Other pertinent mitigation features

ENHANCEMENTS TO OAK WOODLAND HABITAT

Oak woodland establishment provides the following enhancements.

INCREASED HABITAT COMPLEXITY

Oak woodland establishment will provide connectivity with existing riparian and oak woodland habitat, provide increased edge effect with wet meadow and other habitats, and increase habitat complexity and structure.

REDUCED INVASIVE PLANTS

Some targeted treatment of invasive plants will be performed in the oak woodland establishment area should invasive plants colonize the area.

7.3.3.9 PRESERVATION

Preservation, in the context of this MMP, refers to wetland habitat on the Huff parcel and oak woodland and oak woodland grassland habitat on the Taylor mitigation parcels (Appendix C).

The mitigation goals for the Huff parcel are wetland and other waters preservation. No establishment or rehabilitation actions will occur on this parcel. Grazing does not occur on this parcel under existing conditions and will not occur because it is inaccessible; it is bounded on all sides by a railroad alignment, US 101, and Outlet Creek. Caltrans will install exclusion fence or other exclusion methods to prohibit unauthorized use of this parcel in the future.

The mitigation goals for the Taylor parcels are oak woodland and oak woodland grassland preservation. No establishment or rehabilitation actions will occur on these parcels. Grazing occurs under existing conditions. Rotational grazing will be used to maintain or improve oak woodland habitat. Grazing management will occur on the entirety of the parcels. Grazing management comprises replacing and adding grazing infrastructure (e.g., fences and gates, water troughs) to support rotational grazing. The grazing management for these parcels is described in the grazing plan (Appendix Q).

Information regarding long-term management and adaptive management for the Huff and Taylor parcels is presented in Chapters 11 and 12, respectively. Sensitive biological resources and the mitigation actions for the parcels are shown in Appendix C.

Chapter 8 Mitigation Maintenance Plan

Maintenance of mitigation sites will consist of three distinct periods: plant establishment maintenance, short-term maintenance, and long-term maintenance. The first two periods, discussed in this chapter, will occur during the performance-monitoring period. Long-term maintenance, discussed in Chapter 11, will begin after the mitigation sites achieve their designated performance standards.

The performance-monitoring period is the period of time during which performance standards are being monitored (Chapter 9).

Both the onsite mitigation area and offsite mitigation properties will receive maintenance during the plant establishment and short-term periods. Only the offsite mitigation will receive long-term maintenance. The level of maintenance generally decreases with each period, in keeping with the goal to establish self-sustaining natural habitats. On the onsite mitigation area, Caltrans will conduct maintenance during the plant establishment and short-term periods. Caltrans will implement the offsite mitigation and perform the plant establishment maintenance for the offsite mitigation parcels, but the Land Manager will conduct short- and long-term maintenance. The Land Manager is also responsible for collecting all biological monitoring data during all three maintenance periods at the offsite mitigation properties.

8.1 Plant Establishment Maintenance Period

Plant establishment is the initial and most intensive maintenance period, beginning immediately after mitigation implementation activities are completed (Chapter 7). The plant establishment period is anticipated to last 3 years and will be performed by Caltrans or other suitable partner for the onsite mitigation and the Mitigation Contractor for offsite mitigation properties. Plant establishment maintenance generally includes the following tasks, which are described in detail in Section 8.3.

- Water mitigation plantings.
- Control invasive plants, as needed.
- Assess plant protection and health.
- Install replacement plants (as needed, based on monitoring results).
- Conduct general assessment.

8.2 Short-Term Maintenance Period

The short-term maintenance period will be performed by the Caltrans Mitigation Contractor for the offsite locations and either a Caltrans bypass construction contractor or other suitable partner for the onsite reestablishment areas. Onsite mitigation areas will be treated as a mitigation unit and will be maintained as one unit. The offsite mitigation project comprises multiple mitigation units, and each unit will be maintained individually.

The performance monitoring period will be 5 years for Group 1 wetland establishment mitigation units and 10 years for Group 2 wetland establishment and all wetland rehabilitation habitat, riparian establishment, and oak woodland establishment. The performance-monitoring period will determine the length of the short-term maintenance period for that parcel. For example, Group 1 established wetlands (which have a 5-year performance-monitoring period) would have a 2-year short-term maintenance period (5 years minus 3-year plant establishment period), whereas the Group 2 established wetlands and wetland rehabilitation areas (which have a 10-year performance-monitoring period) would have a 7-year short-term maintenance period.

Short-term maintenance is a less–labor intensive version of plant establishment maintenance. Most of the activities conducted in the plant establishment phase will continue, but they are performed less frequently than during plant establishment.

Short-term maintenance generally includes the following tasks, which are described in Section 8.3.

- Water mitigation plantings.
- Control invasive plants, as needed.
- Assess plant protection and health.
- Install replacement plants (as needed, based on monitoring results).
- Conduct supplemental seeding (as needed, based on monitoring results).
- Conduct general assessment.

8.3 Maintenance Activities

8.3.1 Water Mitigation Plantings

Mitigation plantings will be watered immediately after planting and during the first 3 years following initial planting (plant establishment period) to ensure survival and to achieve performance standards. Plant watering will occur at the following locations.

- Woody riparian and nonwoody plantings (excluding seeded areas) in the onsite reestablishment mitigation planting areas.
- Woody riparian and nonwoody plantings in the offsite riparian establishment planting areas (low through upper banks).
- Oak woodland planting in the oak woodland establishment area.

Depending on location, plants will be watered using a hose attachment on a water truck, by hand, or by a temporary drip irrigation system. The mitigation contractor will inspect the plantings to determine watering requirements; the approximate anticipated watering schedule is outlined below.

Plants will be watered weekly during Year 1 of the plant establishment period and twice monthly during Years 2 and 3. Because site conditions, accessibility, and potential water sources vary across the offsite mitigation parcels watering may include the design and installation of a temporary irrigation system, truck watering or hand watering. Water application rates will be species dependent and may be adjusted by the Mitigation Contractor depending on site-specific conditions. Maintenance inspections will be undertaken weekly during Year 1 and twice monthly during Years 2 and 3 to determine whether the annual watering schedule and water application rate require adjustment based on site-specific soil moisture conditions or landscape-level conditions. The Mitigation Contractor should provide routine irrigation system inspections (if an irrigation system is used) to evaluate overall condition and to ensure that the system is operational and water delivery is occurring at the targeted application rates.

It is anticipated that herbaceous wetland plantings in the reestablished, established, and rehabilitated wetlands will not be watered because they will be supported by seasonal inundation or soil saturation. Supplemental watering may be provided if the Mitigation Contractor determines that herbaceous wetland plantings are stressed and could be subject to extensive plant loss. Supplemental watering, if needed, likely would be needed only during the first year of the establishment period.

8.3.2 Control Weeds

Periodic removal of nonnative vegetation, including invasive species, will be required during the maintenance periods for the reestablishment, establishment, and rehabilitation areas. Weed control will be provided for three primary reasons: (1) weeds are in direct competition with individual desired plants for nutrients, water, and other resources; (2) weeds can affect the ability of a mitigation unit to meet the performance standards (e.g., relative percent cover by native species); and (3) weeds have the potential to take over a mitigation unit and spread into adjacent habitats.

As defined for this project, nonnative species to be controlled include weeds and invasive species. In brief, the MMP uses the following definitions for nonnative plant species, which will be used to define the maintenance and management actions for the control of weeds.

- *Weeds* are plants that grow in sites where they are not wanted and that usually have detectable economic or environmental effects (synonyms include pest plants, plants out of place, and prolific plants).
- The term *nonnative* is used for species that were directly or indirectly introduced by humans, were not present in the region before this introduction, and would not have spread into the area without human interference.
- *Invasive plants* are naturalized plants that produce reproductive offspring, often in very large numbers, at considerable distances from parent plants and thus have the potential to spread over a considerable area.

Standard landscape weed control measures (e.g., manual removal, herbicide application, grazing, burning, tarping) will be used to control weeds in the planting basins and planting areas that are competing or have the potential to compete with planted or seeded species for resources. Similar measures will be used to control a select list of invasive plants wherever they occur on the onsite and offsite mitigation parcels. Caltrans, in coordination with the resource agencies, developed a list of invasive species known or with the potential to occur in the mitigation areas (Table 8-1). The list was developed using invasive plant species identified by the California Invasive Plant Council (Cal-IPC) as a *high* or *moderate* threat of becoming established on the mitigation parcels. Additional species of local concern that do not occur on the CAL-IPC list also are included in Table 8-1. The plants listed in Table 8-1 are the species that are subject to the invasive species performance standard of no increase over baseline.

Before project implementation, the site functioned with a number of nonnative species, some of which have become naturalized. They are predominantly annual species that occur in grasslands.

It is unreasonable to require or expect eradication of established nonnative species at the site. The required management of nonnative plants therefore will be limited to the management of newly introduced invasive species and controlling the spread of existing invasive species that are listed in Table 8-1. Methods of removing or controlling these species are outlined below.

Hand/mechanical: Hand removal or use of small hand-powered or handheld equipment (such as a Weed Wrench or a chainsaw) always should be the preferred method of removing invasive species from the mitigation properties. If hand-removal methods are found ineffective, or the problem is too widespread for hand removal to be practical, mechanical methods (use of larger equipment with motors such as mowers) or biological controls as described below can be used.

Herbicides: When using chemical control methods, herbicides will be applied by hand or mechanical means, by the Land Manager or Qualified Personnel during the time of year and at an application rate that allows the least amount of herbicide use yet still eliminates the targeted species. Only herbicides that are approved for aquatic use will be used in or near aquatic areas. Mixing, loading, storing, and rinsing of equipment or containers will not take place in aquatic areas. BMPs that may be used to protect aquatic areas include, but are not limited to: (1) avoid applying herbicides under windy conditions; (2) use ground-based applicators, low tank pressures, and equipment calibration for larger droplet sizes; (3) avoid applying herbicides within 24 hours prior to, or during, rain.

Biological controls: The county agricultural commissioner would be the point of contact for use of biological controls in the mitigation properties. If biological control methods are tried and found ineffective or if biological control methods are not available for the target species, herbicides can be used, but only as outlined below.

8.3.2.1 WEED CONTROL IN MITIGATION PLANTING AREAS

Periodic removal of competing weedy vegetation will be required during the plant establishment and short-term maintenance periods. Weeds that are in direct competition with planted or seeded native vegetation and have the potential to displace or affect the vigor of desired species will be removed from the planting basins or in the immediate vicinity of mitigation plantings. Weed control techniques may include manual, mechanical, chemical, and biological control methods.

Table 8-1. CAL-IPC Invasive Plant Inventory Species Known or with Potential to Occur in the Willits Bypass Project Area

Cal-IPC: The Inventory Database Scientific Name	Common Name	CAL-IPC Rating	Wetland Indicator Status	Habitats of Concern and Comments
Aegilops triuncialis	Barb goatgrass	High	UPL	Grassland, oak woodland; spreading in NW and in Central Valley.
Agrostis stolonifera	Creeping bentgrass	Limited	NI	Wetlands, riparian; grown for domestic forage. Limited distribution and impacts unknown.
Ailanthus altissima	Tree-of-heaven	Moderate	UPL	Riparian areas, grasslands, oak woodland. Impacts highest in riparian areas.
Anthoxanthum odoratum	Sweet vernal grass	Moderate		
Arundo donax	Giant reed	High	NI	Riparian areas, commercially grown for musical instrument reeds, structural material, etc.
Asparagus asparagoides	Bridal creeper	Moderate	UPL	Riparian woodland.
Avena barbata	Slender wild oat	Moderate	UPL	Coastal scrub, grasslands, oak woodland, forest. Very widespread, but impacts more severe in desert regions.
Avena fatua	Wild oat	Moderate	UPL	Coastal scrub, chaparral, grasslands, woodland, forest. Very widespread, but impacts more severe in desert regions.
Brachypodium distachyon	Annual false brome	Moderate		
Brassica nigra	Black mustard	Moderate	UPL	Widespread. Primarily a weed of disturbed sites, but can be locally a more significant problem in wildlands.
Brassica rapa	Common mustard	Limited		

Table 8-1. Continued

Cal-IPC: The Inventory Database Scientific Name	Common Name	CAL-IPC Rating	Wetland Indicator Status	Habitats of Concern and Comments
Briza maxima	Big quackingrass, rattlesnakegrass	Limited	UPL	Grasslands. Widespread in Coast Range. Impacts generally minor, but locally can be higher.
Bromus diandrus	Ripgut brome	Moderate	UPL	Dunes, scrub, grassland, woodland, forest. Very widespread, but monotypic stands uncommon.
Bromus hordeaceus	Soft brome	Limited	UPL	Grasslands, sagebrush, serpentine soils, many other habitats. Very widespread, but primarily in converted annual grasslands.
Bromus madritensis ssp. rubens	Red brome	High	NI	Scrub, grassland, desert washes, woodlands.
Bromus tectorum	Downy brome, cheatgrass	High	UPL	Interior scrub, woodlands, grasslands, piñon/Joshua tree woodland, chaparral.
Carduus pycnocephalus	Italian thistle	Moderate	UPL	Forest, scrub, grasslands, woodland. Very widespread. Impacts may be variable regionally.
Centaurea maculosa	Spotted knapweed	High		Riparian, grasslands, wet meadows, forests. More widely distributed in other western states.
Centaurea melitensis	Malta starthistle, tocalote	Moderate	UPL	Grasslands, oak woodland; sometimes misidentified as *C. solstitialis*. Impacts vary regionally.
Centaurea solstitialis	Yellow starthistle	High	UPL	Grasslands, woodlands, occasionally riparian.
Chondrilla juncea	Rush skeletonweed	Moderate	UPL	Grasslands. Very invasive in other western states, but currently limited in distribution in CA.
Cirsium arvense	Canada thistle	Moderate	FAC	Grasslands, riparian areas, forests. Severe impacts in other western states. Limited distribution in CA.

Table 8-1. Continued

Cal-IPC: The Inventory Database Scientific Name	Common Name	CAL-IPC Rating	Wetland Indicator Status	Habitats of Concern and Comments
Cirsium vulgare	Bull thistle	Moderate	FACU	Riparian areas, marshes, meadows. Widespread, can be very problematic regionally.
Conium maculatum	Poison-hemlock	Moderate	FACW	Riparian woodland, grassland. Widespread in disturbed areas. Abiotic impacts unknown. Impacts can vary locally.
Cortaderia jubata	Jubatagrass	High		Many coastal and interior habitats.
Cortaderia selloana	Pampasgrass	High		Coastal dunes, coastal scrub, Monterey pine, riparian, grasslands, wetlands, serpentine soils. Still spreading both coastally and inland.
Crataegus monogyna	Hawthorn	Limited		
Cynodon dactylon	Bermudagrass	Moderate	FAC	Riparian scrub in southern CA. Common landscape weed, but can be very invasive in desert washes.
Cynosurus echinatus	Hedgehog dogtailgrass	Moderate	UPL	Oak woodland, grassland. Widespread, impacts vary regionally, but typically not in monotypic stands.
Cytisus scoparius	Scotch broom	High	UPL	Coastal scrub, oak woodland; horticultural varieties may also be invasive.
Dactylis glomerata	Orchardgrass	Limited	UPL	Grasslands, broadleaved forest, woodlands; common forage species. Impacts appear to be minor.
Delairea odorata	Cape-ivy, German-ivy	High		Coastal, occasionally other riparian areas, common discard from gardens.
Dipsacus fullonum	Common teasel	Moderate	NI	Grasslands, seep, riparian scrub. Impacts regionally variable, forms dense stands on occasion.

Table 8-1. Continued

Cal-IPC: The Inventory Database Scientific Name	Common Name	CAL-IPC Rating	Wetland Indicator Status	Habitats of Concern and Comments
Erodium cicurtarium	Red-stemmed filaree	Limited		
Festuca arundinacea	Tall fescue	Moderate	FAC -	Coastal scrub, grasslands; common forage grass. Widespread, abiotic impacts unknown.
Ficus carica	Edible fig	Moderate	UPL	Riparian woodland. Can spread rapidly. Abiotic impacts unknown. Can be locally very problematic.
Foeniculum vulgare	Fennel	High	UPL	Grasslands, scrub.
Genista monspessulana	French broom	High	NI	Coastal scrub, oak woodland, grasslands. Horticultural selections may also be invasive.
Geranium dissectum	Cut-leaf geranium	Moderate		
Hedera helix, H. canariensis	English ivy, Algerian ivy	High	UPL	Coastal forests, riparian areas. Species combined because of genetics questions.
Holcus lanatus	Common velvet grass	Moderate	FAC	Coastal grasslands, wetlands. Impacts can be more severe locally, especially in wetland areas.
Hordeum marinum, H. murinum	Mediterranean barley, hare barley, wall barley	Moderate	FAC	Grasslands; *H. marinum* invades drier habitats, while *H. murinum* invades wetlands. Widespread, but generally do not form dominant stands.
Hypericum perforatum	Common St. John's wort, klamathweed	Moderate	UPL	Many northern CA habitats. Abiotic impacts low. Biological control agents have reduced overall impact.
Hypochaeris glabra	Smooth catsear	Limited	UPL	Scrub and woodlands. Widespread. Impacts appear to be minor. Some local variability.

Table 8-1. Continued

Cal-IPC: The Inventory Database Scientific Name	Common Name	CAL-IPC Rating	Wetland Indicator Status	Habitats of Concern and Comments
Hypochaeris radicata	Rough catsear, hairy dandelion	Moderate	UPL	Coastal dunes, scrub, and prairie; woodland, forest. Widespread. Impacts unknown or appear to be minor.
Lepidium latifolium	Perennial pepperweed, tall whitetop	High	FACW	Coastal and inland marshes, riparian areas, wetlands, grasslands; potential to invade montane wetlands.
Leucanthemum vulgare	Ox-eyed daisy	Moderate		
Lolium multiflorum	Italian ryegrass	Moderate	FAC	Grasslands, oak woodland, piñon-juniper woodland; widely used for post-fire erosion control. Widespread. Impacts can vary with region.
Lythrum hyssopifolium	Hyssop loosestrife	Limited	FACW	Grasslands, wetlands, vernal pools. Widespread. Impacts unknown but appear to be minor.
Lythrum salicaria	Purple loosestrife	High		Wetlands, marshes, riparian areas.
Marrubium vulgare	White horehound	Limited	FAC	Grasslands scrub, riparian areas. Widespread. Rarely in dense stands. Impacts relatively minor.
Medicago polymorpha	California burclover	Limited	UPL	Grasslands. Widespread weed of agriculture and disturbed areas. Impacts in wildlands minor.
Mentha pulegium	Pennyroyal	Moderate	OBL	Vernal pools, wetlands. Poisonous to livestock. Spreading rapidly. Impacts largely unknown.
Onopordum acanthium	Scotch thistle	High		Wet meadows, sage brush, riparian areas.
Oxalis pes-caprae	Bermuda buttercup, buttercup oxalis, yellow oxalis	Moderate	UPL	Coastal dunes, scrub, oak woodland. Impacts in coastal areas may prove more severe in time.

Table 8-1. Continued

Cal-IPC: The Inventory Database Scientific Name	Common Name	CAL-IPC Rating	Wetland Indicator Status	Habitats of Concern and Comments
Parentucellia viscosa	Yellow glandweed, sticky parentucellia	Limited	NI	Coastal prairie, grassland, and dunes. Impacts unknown, but can be locally significant.
Phalaris aquatica	Harding grass	Moderate	FAC +	Coastal sites, especially moist soils. Limited distribution. Can be highly invasive locally.
Phalaris arundinacea	Reed canarygrass	N/A	OBL	Valley grassland, foothill woodland, chaparral, yellow pine forest, wetland-riparian habitat.
Phragmites australis	Common reed			BONAP, Biota of North America, shows this to be present in Mendocino County. Habitat exists in the project area.
Phytolacca americana	Common pokeweed	Limited	NI	Riparian forest, riparian woodland.
Picris echioides	Bristly oxtongue	Limited	FAC	Coastal prairie, scrub, riparian woodland. Widespread locally. Abiotic impacts unknown.
Plantago lanceolata	Buckhorn plantain, English plantain	Limited	FAC	Many habitats. Turf weed primarily. Low density and low impact in wildlands.
Poa pratensis	Kentucky bluegrass	Limited	UPL	Grasslands scrub, riparian areas. Widespread turf plant. Abiotic impacts unknown.
Polygonum cuspidatum	Japanese knotweed	Moderate	NI	Riparian areas, wetlands, forest edges. More severe impacts in NW wetlands. Distribution limited in CA.
Polypogon monspeliensis and spp.	Rabbit-foot grass, annual beardgrass	Limited	FACW +	Margins of ponds and streams, seasonally wet places, edge of coastal dunes. Widespread. Impacts appear to be minor.
Raphanus sativus	Radish	Limited		

Table 8-1. Continued

Cal-IPC: The Inventory Database Scientific Name	Common Name	CAL-IPC Rating	Wetland Indicator Status	Habitats of Concern and Comments
Rubus armeniacus	Himalaya blackberry	High	FACW	Riparian areas, marshes, oak woodlands.
Rumex acetosella	Red sorrel, sheep sorrel	Moderate	FAC	Many habitats, riparian areas, forest, wetlands. Widespread. Abiotic impacts unknown. Impacts can vary locally.
Rumex crispus	Curly dock	Limited	FACW	Grasslands, vernal pool, meadows, riparian. Widespread. Impacts appear to be minor.
Salsola tragus	Russian-thistle	Limited	UPL	Desert dunes and scrub, alkali playa. Widespread. Impacts minor in wildlands.
Senecio jacobaea	Tansey ragweed	Limited		
Sesbania punicea	Red sesbania, scarlet wisteria	High		Riparian areas.
Silybum marianum	Blessed milkthistle	Limited	UPL	Grasslands, riparian. Widespread, primarily in disturbed areas Impacts can be higher locally.
Sinapis arvensis	Wild mustard, charlock	Limited	UPL	Grasslands. Primarily in disturbed sites. Impacts minor or unknown in wildlands.
Spartium junceum	Spanish broom	High		Coastal scrub, grasslands, wetlands, oak woodland, forests
Taeniatherum caput-medusae	Medusahead	High	UPL	Grasslands, scrub, woodland.
Tamarix parviflora	Smallflower tamarisk	High		Riparian areas, desert washes, coastal scrub.

Table 8-1. Continued

Cal-IPC: The Inventory Database Scientific Name	Common Name	CAL-IPC Rating	Wetland Indicator Status	Habitats of Concern and Comments
Tamarix ramosissima	Saltcedar, tamarisk	High		Desert washes, riparian areas, seeps and springs.
Torilis arvensis	Hedgeparsley	Moderate	UPL	Expanding range. Appears to have only moderate ecological impacts.
Trifolium hirtum	Rose clover	Moderate	UPL	Grasslands, oak woodland. Widely planted in CA. Impacts relatively minor in most areas.
Verbascum thapsus	Common mullein, woolly mullein	Limited	UPL	Meadows, riparian, sagebrush, piñon-juniper woodlands. Widespread. Impacts minor.
Vinca major	Big periwinkle	Moderate	UPL	Riparian, oak woodlands, coastal scrub. Distribution currently limited but spreading in riparian areas. Impacts can be higher locally.
Vulpia myuros	Rattail fescue	Moderate	UPL	Coastal sage scrub, chaparral. Widespread. Rarely forms monotypic stands, but locally problematic.

OBL = Obligate.
FACW = Facultative Wetland.
FAC = Facultative.
UPL = Upland.
NI = No Indicator Status.

Weeds will be removed inside plant protection screens (for woody plantings), within the planting basins, and around stands of herbaceous plug plants. Weeds occurring at these locations will be removed manually as needed to reduce weed competition throughout the maintenance period, or until such time that the Land Manager determines that planted and seeded species have become sufficiently established and that no further maintenance is required to ensure that the plantings meet the performance standards (Chapter 9).

Native herbaceous vegetation that is planted, seeded, or that naturally colonizes the mitigation/restoration site will be retained, although this herbaceous vegetation will be cleared from the woody plant species planting basins during the maintenance period to ensure establishment of the planted material.

8.3.2.2 NONNATIVE PLANT CONTROL

Nonnative plants will be controlled in the onsite mitigation area and offsite mitigation units. The nonnative species to be controlled will vary depending on site-specific mitigation actions and associated performance standards. Invasive plants in or adjacent to mitigation locations will be controlled using manual, mechanical, or chemical control methods.

Reestablished and established wetlands have performance standards for relative percent cover by native wetland species. All nonnative species, regardless of whether they are defined as invasive, in these mitigation units may need to be controlled to ensure that the Year 10 performance standards for relative percent cover by native wetland cover are achieved.

The performance standards for invasive species cover for each mitigation type are described in Chapter 9. Invasive species will be controlled as needed to ensure that the performance standards are met.

Nonchemical weed control methods (manual and mechanical) are preferred over chemical methods. If nonchemical methods are used, weeds will be removed before they reach their flowering stage or spread (whichever occurs first). Weeds that are cut and cleared will be disposed of legally offsite at a landfill or other facility that accepts green waste. Manual control methods may include hand removal or use of small hand-powered or handheld equipment (e.g., Weed Wrench, chainsaw). Mechanical removal may include string-trimming and mowing.

If chemical methods are used, herbicides will be applied in late winter/early spring, when leaf rosettes are beginning to appear. This is an effective time to conduct chemical control because the frequency of application is reduced, so less herbicide is needed. Before herbicides are

applied, weeds will be string-trimmed to a height of 6–12 inches to further reduce the amount of herbicide needed. Cut materials will be disposed of legally offsite at a landfill or other facility that accepts green waste. Once the cut materials have been cleared, herbicide will be applied to the remaining leaves and stems. Repeated treatments may be necessary, as determined by a qualified biologist/botanist. All herbicide treatments will be conducted by licensed personnel in accordance with the manufacturer's specifications. Herbicide application will comply with federal, State, and local health and water quality regulations.

Invasive plants will be controlled in a manner that minimizes disturbance to desirable native animal and plant species to the extent feasible. Any mitigation plantings or existing woody plants damaged during invasive plant control activities will be replaced in-kind at a 1:1 ratio, consistent with planting procedures described for initial mitigation plantings. Replacement plants will be propagated from locally native stock if possible and will be as close as possible to the size of the damaged plant. Replacement plants will be planted in fall after rainfall has saturated the soil to a depth of approximately 10 inches. Replacement plant locations will be documented on the as-maintained drawings.

8.3.3 Assess Plant Protection and Health

During maintenance inspections, each woody plant will be checked for deer and rodent browse damage; insect damage; signs of disease; wind, water, or drought stress; and other damage. Plants substantially affected (i.e., beyond their ability to recover unaided) will be replaced following the same procedures specified for initial plantings. Locations will be marked, and replanting will occur in the fall after rainfall has saturated the soil to a depth of approximately 10 inches, as appropriate (Section 8.3.4). During the plant establishment period (from installation to the end of Year 3), all failed plantings usually are replaced, depending on how closely the performance standards are being met. During the short-term maintenance period, plant replacement can be more selective because planting densities will take into account some mortality.

Browse protection will be assessed to ensure that it is in good condition, functioning effectively, and not constricting or becoming embedded in the plant. If plants outgrow their browse protection, the protection will be replaced with larger collars or other measures or will be removed entirely.

Plants that become dislodged, settle excessively, or are otherwise unseated from their natural growing condition will be adjusted. Associated planting items such as plant protection, water basins, and mulch will be adjusted as necessary.

8.3.4 Replace Plants

8.3.4.1 REPLACE WOODY PLANTS

Woody plants will be inspected during annual vegetation monitoring surveys to determine whether replacement plants will be necessary to meet the performance standards. The annual monitoring report (Chapter 10) will identify the causes of any plant mortality and any remedial measures that may be necessary. For example, if a particular species has a high mortality rate, a determination will be made about the cause of plant mortality and whether replacement by another species better suited to the microsite conditions is warranted.

During each annual maintenance period, necessary replacement plants will be provided, installed, and maintained by the Mitigation Contractor or the Land Manager, depending on the maintenance period in which the work is to be performed. Replacement will involve planting enough seedlings that the number of living plants meets or exceeds the performance standards. Plants will be replaced following the same procedures specified for initial plantings. Replacement plants will be propagated from locally native stock if possible and will be as close as possible to the size of the original plant. Replacement plants will be planted in the fall after rainfall has saturated the soil to a depth of approximately 10 inches. Replacement plant locations will be documented on the as-maintained drawings.

8.3.4.2 REPLACE HERBACEOUS WETLAND PLANTS

Herbaceous plants will be densely planted; therefore, not each individual plant will be inspected during annual vegetation monitoring surveys. Instead, a general assessment of plant survival and vigor will be performed to determine whether replacement plants will be necessary to meet the performance standards. The assessment will focus on identifying relatively large areas that have experienced high plant mortality. The annual monitoring report (Chapter 10) will identify the causes of any plant mortality and any remedial measures that may be necessary. Based on the site assessments, a determination will be made about the cause of plant mortality and whether replacement by another species better suited to the microsite conditions is warranted.

During each annual maintenance period, necessary replacement plants will be provided, installed, and maintained by the Mitigation Contractor or the Land Manager, depending on the maintenance period in which the work is to be performed. Replacement will involve planting enough seedlings that the number of living plants meets or exceeds the performance standards. Plants will be replaced following the same procedures specified for initial plantings. Replacement plants will be propagated from locally native stock if possible and will be as close as possible to the size of the original plant. Replacement plants will be planted in the fall after

rainfall has saturated the soil to a depth of approximately 10 inches. Replacement plant locations will be documented on the as-maintained drawings.

8.3.5 Conduct Supplemental Seeding

Seeded areas include the wetland mitigation planting areas, as well as areas disturbed during implementation of mitigation actions. During maintenance inspections, a general assessment of seeded area establishment will be performed to determine whether supplemental seeding will be necessary. The assessment will focus on identifying relatively large areas that have experienced low seed germination and seedling establishment. The annual monitoring report (Chapter 10) will identify the causes of any plant mortality and any remedial measures that may be necessary. Based on the site assessments, a determination will be made about the cause of plant mortality and whether replacement by another species better suited to the microsite conditions is warranted.

These seeded areas will be maintained during the plant establishment period by the mitigation contractor and in the short-term maintenance period by the Land Manager. It is anticipated that the seeded areas will become vegetated by the seeded species and colonized by other herbaceous species that occur in adjacent areas. Seeding area maintenance will include reseeding large bare areas or other areas of concern identified by the mitigation contractor or Land Manager. Bare areas will be reseeded with the original seed mix at the rate specified in the construction documents.

8.3.6 Conduct General Assessment

The onsite mitigation area and offsite mitigation parcels will be assessed to ensure that site features such as fences, gates and irrigation systems are in good working condition and free of debris and trash. Access within the offsite mitigation parcels will be by two tracks. A two track is defined as an area where vehicles have been driven sufficiently enough to form two compacted tire tracks but the ground has never been graded.

General assessments also include ensuring that grazing lessees are in compliance with the grazing lease. For example, the Land Manager will perform routine inspections to ensure the correct stocking rates are maintained, rotation schedules and grazing seasons are adhered to, and cattle are not intruding into exclusionary areas. This work will involve working directly and closely with the lessee(s) to prevent problems or correct them if they arise.

Fences and gates will be maintained in good working condition. Damaged fencing material will be replaced or repaired. Gates will be maintained in an operable condition, including working locks. All excess fence wire, posts, fabric, and other materials will be collected and removed after each repair is completed. Maintenance of the fences will be the responsibility of the Land Manager. The Land Manager may delegate fence and gate maintenance to the active lessees however the ultimate responsibility lies with the Land Manager.

The onsite mitigation area and offsite mitigation parcels will be kept free of all unnatural debris and trash. Debris and trash will be removed promptly. Depending on the materials involved, debris and trash may be raked or removed manually, with care taken not to disturb or damage native vegetation. Collected debris and trash will be disposed of legally offsite at a landfill or other waste facility.

8.4 Recordkeeping

The maintenance activities described above will be documented on the as-maintained drawings during the plant establishment and short-term maintenance periods. The as-maintained drawings will be based on the as-built drawings. The as-maintained drawings will be updated as necessary to reflect current conditions at mitigation sites/parcels, including annual watering schedule and water application rates, invasive plant control activities, plant replacement, and general maintenance activities.

A record of monthly maintenance performed at the mitigation parcels will be kept during the plant establishment and short-term maintenance periods (i.e., 5 or 10 years). The record will document maintenance activities performed (e.g., purpose, location, method employed, labor and direct costs, effectiveness). A maintenance summary report will be compiled at the conclusion of each monitoring year that summarizes the monthly maintenance information and includes the as-maintained drawings for that maintenance year. This information will be helpful in the preparation of the performance-monitoring report (Chapter 10) and will be useful for long-term management and adaptive management decisions.

8.5 Maintenance Inspections

Schedules of maintenance inspections for the plant establishment period and the short-term maintenance period are presented in Tables 8-2 and 8-3.

Table 8-2. Schedule for Plant Establishment Maintenance Period

Activity	Schedule and Notes
Water woody mitigation plantings	Weekly inspection April 15 through October 31 for Year 1. Inspection twice monthly April 15 through October 31 for Years 2 and 3.
Control invasive plants	Two monthly inspections October through June. Monthly inspections July through September. Small infestations of invasive species removed immediately.
Control other nonnative plants	Two monthly inspections October through June. Monthly inspections July through September. Control of nonnative species in competition with mitigation plantings and native species cover.
Assess plant protection and health	Monthly inspection. Replacement planting in fall and winter.
Install replacement plants and supplemental seeding	Annual plant replacement (if needed) based on monitoring results; supplemental seeding as needed.
Conduct general assessment of offsite mitigation parcels	Monthly inspection; repairs as needed.

Table 8-3. Schedule for Short-Term Maintenance Period

Activity	Schedule
Control invasive plants	Quarterly inspection; small infestations removed immediately; herbicide use typically timed for late winter (appearance of leaf rosettes).
Assess plant protection and health	Quarterly inspection; replacement planting in the fall/winter.
Conduct general assessment of offsite mitigation parcels	Quarterly inspection; repairs as needed.

Chapter 9 Performance Standards

Performance standards have been developed to determine whether the project's compensatory mitigation has successfully mitigated project impacts. Performance standards are observable or measurable physical (including hydrologic), chemical, and/or biological attributes that are used to determine whether a compensatory mitigation project meets its objectives.

Compensatory mitigation for permanent impacts of the bypass project will include reestablishment, establishment, rehabilitation, and preservation. For preserved habitat, no performance standards are proposed; rather, only maintenance activities (e.g., maintaining fences and gates) and legal protections (e.g., conservation easements) are proposed.

Performance-standard monitoring will be performed to ensure that the compensatory mitigation is successful and fulfills the project's mitigation requirements. The tables in this chapter summarize performance standards for reestablished, established, and rehabilitated habitats, as well as monitoring schedules. Because of the experimental nature of the NCSG establishment, no quantitative performance standards have been assigned. Instead, performance objectives have been set, and the transplant effort will be monitored and compared to the objectives for educational purposes. Similarly, no remedial actions are required if the performance objectives are not met.

For the purpose of this document, a mitigation unit is defined as a geographic area in which a particular mitigation action will occur. Mitigation units occur in the onsite and offsite mitigation areas. For example, on Ford 108-020-04, areas of wetland establishment (one) and Type 3 (one) and Type 4 (one) wetland rehabilitation are proposed. Each of these areas will be assessed as an individual unit (mitigation unit). A single mitigation unit can span multiple parcel boundaries. For onsite reestablishment areas, each individual geographic polygon will be assessed separately. The monitoring results will be recorded and assessed separately for each onsite reestablishment unit. The monitoring results for each offsite mitigation unit will be assessed separately. Results will be presented in the annual monitoring report.

The reestablished, established, and rehabilitated mitigation areas will be considered successful if all the performance standards are met or exceeded for the onsite and offsite mitigation units. Written notification of completion of the performance monitoring period and compliance with the performance standards for all mitigation will be provided to resource agencies by Caltrans. The resource agencies then will confirm whether they are in agreement with the assessment.

The tables in the following sections summarize performance standards and monitoring years for reestablished, established, and rehabilitated habitats. In addition, performance standards for surface water quality are presented in the tables for rehabilitation habitats as either primary or secondary metrics and in the MRP.

Success of the reestablished, established, and rehabilitated mitigation habitats will be considered achieved if the performance standards in the tables are met or exceeded for each onsite mitigation unit and each offsite mitigation unit and the resource agencies confirm, in writing, that they are in agreement with the Land Manager's assessment.

If remedial actions are deemed necessary based on the results of performance monitoring, the Land Manager will coordinate with the appropriate regulatory agency to determine whether the performance monitoring period should be extended (e.g., an additional 3 years following the end of any remedial actions).

The corresponding performance monitoring methods for performance standards discussed below are presented in Chapter 10.

9.1 Primary and Secondary Monitoring Metrics

Caltrans, in coordination with the resource agencies, has identified primary and in some cases secondary monitoring metrics for each of the reestablishment, establishment, and rehabilitation actions (Tables 9-1 through 9-7).

Primary monitoring metrics are those performance standards that will be used to evaluate the success of the mitigation actions relative to the performance standards. The primary metrics directly measure the success of the mitigation actions relative to the type of habitat being manipulated. For example, in the wetland establishment areas, monitoring vegetative cover provided by wetland species or cover of native wetland species relates directly to the mitigation goal of establishing successful wetlands.

Secondary monitoring metrics are those performance standards that will be used as a secondary line of evidence to evaluate the functional success of the wetlands. For example, if one or more of the primary performance standards for the wetland establishment areas are not achieved, secondary metrics will be used to determine whether the wetlands provide an important functional value even though the wetland vegetation performance standards are not met. Secondary metrics have been applied to only certain rehabilitation habitats.

Table 9-1. Performance Standards and Mitigation Monitoring Requirements for Reestablished Wetlands in Bypass Construction Areas

Location	Objective	Mitigation Actions	Monitoring Metrics		Monitoring Year	Performance Standards	Monitoring Design
Group A and B Reestablished Wet Meadow Wetlands	Return temporary impact areas to preconstruction conditions or better	Grade to original topography Plant and seed native wetland species Control invasive plants	Primary Metric	Wetland species cover	1–5	Wetland species provide the majority of the vegetative cover	Wetland species cover will be estimated at representative sampling points at each sampling location. Wetland species cover will be visually estimated at each sampling location. Wetland species cover composition is not restricted to the list of target species.
				Species richness	1–5	Presence of at least 15 species with a wetland indicator status of facultative or wetter	Species richness will be visually estimated at each sampling location.
				Invasive species cover	1–5	Invasive species not dominant	Invasive species cover will be estimated at the same sampling points used for estimating wetland species cover. Invasive species cover will be visually estimated at each sampling location.
				Wetland hydrology	1–5	Wetland hydrology present (ponding or soil saturation)	Wetland hydrology will be monitored at the Group A and Group B reestablishment sites only if an individual site does not meet the parameter for wetland plant species according to the USACE wetland delineation protocol. If the wetland plant species parameter is not met, an assessment of soils and hydrology will be performed, beginning with the wetland delineation protocol, to determine the reason for the absence of or low wetland species cover.

Table 9-1. Continued

Location	Objective	Mitigation Actions	Monitoring Metrics		Monitoring Year	Performance Standards	Monitoring Design
Group C Reestablished Wet Meadow Wetlands	Return temporary impact areas to preconstruction conditions or better	Grade to original topography Plant and seed native wetland species Control invasive plants	Primary Metric	Relative cover by wetland plant species	1	50%	Relative cover will be monitored using randomly selected 1–square meter quadrats placed along permanent 100-meter-long transects. If wetland dimensions do not accommodate a 100-meter transect, the transect length will be shortened to the dimensions of the wetland. A maximum of five transects will be field-located for each acre of reestablished or established wetland.
					2	60%	
					3	70%	
					4	75%	
					5	80%	
				Relative cover by selected native wetland plant species	1	50%	Relative cover by native wetland plant species from the list of target species will be estimated using the same method as that used for estimating relative cover by wetland plant species.
					2	55%	
					3	60%	
					4	65%	

Table 9-1. Continued

Location	Objective	Mitigation Actions	Monitoring Metrics		Monitoring Year	Performance Standards	Monitoring Design
Group C Reestablished Wet Meadow Wetlands (cont.)			Primary Metric	Relative cover by selected native wetland plant species (cont.)	5	70%	
				Species richness	1	A minimum of 15 species from the list of target species will be seeded or planted	The contract specifications will require the contractor to seed/plant a minimum of 15 species from the list of target species. This will be enforced during construction of the wetland sites. Although the performance standard is a one-time action, species richness will be monitored for informational purposes using the same transect and quadrats used for determining relative cover as well as by performing a relevé survey in each reestablished wetland.
				Hydroperiod	1–5	The hydroperiod will be the same cover class as characterized by the USACE assessment of preproject wetland hydrology	Hydroperiod monitoring will include determining the extent of ponding and soil saturation once cumulative rainfall has reached approximately 5 inches (typically November). Inundation depths will be measured at one fixed point for each reestablished wetland using a staff gage and/or shallow groundwater monitoring wells.
				Absolute cover by invasive plants	1–5	Absolute cover by invasive species will not increase over baseline.	The absolute cover by invasive plants will be measured in the sampling quadrats as well as by performing relevé surveys throughout each sampling unit.

Table 9-1. Continued

Location	Objective	Mitigation Actions	Monitoring Metrics		Monitoring Year	Performance Standards	Monitoring Design
Riparian Wetland Reestablishment Areas	Return temporary impact areas to preconstruction conditions or better	Grade to original topography Plant and seed native riparian species Control invasive plants	Primary Metric	Plant survival	1	90%	Each plant that was planted as part of mitigation efforts will be monitored for survival (replacement plants are included in this monitoring). The determination of survival rates will be based on the total number of plants of that species originally planted at each mitigation site. Plants will be recorded as dead if no viable aboveground growth is visible.
					2	80%	
					3	70%	
					4	60%	
					5	60%	
				Plant vigor	1–4	Greater than 1.0	Each plant that was planted as part of mitigation efforts will be monitored to assess vigor (replacement plants are included in this monitoring). A vigor rating of *good, fair,* or *poor* (values of 3.0, 2.0, and 1.0, respectively) will be assigned to each plant. Vigor scores will be averaged for each species.
					5	Equal to or greater than 2.0	

Table 9-1. Continued

Location	Objective	Mitigation Actions	Monitoring Metrics		Monitoring Year	Performance Standards	Monitoring Design
Riparian Wetland Reestablishment Areas (cont.)			Primary Metric	Relative cover (i.e., relative canopy cover) by native tree species	5	10%	The line-intercept method will be used to record the relative vegetation cover by native tree species.
					6	20%	
					8	40%	
					10	50%	
				Relative cover (i.e., relative canopy cover) by native shrub species	5	10%	The line-intercept method will be used to record the relative vegetation cover by native tree species.
					6	20%	
					8	40%	
					10	50%	
				Hydroperiod	1–10	The hydroperiod will be the same as characterized by the USACE assessment of preproject wetland hydrology	Hydroperiod monitoring will include determining the extent of ponding and soil saturation once cumulative rainfall has reached approximately 5 inches (typically November). Inundation depths will be measured at one fixed point for each reestablished wetland using a staff gage and/or shallow groundwater monitoring wells.

Table 9-1. Continued

Location	Objective	Mitigation Actions	Monitoring Metrics		Monitoring Year	Performance Standards	Monitoring Design
Riparian Reestablishment (Non-wetlands, Other waters	Return temporary impact areas to preconstruction conditions or better	Grade to original topography Plant and seed native riparian species Control invasive plants	Primary Metric	Plant survival	1	90%	Monitoring design same as for reestablished riparian wetland.
					2	80%	
					3	70%	
					4	60%	
					5	60%	
				Plant vigor	1–4	>1.0	Monitoring design same as for reestablished riparian wetland.
					5	≥2.0	
				Relative cover (relative canopy cover) by native tree species	5	10%	Monitoring design same as for reestablished riparian wetland.
					6	20%	
					8	40%	
					10	50%	
				Relative cover (relative canopy cover) by native shrub species	5	10%	Monitoring design same as for reestablished riparian wetland.
					6	20%	
					8	40%	
					10	50%	

Table 9-2. Performance Standards and Mitigation Monitoring Requirements for North Coast Semaphore Grass Establishment Areas

Mitigation Mgmt Unit	Type of Mitigation	Objective	Monitoring Metrics	Monitoring Years	Performance Objectives	Monitoring Design
North Coast Semaphore Grass Establishment Areas	Transplant individuals from impact area	Salvage plants directly affected; augment populations with plants grown from seed	Plant survival and vigor	Years 0–10	Document initial survival and growth of transplants at year 0 in a pilot study. Based on initial results, target potentially suitable habitat areas for the remaining transplants; document results in annual monitoring reports and a final report after Year 10. The mitigation objective is to achieve 60% survival of transplanted individuals at the end of 10 years. However, because this is an experimental action, quantitative performance standards have not been assigned and no remedial actions are required.	Track the survival and growth of a subset of transplants and container stock within fixed plots in transplant areas. Visual assessment and permanent photo points.
	Propagate container plants from seed	Salvage plants directly affected; augment populations with plants grown from seed	Plant survival and vigor	Years 0–10	Based on results of the pilot study, target potentially suitable habitat areas for augmentation using container plants grown from seed. Conduct one replacement planting for plants that have died at the end of Year 5; Document results in annual monitoring reports and a final report after Year 10. The mitigation objective is to achieve 60% survival of transplanted individuals at the end of 10 years. However, because this is an experimental action, quantitative performance standards have not been assigned and no remedial actions are required.	Track the survival and growth of a subset of transplants and container stock within fixed plots in transplant areas. Visual assessment and permanent photo points.
	Control invasive plants	Control invasive plants to prevent competition with North Coast semaphore grass plantings	Invasive Species	Years 0–10	Absolute cover by invasive species will not increase over baseline in the North Coast semaphore grass establishment areas.	Estimate absolute cover within fixed quadrats along permanent transects.

Table 9-3. Performance Standards and Mitigation Monitoring Requirements for North Coast Semaphore Grass Rehabilitation Areas

Mitigation Mgmt Unit	Enhancement and Preservation Actions	Objective	Monitoring Metrics		Monitoring Year	Performance Standards	Monitoring Design
North Coast Semaphore Grass Rehabilitation Areas	Managed grazing regime	Maintain or improve habitat for North Coast semaphore grass Control invasive plants to prevent competition with North Coast semaphore grass	Primary Metrics	Population distribution and abundance	Years 0–10	Stable or increasing trend in population distribution (area occupied) and abundance (absolute cover).	Permanent transects with fixed quadrats within representative stands.
				Absolute cover by woody vegetation in the understory (e.g., shrubs, vines)	Years 0–10	No increase in absolute cover of woody understory vegetation above baseline conditions.	Estimate absolute cover within fixed quadrats along permanent transects.
				Invasive species	Years 0–10	Absolute cover by invasive species will not increase over baseline in the North Coast semaphore grass enhancement areas.	Estimate absolute cover within fixed quadrats along permanent transects.

Table 9-4. Performance Standards and Mitigation Monitoring Requirements for Baker's Meadowfoam Plant Management Areas

Mitigation Mgmt Unit	Enhancement and Preservation Actions	Objective	Monitoring Metrics		Location	Monitoring Year	Performance Standards	Monitoring Design
Grazed Parcels	Managed grazing regime	Maintain or improve habitat for Baker's meadowfoam Control invasive plants to prevent competition with Baker's meadowfoam	Primary Metrics	Population distribution and abundance	Baker's meadowfoam management areas on grazed parcels	Years 0–10	Stable or increasing trend in population distribution (area occupied) and abundance (absolute cover) after controlling for climatic variability. Climatic variability (precipitation, temperature) from the previous rain season will be used to identify trends in Baker's meadowfoam populations from year to year.	Map occupied habitat within CRAM AAs using GPS. Within the CRAM AAs, estimate absolute cover in random quadrats within representative polygons. Level 3 data collection within CRAM AAs.
				Absolute cover by other native plant species	Baker's meadowfoam management areas on grazed parcels	Years 0–10	Stable or increasing trend in absolute percent cover of native plant associates.	Within the CRAM AAs, estimate absolute cover in random quadrats within representative polygons. Level 3 data collection within CRAM AAs.
				Invasive species	Baker's meadowfoam management areas on grazed parcels	Years 0–10	Absolute cover by invasive species will not increase over baseline within the Baker's meadowfoam populations.	Visually estimate invasive species cover within CRAM AAs. Within the CRAM AAs, estimate absolute cover in random quadrats within representative polygons. Level 3 data collection within CRAM AAs.

Table 9-5. Performance Standards and Mitigation Monitoring Requirements for Wetland Establishment Areas

Mitigation Actions	Objective	Monitoring Metrics		Monitoring Year	Location	Performance Standards	Monitoring Design
Grade to create wetland topography Native planting and seeding	Establish wet meadows Control invasive species	Primary Metrics	Relative cover by wetland plant species	1	Group 1 Wetlands	50%	Relative cover provided by planted, seeded, and naturally recruited wetland plant species for each established wetland will be monitored using randomly selected 1–square meter quadrats placed along permanent 100-meter-long transects.
				2		60%	
				3		70%	
				4		75%	
				5		80%	
			Relative cover by selected native wetland plant species	1	Group 1 Wetlands	50%	Relative cover by native wetland plant species from the list of target species will be estimated using the same method as that used for estimating relative cover by wetland plant species.
				2		55%	
				3		60%	
				4		65%	
				5		70%	

Table 9-5. Continued

Mitigation Actions	Objective	Monitoring Metrics		Monitoring Year	Location	Performance Standards	Monitoring Design
		Primary Metrics	Species Richness	1	Group 1 Wetlands	A minimum of 15 species from the list of target species will be seeded or planted.	The contract specifications will require the contractor to seed/plant a minimum of 15 species from the list of target species. This will be enforced during construction of the wetland sites. Although the performance standard is a one-time action, species richness will be monitored for informational purposes using the same transect and quadrats used for determining relative cover as well as by performing a relevé survey in each established wetland.
			Hydroperiod	1–5	Group 1 Wetlands	The hydroperiod for established wetland habitats will be within ±10% of the hydroperiod for monitoring reference sites.	Hydroperiod monitoring will include determining the extent of ponding and soil saturation in established wetlands.
			Absolute cover by invasive plants	1–5	Group 1 Wetlands	Absolute cover by invasive species will be no more than 5% in the established wetlands.	The absolute cover by invasive plants will be measured in the sampling quadrats as well as by performing relevé surveys throughout each sampling unit.
			Relative cover by wetland plant species	1	Group 2 Wetlands	50%	Relative cover provided by planted, seeded, and naturally recruited wetland plant species for each established wetland will be monitored using randomly selected 1–square meter quadrats placed along permanent 100-meter-long transects.

Table 9-5. Continued

Mitigation Actions	Objective	Monitoring Metrics		Monitoring Year	Location	Performance Standards	Monitoring Design
		Primary Metrics	Relative cover by wetland plant species (cont.)	2	Group 2 Wetlands	50%	
				3		60%	
				4		60%	
				5		70%	
				6		70%	
				7		75%	
				8		75%	
				9		75%	
				10		80%	
			Relative cover by selected native wetland plant species	1	Group 2 Wetlands	50%	Relative cover by native wetland plant species from the list of target species will be estimated using the same method as that used for estimating relative cover by wetland plant species.
				2		50%	

Table 9-5. Continued

Mitigation Actions	Objective	Monitoring Metrics		Monitoring Year	Location	Performance Standards	Monitoring Design
		Primary Metrics	Relative cover by selected native wetland plant species (cont.)	3	Group 2 Wetlands	55%	
				4		55%	
				5		60%	
				6		60%	
				7		65%	
				8		65%	
				9		65%	
				10		70%	

Table 9-5. Continued

Mitigation Actions	Objective	Monitoring Metrics		Monitoring Year	Location	Performance Standards	Monitoring Design
		Primary Metrics	Species richness	1	Group 2 Wetlands	A minimum of 15 species from the list of target species will be seeded or planted.	The contract specifications will require the contractor to seed/plant a minimum of 15 species from the list of target species. This will be enforced during construction of the wetland sites. Although the performance standard is a one-time action, species richness will be monitored for informational purposes using the same transect and quadrats used for determining relative cover as well as by performing a relevé survey in each established wetland.
			Hydroperiod	1–10	Group 2 Wetlands	The hydroperiod for established wetland habitats will be within ±10% of the hydroperiod for monitoring reference sites	Hydroperiod monitoring will include determining the extent of ponding and soil saturation in established wetlands.
			Absolute cover by invasive plants	1–10	Group 2 Wetlands	Absolute cover by invasive species will be no more than 5% in the established wetlands.	The absolute cover by invasive plants will be measured in the sampling quadrats as well as by performing relevé surveys throughout each sampling unit.

Table 9-6. Performance Standards and Mitigation Monitoring Requirements for Wet Meadow Rehabilitation Areas

Rehabilitation Actions	Objective	Monitoring Metrics			Monitoring Year	Location	Performance Standards	Monitoring Design
Wetland rehabilitation Native planting and seeding Grazing restriction in select locations Implement grazing management regime in select locations	Control invasive species Improve wetland condition and maintain wetland ecological diversity Water quality improvement in receiving waters	Primary Metrics	CRAM Biotic Attribute Values (Wet Meadow Module)	• Plant Mosaic Complexity • Co-Dominant Plant Species • Percent Invasion	3	CRAM AAs with a baseline score of 3 or 6	10% of AAs with scores of 3 or 6 improve to a 9 or better for each CRAM attribute.	CRAM AA placement per baseline design. CRAM AA locations will be fixed for the duration of the monitoring period.
					5		25% of AAs with scores of 3 or 6 improve to a 9 or better for each CRAM attribute.	
					7		50% of AAs with scores of 3 or 6 improve to a 9 or better for each CRAM attribute.	
					10		75% of AAs with scores of 3 or 6 improve to a 9 or better for each CRAM attribute.	
					3, 5, 7, 10	All remaining CRAM AAs that do not show a categorical improvement.	No degradation below baseline CRAM attribute scores.	

Table 9-6. Continued

Rehabilitation Actions	Objective	Monitoring Metrics			Monitoring Year	Location	Performance Standards	Monitoring Design
			Invasive Plant Cover	Absolute Percent Cover by Invasive Species	2, 4, 5, 7, 9, 10	Wetland rehabilitation areas	Absolute cover by invasive species will not increase over baseline in the reestablished wetlands.	Permanent line transects located on each mitigation parcel. Transect locations will be the same as those developed for the USACE MMP.
		Secondary Metrics	Beneficial Uses/Water Quality Objectives	• Biostimulatory Substances • Bacteria • Toxicity • Sediment, Turbidity, Settleable Materials	*Refer to MRP*	*Refer to MRP*	*Refer to MRP*	*Refer to MRP*
			Baker's Meadowfoam Habitat	• Maintain or Improve Habitat for Baker's Meadowfoam • Control Invasive Plants to Prevent Competition with Baker's Meadowfoam	1–10	Grazing management areas only	*Note: The specific performance standards are presented in Table 9-5.*	*Note: The monitoring design is presented in Table 9-5.*

Table 9-7. Performance Standards and Mitigation Monitoring Requirements for Riparian Establishment and Other Waters

Mitigation Actions	Objective	Monitoring Metrics		Location	Monitoring Year	Performance Standards	Monitoring Design
Riparian Establishment Areas							
Grazing restriction Implement bank erosion measures Native planting and seeding Control invasive species	Improve riparian habitat condition and diversity Improve stream stability Water quality improvement in receiving waters	Primary Metrics	Plant Survival	All riparian planting areas	1	90%	Each plant that was planted as part of mitigation efforts will be monitored for survival (replacement plants are included in this monitoring). The determination of survival rates will be based on the total number of plants of that species originally planted at each mitigation site. Plants will be recorded as dead if no viable aboveground growth is visible.
					2	80%	
					3	70%	
					4	60%	
					5	60%	

Table 9-7. Continued

Mitigation Actions	Objective	Monitoring Metrics		Location	Monitoring Year	Performance Standards	Monitoring Design
		Primary Metric	Plant Vigor	All riparian planting areas	1–4	Average vigor score, by species, greater than 1.0.	Each plant that was planted as part of mitigation efforts will be monitored to assess vigor (replacement plants are included in this monitoring). A vigor rating of *good, fair* or *poor* (values of 3.0, 2.0, and 1.0, respectively) will be assigned to each plant.
				All riparian planting areas	5	Average vigor score, by species, equal to or greater than 2.0.	
			Percent Vegetation Cover (i.e., Absolute Canopy Cover) by Native Tree Species	All riparian planting areas	5	10%	Assessed quantitatively using a line-intercept method that will determine riparian habitat canopy cover.
					6	20%	
					8	40%	
					10	50%	
			Plant Vegetation Cover (i.e., Absolute Canopy Cover) by Native Shrub Species	All riparian planting areas	5	10%	Assessed quantitatively using a line-intercept method that will determine riparian habitat canopy cover.
					6	20%	
					8	40%	
					10	50%	

Table 9-7. Continued

Mitigation Actions	Objective	Monitoring Metrics			Location	Monitoring Year	Performance Standards	Monitoring Design
		Primary Metric	CRAM Biotic Attribute Values (Riverine Module)	Vertical Biotic Structure Metric Horizontal Interspersion and Zonation Metric Invasive Species Metric	CRAM AAs with a baseline score of 3 or 6	3	10% of AAs with scores of 3 or 6 improve to a 9 or better for each CRAM attribute.	CRAM AA placement per baseline design. CRAM AA locations will be fixed for the duration of the monitoring period.
						5	25% of AAs with scores of 3 or 6 improve to a 9 or better for each CRAM attribute.	
						7	50% of AAs with scores of 3 or 6 improve to a 9 or better for each CRAM attribute.	
						10	75% of AAs with scores of 3 or 6 improve to a 9 or better for each CRAM attribute.	
					All remaining CRAM AAs that do not show a categorical improvement.	3, 5, 7, 10	No degradation below baseline for CRAM attribute.	

Table 9-7. Continued

Mitigation Actions	Objective	Monitoring Metrics			Location	Monitoring Year	Performance Standards	Monitoring Design
			CRAM Physical Attribute Values (Riverine Module)	Structure Patch Richness Metric Topographic Complexity Metric	CRAM AAs with a baseline score of 3 or 6.	3	10% of AAs with baseline scores of 3 or 6 improve to at least a 6 or 9, respectively.	CRAM AA placement per baseline design. CRAM AA locations will be fixed for the duration of the monitoring period.
						5	25% of AAs with baseline scores of 3 or 6 improve to at least a 6 or 9, respectively,	
						7	50% of AAs with baseline scores of 3 or 6 improve to at least a 6 or 9, respectively,	
						10	75% of AAs with baseline scores of 3 or 6 improve to at least a 6 or 9, respectively,	
					All remaining CRAM AAs that do not show a categorical improvement.	3, 5, 7, 10	No degradation below baseline for CRAM Attribute.	

Table 9-7. Continued

Mitigation Actions	Objective	Monitoring Metrics			Location	Monitoring Year	Performance Standards	Monitoring Design
		Secondary Metrics	Beneficial Uses/Water Quality Objectives	• Biostimulatory Substances • Bacteria • Toxicity • Turbidity • Settleable Materials • Sediment • Temperature • Sediment Priority/Bank Stability • Dissolved Oxygen and pH Bioassessment	*Refer to the MRP*	*Refer to the MRP*	*Refer to the MRP*	*Refer to the MRP*
			Temperature		Sampling locations at same location as baseline sampling locations	1–10	75% tree and shrub cover measured at year 10.	Sampling method per the baseline sampling protocols.
						1–10	Percent of effective shade for each subreach either remains at baseline or increases to 80% at year 10[1].	Sampling method per the baseline sampling protocols.
			Sediment		Five erosion sites selected for repair (priority sites identified in the 2010 erosion assessment study, Appendix N)	1–10	Increase in stability and condition.	Sampling method per the 2010 erosion assessment study (Appendix N) and CRAM (physical structure, hydrologic connectivity, and channel stability).
					All erosion sites identified in Appendix N	1–10	Sites remain stable compared to baseline and are not contributing to excessive sedimentation.	Sampling method per the 2010 erosion assessment study (Appendix N).

Table 9-7. Continued

Mitigation Actions	Objective	Monitoring Metrics			Location	Monitoring Year	Performance Standards	Monitoring Design
		Secondary Metrics	Beneficial Uses/Water Quality Objectives	• Biostimulatory Substances • Bacteria • Toxicity • Turbidity • Settleable Materials • Sediment • Temperature • Sediment Priority/Bank Stability • Dissolved Oxygen and pH Bioassessment	*Refer to the MRP*	*Refer to the MRP*	*Refer to the MRP*	*Refer to the MRP*

[1] This performance standard does not apply to Davis Creek. Refer to Section 9.2.8.1

9.2 Performance Standards for Determining Mitigation Success

9.2.1 Reestablished Wet Meadow Wetland

Wetland reestablishment will occur only onsite. Reestablished wetlands will be monitored annually for 5 years. The wet meadow wetland reestablishment sites will be separated into the following size categories.

- Group A wetland reestablishment is any area that is less than 3,000 feet^2 in total area.
- Group B wetland reestablishment is any site between 3,000 feet^2 and 1.00 acre in total area.
- Group C wetland reestablishment is any site that is more than 1.00 acre in total area.

Table 9-1 identifies the performance standards for wetland reestablishment. The monitoring results will report on the sites that do and do not meet the performance standards. Additional information related to monitoring methods is provided in Chapter 10.

The success of Group A and B reestablished wet meadow wetland habitat will be measured by performance standards for:

- Wetland species cover.
- Species richness.
- Invasive species cover.
- Wetland hydrology and soils (if relative species cover performance standards are not met).

The success of Group C reestablished wet meadow wetland habitat will be measured by performance standards for:

- Relative cover by wetland plant species.
- Relative cover by wetland species from the list of target species.
- Species richness.
- Hydroperiod.
- Absolute cover by invasive plants.

9.2.1.1 GROUPS A AND B WETLAND REESTABLISHMENT

WETLAND PLANT SPECIES COVER

For Groups A and B reestablishment sites, wetland plant species will provide the majority of the plant cover (Table 9-1). If wetland plant species are not providing the majority of plant cover, further investigations of hydrology and soils will be necessary to determine whether the areas are functioning as a wetland.

SPECIES RICHNESS

Site-specific planting lists are provided in Appendix D. These lists may need to be refined based on plant availability prior to planting. For wetland reestablishment Groups A and B, a minimum of 15 species that have a wetland indicator status of facultative (FAC) or wetter must be present in the final monitoring year.

WETLAND HYDROLOGY AND SOILS

For Groups A and B wetland reestablishment, the need to investigate the presence of wetland hydrology or wetland soils is triggered only if the relative wetland plant cover performance standard is not met. In this case, Groups A and B must have hydrology present (ponding or saturated) at the time of monitoring (Table 9-1).

INVASIVE SPECIES COVER

Invasive plant cover, as defined in Chapter 8, will be monitored concurrently with cover for wetland species in the wet meadow reestablishment sites. A list of invasive species known or with the potential to occur in the mitigation areas and which will be targeted for control is provided in Table 8-1. For Groups A and B reestablishment, the invasive species may not be dominant (Table 9-1).

9.2.1.2 GROUP C WETLAND REESTABLISHMENT

RELATIVE COVER BY WETLAND PLANT SPECIES

For Group C reestablished wetlands, at least 80% relative vegetation cover by wetland plant species will be present at the final monitoring year (Table 9-1). Annual performance standards have been developed to serve as indicators of the trend in the establishment of relative cover by wetland plant species. Wetland species are defined as FAC, facultative wetland (FACW), or obligate (OBL) after Reed (1988).

Relative Cover by Native Wetland Plant Species from List of Target Species

For Group C reestablished wetlands, native wetland vegetation from the list of target species will provide 70% relative cover at the final monitoring year (Table 9-1). Annual performance standards have been developed to serve as indicators of the trend in establishment of relative percent cover by native wetland plant species. Wetland species are defined as FAC, FACW, or OBL after Reed (1988).

Species Richness

A minimum of 15 species from the list of target species will be planted in Group C reestablished wetland habitat. The list of approved wetland plant species is presented in Table 7-5. Site-specific planting lists are provided in Appendix D. These lists may need to be refined based on plant availability prior to planting.

Hydroperiod

The hydroperiod for Group C reestablished wetlands will be the same cover class as the cover class recorded during preproject baseline studies (Table 9-1). Baseline studies showed Group C reestablished wetlands to have a very long duration subsurface saturated wetland hydrology.

Absolute Cover by Invasive Plants

Invasive plant cover, as defined in Chapter 8, will be monitored concurrently with absolute percent cover for wetland and native wetland species in the wet meadow reestablishment sites. A list of invasive species known or with the potential to occur in the mitigation areas and which will be targeted for control is provided in Table 8-1. For Group C wetland reestablishment, absolute cover by invasive plants will not be allowed to increase over baseline (Table 9-1).

9.2.2 Reestablished Riparian Wetland and Other Waters Habitat

Riparian wetland and other waters reestablishment will occur only onsite and will be monitored annually for 10 years. The performance standards (Table 9-1) for these habitats are the same with the exception of hydroperiod, which will apply only to riparian wetlands. The success of reestablished riparian wetland and other waters habitats will be measured by performance standards for:

- Plant survival.
- Plant vigor.

- Relative cover by native tree species.
- Relative cover by native shrub species.
- Hydroperiod (riparian wetland only).

9.2.2.1 PLANT SURVIVAL

All plants planted as part of mitigation efforts (including replacement plants) will be monitored to assess survival rates, with monitoring results reported separately for each onsite reestablishment area. Naturally recruited plants will not be included as part of plant survival monitoring because inclusion would skew the monitoring results, which focus on survival of planted material. Planted material will have a minimum of 60% survival at Year 5. The plant survival performance standard will be replaced in Year 5 by percent vegetation cover performance standards, which will be monitored in Years 5, 6, 8, and 10 and will include both planted and naturally recruited vegetation. This shift is appropriate because as riparian habitat develops and plants mature, a canopy begins to develop and individual plant assessment becomes less relevant to overall ecological success. In addition, the intent of riparian establishment efforts is to increase the cover on Categories I, II, and III Riparian Corridor streams; accordingly, a direct assessment of cover is desirable to determine whether mitigation efforts are successful.

9.2.2.2 PLANT VIGOR

All plants planted as part of mitigation efforts (including replacement plants) will be monitored during Years 1 through 5 to assess vigor, with monitoring results reported separately for each onsite reestablishment area. Naturally recruited plants will not be included as part of plant vigor monitoring because inclusion would skew the monitoring results, which focus on vigor of planted material.

The determination of vigor will include disease symptoms, low-density foliage, atypical leaf color, stem and foliar vigor (e.g., signs of desiccation, leaf curl), browsing or other wildlife-related damage, and vandalism. A vigor rating of *good, fair* or *poor* (values of 3.0, 2.0, and 1.0, respectively) will be assigned to each plant. Dead plants will not be assigned a vigor rating. These ratings are defined below.

- **Good (3.0):** a plant with less than 25% of its aboveground growth exhibiting one or more of the factors listed above.
- **Fair (2.0):** a plant with 25–75% of its aboveground growth exhibiting one or more of the factors listed above.

- **Poor (1.0):** a plant with more than 75% of its aboveground growth exhibiting one or more of the factors listed above.
- **Dead:** a plant that does not appear capable of growth.

For planted material to be considered alive, plant vigor must be greater than 1.0 for Years 1–4 and equal to or greater than 2.0 at Year 5.

9.2.2.3 PERCENT VEGETATION COVER

The percent vegetation cover (i.e., relative canopy cover) in the reestablished sites for planted and naturally recruited native tree and shrub species by vegetative strata must be 50% at Year 10 (Table 9-1). Monitoring results will be reported separately for each onsite reestablishment area.

9.2.2.4 HYDROPERIOD

The hydroperiod for reestablished riparian wetlands will be the same cover class as the cover class recorded during preproject baseline studies. Baseline studies showed Group C reestablished wetlands to have a very long–duration subsurface saturated wetland hydrology.This performance standard does not apply to other waters (non-wetland riparian) planting areas.

9.2.3 North Coast Semaphore Grass Establishment and Rehabilitation

NCSG establishment will occur on the Huffman parcel. NCSG rehabilitation will occur on the Arkelian, Goss, Lusher East, and MGC Plasma parcels. NCSG will be monitored annually for 10 years.

9.2.3.1 NORTH COAST SEMAPHORE GRASS ESTABLISHMENT AREA

There are no performance standards for the NCSG establishment area. Instead, less stringent objectives have been applied to the NCSG establishment area:

- Plant survival and vigor of transplants.
- Plant survival and vigor of container plants.
- Invasive species.

No secondary metrics were developed for the NCSG establishment area. Performance objectives are listed in Table 9-2.

PLANT SURVIVAL AND VIGOR OF TRANSPLANTS

A pilot study has been initiated to gather information on the most suitable transplant locations. The study involves transplanting NCSG prior to the mitigation avoidance effort. The survival and vigor of initial transplants will be documented for the Year 0 pilot study. The initial survey results will be used to target potentially suitable habitat areas for the remaining transplants. Plant survival and vigor of transplants will be documented in annual monitoring reports through Year 10.

The performance objective is to achieve 60% survival of transplanted individuals at the end of 10 years (Table 9-2). Although there are no required performance standards or remediation measures for container plant survival, Caltrans will conduct one replacement planting for plants that have died at the end of Year 5.

PLANT SURVIVAL AND VIGOR OF CONTAINER PLANTS

Plant survival and vigor of container plants will be documented in annual monitoring reports through Year 10.

The mitigation objective is to achieve 60% survival of container plant individuals at the end of 10 years (Table 9-2).

INVASIVE SPECIES

The performance standard for cover by invasive plants will be that absolute cover will not be allowed to increase over baseline (Table 9-2). A list of invasive species known or with the potential to occur in the mitigation areas and which will be targeted for control is provided in Table 8-1.

9.2.3.2 NORTH COAST SEMAPHORE GRASS REHABILITATION AREAS

The success of NCSG rehabilitation areas will be measured by performance standards for:

- Population distribution and abundance.
- Absolute cover by woody vegetation in the understory.
- Invasive species.

The performance standards for NCSG rehabilitation are listed in Table 9-3.

POPULATION DISTRIBUTION AND ABUNDANCE

The performance standard for population distribution and abundance is demonstration of a stable or increasing trend in population distribution (area occupied) and abundance (absolute cover) (Table 9-3).

ABSOLUTE COVER BY WOODY VEGETATION IN THE UNDERSTORY

The performance standard for absolute cover by woody species is demonstration of no increase in absolute cover by other woody understory species (e.g., shrubs, vines) (Table 9-3).

INVASIVE SPECIES

The performance standard for cover by invasive plants will be that absolute cover will not be allowed to increase over baseline (Table 9-3). A list of invasive species known or with the potential to occur in the mitigation areas and which will be targeted for control is provided in Table 8-1.

9.2.4 Baker's Meadowfoam Rehabilitation

BM rehabilitation will occur on grazed portions of the Benbow, Ford, Frost, Lusher, Nance, Niesen, Watson, and Wildlands parcels. BM rehabilitation areas will be monitored annually for 10 years. All monitoring for BM will occur in the CRAM AAs. The success of BM rehabilitation areas will be measured by performance standards for:

- Population distribution and abundance.
- Absolute cover by other native plant species.
- Invasive species (Table 9-4).

9.2.4.1 POPULATION DISTRIBUTION AND ABUNDANCE

The performance standard for population distribution and abundance is demonstration of a stable or increasing trend in population distribution (area occupied) and abundance (absolute cover) after controlling for climatic variability. Climatic variability (precipitation, temperature) from the previous rain season will be used to identify trends in BM populations from year to year.

9.2.4.2 ABSOLUTE COVER BY OTHER NATIVE PLANT SPECIES

The performance standard for absolute cover by other native plant species is demonstration of a stable or increasing trend in absolute cover by other native plant species (Table 9-4).

9.2.4.3 INVASIVE SPECIES

The performance standard for cover by invasive plants will be that the absolute cover will not increase over baseline (Table 9-4). A list of invasive species known or with the potential to occur in the mitigation areas and which will be targeted for control is provided in Table 8-1.

9.2.5 Established Wetland

Group 1 and Group 2 wetland establishment will occur only on the offsite mitigation properties. Group 1 and Group 2 establishment have the same performance standards, but the Group 1 wetlands will be monitored for 5 years and the Group 2 wetlands will be monitored for 10 years. The success of established wetlands will be measured by performance standards for:

- Relative cover by wetland species.
- Relative cover by wetland species from the list of target species.
- Species richness.
- Hydroperiod.
- Absolute cover by invasive plants (Table 9-5).

9.2.5.1 RELATIVE COVER BY WETLAND PLANT SPECIES

For established wetlands, at least 80% relative vegetation cover by wetland plant species will be present at the final monitoring year (Table 9-5). Annual performance standards have been developed to serve as indicators of the trend in the establishment of relative cover by wetland plant species. Wetland species are defined as FAC, FACW, or OBL after Reed (1988).

9.2.5.2 RELATIVE COVER BY SELECTED NATIVE WETLAND PLANT SPECIES

For established wetlands, native wetland vegetation from the list of target species will provide 70% relative cover at the final monitoring year (Table 9-5). Annual performance standards have been developed to serve as indicators of the trend in establishment of relative percent cover by native wetland plant species. Wetland species are defined as FAC, FACW, or OBL after Reed (1988).

9.2.5.3 SPECIES RICHNESS

A minimum of 15 species from the list of target species will be planted in established wetlands (Table 9-5). The list of approved wetland plant species is presented in Table 7-5. Site-specific planting lists are provided in Appendix E. If the list needs to be refined based on plant

availability prior to planting, Caltrans will provide the resource agencies with a copy of any changes to the list prior to planting to confirm that the minimum number of species is being included.

9.2.5.4 HYDROPERIOD

The hydroperiod for established wetlands will be within ±10% of the hydroperiod for monitoring reference sites at Year 5 for Group 1 and Year 10 for Group 2 (Table 9-5).

9.2.5.5 ABSOLUTE COVER BY INVASIVE PLANTS

Invasive plant cover, as defined in Chapter 8, will be monitored concurrently with percent cover for wetland and native wetland species in the establishment sites. A list of invasive species known or with the potential to occur in the mitigation areas and which will be targeted for control is provided in Table 8-1. For all establishment sites, cover by invasive plants will be less than 5% of the absolute cover of all plants (Table 9-5).

9.2.6 Wetland Rehabilitation

Wetland rehabilitation will occur on existing wetlands on the offsite mitigation properties only. Wetland rehabilitation mitigation actions vary depending on location. The majority of wetland rehabilitation areas will be grazed to promote the establishment of native wetland species. The grazing plan is presented in Appendix Q.

The remaining wetland rehabilitation areas will not be grazed and will be treated using one of five rehabilitation actions described in Chapters 6 and 7. The performance standards for grazed areas are the same as for ungrazed wetland rehabilitation areas and are listed in Table 9-6.

9.2.6.1 WETLAND REHABILITATION—GRAZED AREAS

Wetland rehabilitation on grazed parcels will occur only on the offsite mitigation properties. The success of rehabilitated wet meadow habitat will be measured by performance standards for:

- CRAM biotic attribute values.
- Absolute cover by invasive plants (Table 9-6).

Two monitoring methods will be used to evaluate invasive plant cover: Level 2 CRAM sampling protocols and Level 3 line transect sampling. Level 2 sampling is discussed under CRAM Biotic Values and Level 3 under Absolute Cover by Invasives.

Secondary metrics for BM habitat and beneficial uses/water quality were developed for the rehabilitated wetlands. The secondary metrics are described in Section 9.2.4 and Section 9.2.10, respectively.

CRAM BIOTIC VALUES

Baseline CRAM surveys were performed in 2011 in all wetland habitat on the offsite mitigation parcels, including both the designated grazed and ungrazed areas. The results were presented in the baseline report (California Department of Transportation 2011).

The performance standards for the wetlands to be grazed were developed based on the baseline CRAM survey results and will be measured using the same methods used for the baseline surveys. The plant mosaic complexity, co-dominant plant species, and percent invasion by invasive species attributes of the CRAM wet meadow module will be measured in the CRAM AAs used for the baseline surveys. The locations of the wet meadow AAs that will be monitored are shown in Appendix I.

The same performance standards will be applied to each CRAM attribute. Seventy-five percent of the CRAM AAs that had a baseline score of 3 or 6 will need to improve to a score of 9 or better by Year 10. The performance standard for CRAM AAs that scored a 9 or better for the baseline surveys is no degradation below baseline scores for all of these AAs (Table 9-6).

The remaining CRAM AAs (i.e. the CRAM AAs that do not show a categorical improvement) will not degrade below baseline scores for each attribute (Table 9-6).

ABSOLUTE COVER BY INVASIVE PLANTS

Invasive plant cover, as defined in Chapter 8, will be monitored in the wetland rehabilitation areas to be grazed. A list of invasive species known or with the potential to occur in the mitigation areas and which will be targeted for control is provided in Table 8-1.

Line transect surveys also will be performed in the CRAM AAs to evaluate invasive plant species cover. The performance standard for invasive plant cover will be no increase over baseline of the absolute cover (Table 9-6).

9.2.6.2 WETLAND REHABILITATION—UNGRAZED AREAS

Wetland rehabilitation on ungrazed parcels will occur only on the offsite mitigation properties. The success of rehabilitated wetlands will be measured by performance standards for:

- CRAM biotic attribute values.

- Absolute cover by invasive plants (Table 9-6).

The performance standards for the CRAM biotic values and absolute cover by invasive plants in the ungrazed parcels are the same as those used for the grazed parcels. Secondary metrics for BM habitat and beneficial uses/water quality were developed for the rehabilitated wetlands. The secondary metrics are described in Section 9.2.4 and Section 9.2.10, respectively.

9.2.7 Riparian Establishment

Riparian establishment will occur on Category I and II Riparian Corridors on the offsite mitigation areas. Riparian establishment areas will be monitored annually for 10 years (Table 9-7). The success of riparian establishment will be measured by performance standards for:

- Plant survival.
- Plant vigor.
- Percent vegetation cover.
- CRAM.

The performance standards for the offsite riparian establishment are listed in Table 9-7. The secondary metric for beneficial uses/water quality was developed for riparian establishment. The secondary metric is described in Section 9.2.10.

9.2.7.1 PLANT SURVIVAL

All plants planted as part of mitigation efforts (including replacement plants) will be monitored to assess survival rates, with monitoring results reported separately for each offsite riparian establishment area. Naturally recruited plants will not be included as part of plant survival monitoring because inclusion would skew the monitoring results, which focus on survival of planted material. Planted material will have a minimum of 60% survival at Year 5.

The plant survival performance standard will be replaced in Year 5 by percent vegetation cover performance standards, which will be monitored in Years 5, 6, 8, and 10 and will include both planted and naturally recruited vegetation. This shift is appropriate because as riparian habitat develops and plants mature, a canopy begins to develop and individual plant assessment becomes less relevant to overall ecological success. In addition, the intent of riparian establishment efforts is to increase the cover on Categories I, II, and III Riparian Corridor streams; accordingly, a direct assessment of cover is desirable to determine whether mitigation efforts are successful.

9.2.7.2 PLANT VIGOR

All plants planted as part of mitigation efforts (including replacement plants) will be monitored during Years 1 through 5 to assess vigor, with monitoring results reported separately for each offsite riparian establishment area. Naturally recruited plants will not be included as part of plant vigor monitoring because inclusion would skew the monitoring results, which focus on vigor of planted material.

The determination of vigor will include disease symptoms, low-density foliage, atypical leaf color, stem and foliar vigor (e.g., signs of desiccation, leaf curl), browsing or other wildlife-related damage, and vandalism. A vigor rating of *good, fair* or *poor* (values of 3.0, 2.0, and 1.0, respectively) will be assigned to each plant. Dead plants will not be assigned a vigor rating. These ratings are defined below.

- **Good (3.0):** a plant with less than 25% of its aboveground growth exhibiting one or more of the factors listed above.
- **Fair (2.0):** a plant with 25–75% of its aboveground growth exhibiting one or more of the factors listed above.
- **Poor (1.0):** a plant with more than 75% of its aboveground growth exhibiting one or more of the factors listed above.
- **Dead:** a plant that does not appear capable of growth.

For planted material to be considered alive, plant vigor must be greater than 1.0 for Years 1–4 and equal to or greater than 2.0 at Year 5.

9.2.7.3 PERCENT VEGETATION COVER

The percent vegetation cover (i.e., relative canopy cover) in the riparian establishment areas for planted and naturally recruited native tree and shrub species by vegetative strata must be 50% at Year 10 (Table 9-7).

9.2.7.4 CRAM BIOTIC VALUES

Baseline CRAM surveys were performed in 2011 Category I, II, and III Riparian Corridors on the offsite mitigation areas. The results were presented in the baseline report (California Department of Transportation 2011).

The performance standards were developed based on the baseline CRAM survey results and will be measured using the same methods used for the baseline surveys. The structure patch richness,

topographic complexity, vertical biotic structure, horizontal interspersion and zonation, and invasive species attributes of the CRAM riverine module will be measured in the CRAM AAs used for the baseline surveys. The locations of the riverine AAs that will be monitored are shown in Appendix J.

The performance standards vary depending on the CRAM attribute.

BIOTIC ATTRIBUTES – VERTICAL BIOTIC STRUCTURE, HORIZONTAL INTERSPERSION AND ZONATION, AND INVASIVE SPECIES ATTRIBUTES

The same performance standards will be applied to vertical biotic structure, horizontal interspersion and zonation, and invasive species attributes. Seventy-five percent of the CRAM AAs that had a baseline score of 3 or 6 will need to improve to a score of 9 or better by Year 10. The remaining AAs that do not show a categorical improvement will not degrade below their baseline score.

The same performance standards will be applied to the measured attributes for the remaining 25% of CRAM AAs (i.e., CRAM AAs that do not improve beyond the baseline score of 3 or 6 by Year 10) is no degradation below baseline scores of 3 or 6 for all for each attribute (Table 9-7).

PHYSICAL ATTRIBUTES- STRUCTURE PATCH RICHNESS, TOPOGRAPHIC COMPLEXITY

The performance standards for the structural patch richness and topographic complexity attributes were developed because the interagency team determined that the maximum CRAM scores expected for the biotic attributes (i.e., 9 or 12) may not be attainable when applying the riverine module to Little Lake Valley. For example, an improvement of topographic complexity from a baseline of 3 to a 9 may be unrealistic.

Seventy-five percent of the CRAM AAs that have a baseline score of 3 or 6 will need to improvement. Those with a baseline score of 3 will improve to at least a 6 by Year 10. Those with a baseline score of 6 will improve to a 9 by Year 10. . The remaining AAs that do not show a categorical improvement will not degrade below their baseline score.

9.2.8 Other Waters Rehabilitation

Other waters rehabilitation will occur on Category I, II, and III Riparian Corridors on the offsite mitigation areas. Other waters rehabilitation that will take place on the offsite mitigation properties includes the following actions.

- Planting riparian species on Category I–III Riparian Corridors (Appendix C).
- Implementing erosion and headcut repair features (Appendix E).
- Installing cattle exclusion fence along the corridors.

Other waters rehabilitation areas will be monitored annually for 10 years. The success of other waters rehabilitation will be measured by performance standards for:

- Plant survival.
- Plant vigor.
- Percent vegetation cover.
- CRAM.
- Temperature.
- Sediment.

The plant survival, vigor, percent vegetation cover, and CRAM performance standards for the offsite other waters planting areas (i.e., riparian establishment areas) are listed in Table 9-7 and described in Section 9.2.7. The temperature and sediment performance standards for the offsite others water planting areas are listed in Table 9-7.

A secondary metric for beneficial uses/water quality was developed for the rehabilitated other waters. The secondary metric is listed in Table 9-7 and described in Section 9.2.10.

9.2.8.1 TEMPERATURE

Two performance standards for the temperature monitoring metric have been developed for the other waters rehabilitation areas—tree and shrub cover (canopy cover) and percent of effective shade. The sampling locations will be the same as those used for the baseline canopy cover surveys, as described in Section 9.2.12. The performance standard for canopy cover by planted and naturally recruited native tree and shrub species (combined) must be 75% at Year 10 (Table 9-7). The performance standard for percent effective shade for each subreach is to increase effective shade to 80% or, in cases where baseline is already at 80% or higher, to maintain

baseline cover values. An exception for this performance standard is along Davis Creek (subreaches CC-23 and CC-24), where there is currently no effective shade present in July or August. In these subreaches, the performance standard for effective shade at Year 10 is reduced to 70%. Monitoring results will be reported separately for each sampling point.

9.2.8.2 SEDIMENT

Sediment monitoring will be performed at and in the vicinity of the five erosion repair sites (Table 9-7). The erosion repair sites are to demonstrate an increase in stability and condition over baseline surveys. Additionally, all sites documented in the technical memorandum that summarized the assessment of erosion sites on the offsite mitigation parcels (Appendix N) must remain stable compared to baseline conditions and not contribute to excessive sedimentation. Any sites that begin contributing excessive sediment would need to be remediated (i.e., a large blowout). Monitoring results will be reported separately for each erosion repair site.

9.2.9 Oak Woodland Establishment

Oak woodland will be established on the Watson East parcel. The success of established oak woodland habitat will be measured by performance standards for plant survival and plant vigor (Table 9-8). Established oak woodland habitat will be monitored over a 10-year timeframe at Years 1–5, 6, 8, and 10.

9.2.9.1 PLANT SURVIVAL

Each plant that was planted as part of mitigation efforts will be monitored to assess survival rates (replacement plants are not included in this monitoring). Naturally recruited plants will not be included as part of plant survival monitoring because inclusion would skew the monitoring results, which focus on survival of planted material. A minimum of 50% of planted trees and shrubs must be alive in Year 10 (Table 9-8).

9.2.9.2 PLANT VIGOR

All plants planted as part of mitigation efforts (including replacement plants) will be monitored to assess vigor. Naturally recruited plants will not be included as part of plant vigor monitoring because inclusion would skew the monitoring results, which focus on vigor of planted material. For planted material to be considered alive, plant vigor must be greater than 1.0 for Years 1–6 and 8, and equal to or greater than 2.0 at Year 10 (Table 9-8).

Table 9-8. Established Oak Woodland Habitat—Performance Standards

Habitat Characteristic	Performance Standards		Performance Standards	
	Monitoring Year	Standard	Monitoring Year	Criterion
Plant survival by percentage survival of original number planted (includes replacement plants), by species	1	90%	10	50%
	2	80%		
	3	70%		
	4	60%		
	5	60%		
	6	55%		
	8	55%		
Plant vigor by species (both planted and replacement plants)	1–5, 6, 8	Greater than 1.0	10	Equal to or greater than 2.0

9.2.10 Surface Water Quality

An MRP No. R1-2010-0066 (dated August 6, 2010) was issued by the NCRWQCB as a condition of the CWA Section 401 Water Quality Certification and requires the monitoring and assessment of waters of the State (wetlands, streams, and riparian areas) and the submittal of technical reports. Baseline data collected under this MRP will be used to determine whether the bypass, both during and after construction, is in compliance with the Basin Plan, California's anti-degradation policy in State Water Board Resolution No. 68-16, and the EPA's established sediment and temperature TMDLs for the Upper Main Eel River and tributaries (including Outlet Creek). In the future, the baseline conditions of surface water quality established in this report will be used for comparison to detect project-related water quality impacts and also to evaluate mitigation-related enhancement of water quality conditions. Baseline data will be used to determine and revise the site-specific performance standards for the mitigation actions. Water quality data will be evaluated as compared to all applicable water quality objectives.

The objective of surface water quality monitoring is to provide Caltrans and the NCRWQCB with baseline information concerning the conditions and quality of waters of the State and concentration trends in and adjacent to the proposed bypass alignment and the associated mitigation area. Caltrans began implementing a surface water quality sampling program in August 2010. This program is ongoing and is projected to continue, at a minimum, through summer 2012. The sampling locations are shown on Figure 5-4.

Caltrans prepared a draft surface water quality report and submitted it to NCRWQCB in January 2012 (California Department of Transportation 2012). This report is a supplement to the 2010 baseline report (California Department of Transportation 2011). The report included an analysis of sampling results for August 2010 through April 2011. The surface water quality report is

under review by NCRWQCB; therefore, specific technical information related to water quality is not included in this MMP.

NCRWQCB will use the surface water quality report, as revised based on NCRWQCB and pending additional data analysis, to update the MRP. The revised MRP will identify the water quality sampling protocols and present the water quality performance standards (primary metrics). The revised MRP is expected to be completed subsequent to the commencement of bypass construction.

9.2.11 Bioassessment

Bioassessment surveys were conducted in the impact area and mitigation area to collect baseline data as required by the MRP. Data were collected using SWAMP guidelines and methods. The surveys included collecting field measurements to assess the existing conditions for algae, benthic macroinvertebrates, physical habitat, and chemical and water quality constituents. In the future, the baseline bioassessment conditions established in this report will be used to assess potential changes in stream channel ecosystems as a result of project construction and mitigation activities, as well as to assess potential changes to the biological integrity of streams under the project's mitigation and monitoring program.

Caltrans prepared the Willits Bypass Project Final Bioassessment Report in May 2012. The final biosassessment report includes a summary of the monitoring objectives, an analysis of results, and recommended performance standards.

The final bioassessment report has been provided to NCRWQCB for review, and specific technical information related to water quality is not included in this MMP. NCRWQCB will use the bioassessment report, including their revisions, to update the MRP. The revised MRP will identify any recommended changes to sampling protocols and performance standards. The MRP is expected to be completed subsequent to the commencement of bypass .

9.2.12 Canopy Cover (Shade) Surveys

An analysis of maximum site shade potential (effective shade) is required for riparian corridor mitigation areas in order for Caltrans to comply with the MRP that was issued as a condition of the CWA Section 401 water quality certification.

Baseline canopy cover (shade) conditions were evaluated to better understand both the effective shade and possible solar radiation under pre- and post-construction and mitigation conditions.

This information also is anticipated to aid in present and future correlation with other monitoring indicators, such as target water temperatures. The monitoring locations are shown on Figure 5-6.

Caltrans has prepared a draft technical memorandum that summarizes the August 2011 baseline effective shade surveys (California Department of Transportation 2012). Additional surveys were be performed in August 2012. The canopy cover report wasprovided to NCRWQCB for review. NCRWQCB will use the canopy report to update the MRP. The revised MRP will identify any recommended changes to sampling protocols and performance standards. The revised MRP is expected to be completed subsequent to the commencement of bypass construction.

9.3 Summary of All Monitoring Actions

Table 9-9 contains a list of all the monitoring required for the onsite reestablishment. Table 9-10 contains a list of all the monitoring required for the offsite establishment and rehabilitation areas.

Table 9-9. Monitoring Requirements for Onsite Mitigation Areas

Location	Monitoring Requirements
All Monitoring Locations	Qualitative data on general site conditions
	Photo monitoring stations
Reestablished Wet Meadow Wetlands (Groups A and B)	Wetland species cover
	Species richness
	Wetland hydrology
	Invasive species cover
Reestablished Wet Meadow Wetlands (Group C)	Relative percent cover by wetland species
	Relative cover by native wetland plant species from the list of target species
	Species richness
	Hydroperiod
	Absolute cover by invasive plants
Reestablished Riparian Wetlands and Other Waters Habitat	Plant survival
	Plant vigor
	Percent vegetation cover of native trees and shrubs
	Hydroperiod (wetlands only)

Table 9-10. Monitoring Requirements for the Offsite Mitigation Areas

		All Monitoring Locations		Established Wetlands					Rehabilitated Wetlands: Grazed Areas		Rehabilitated Wetlands: Ungrazed Areas		Established Riparian Habitat and Rehabilitated Other Waters and Riparian Habitat					Baker's Meadowfoam Rehabilitation			North Coast Semaphore Grass Establishment			North Coast Semaphore Grass Rehabilitation			Oak Woodland Establishment	
Offsite Mitigation Parcel	**APN**	**Qualitative Data on General Site Conditions**	**Photo Monitoring Stations**	**Relative Percent Cover by Wetland Species**	**Relative cover by Select Native Wetland Plant Species**	**Species Richness**	**Hydroperiod**	**Absolute Cover by Invasive Species**	**CRAM Biotic Attribute Value**	**Absolute Cover by Invasive Species**	**CRAM Biotic Attribute Value**	**Absolute Cover by Invasive Species**	**Plant Survival**	**Plant Vigor**	**Percent Vegetation Cover of Native Trees**	**Percent Vegetation Cover by Native Shrubs**	**Plant Vigor**	**Population Distribution and Abundance**	**Absolute Cover by Other Native Plant Species**	**Invasive Species**	**Plant Survival and Vigor of Transplants**	**Plant Survival and Vigor of Container Plants**	**Invasive Species**	**Population Distribution and Abundance**	**Absolute Cover by Woody Vegetation in the Understory**	**Invasive Species**	**Plant Survival**	**Plant Vigor**
Arkelian	103-230-04	X	X						X	X														X	X	X		
Benbow	108-020-06	X	X	X	X	X	X	X	X	X								X	X	X								
	108-030-07	X	X						X	X	X	X						X	X	X								
	108-040-13	X	X	X	X	X	X	X			X	X	X	X	X	X	X											
	007-010-04	X	X								X	X	X	X	X	X	X											
	007-020-03	X	X								X	X	X	X	X	X	X											
Brooke	108-020-03	X	X										X	X	X	X	X										X	X
	038-020-11	X	X										X	X	X	X	X										X	X
	108-030-01	X	X										X	X	X	X	X										X	X
	038-040-09	X	X																								X	X
Ford	108-010-06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
	108-020-04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
	108-030-02	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
	108-010-05	X	X						X	X	X	X	X	X	X	X	X	X	X	X								
	108-030-05	X	X								X	X	X	X	X	X	X											
Frost	108-070-04	X	X						X	X			X	X	X	X	X	X	X	X				X	X	X		
Goss	103-230-02	X	X	X	X	X	X	X	X	X								X	X	X				X	X	X		
Huff	037-204-RW	X	X																									
Huffman	108-040-08	X	X						X	X											X	X	X					

Table 9-10. Continued

Offsite Mitigation Parcel	APN	All Monitoring Locations		Established Wetlands					Rehabilitated Wetlands: Grazed Areas		Rehabilitated Wetlands: Ungrazed Areas		Established Riparian Habitat and Rehabilitated Other Waters and Riparian Habitat					Baker's Meadowfoam Rehabilitation			North Coast Semaphore Grass Establishment			North Coast Semaphore Grass Rehabilitation			Oak Woodland Establishment	
		Qualitative Data on General Site Conditions	Photo Monitoring Stations	Relative Percent Cover by Wetland Species	Relative cover by Select Native Wetland Plant Species	Species Richness	Hydroperiod	Absolute Cover by Invasive Species	CRAM Biotic Attribute Value	Absolute Cover by Invasive Species	CRAM Biotic Attribute Value	Absolute Cover by Invasive Species	Plant Survival	Plant Vigor	Percent Vegetation Cover of Native Trees	Percent Vegetation Cover by Native Shrubs	Plant Vigor	Population Distribution and Abundance	Absolute Cover by Other Native Plant Species	Invasive Species	Plant Survival and Vigor of Transplants	Plant Survival and Vigor of Container Plants	Invasive Species	Population Distribution and Abundance	Absolute Cover by Woody Vegetation in the Understory	Invasive Species	Plant Survival	Plant Vigor
Lusher	108-030-03	X	X						X	X			X	X	X	X	X	X	X	X								
	038-060-08	X	X								X	X	X	X	X	X	X											
	108-030-04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							X	X	X		
MGC Plasma North	103-230-06	X	X	X	X	X	X	X	X	X								X	X	X				X	X	X		
MGC Plasma Middle	103-250-14	X	X	X	X	X	X	X	X	X	X	X																
Nance	108-050-06	X	X						X	X	X	X	X	X	X	X	X	X	X	X								
Niesen	108-040-02	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
Taylor	037-210-16	X	X																									
	037-210-65	X	X																									
Watson	037-250-05	X	X								X	X																
	037-221-30	X	X	X	X	X	X	X	X	X	X	X						X	X	X							X	X
Wildlands	108-060-01	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
	108-020-07	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
	108-060-02	X	X						X	X	X	X	X	X	X	X	X	X	X	X								
	108-030-08	X	X						X	X	X	X	X	X	X	X	X	X	X	X								
	108-070-08	X	X						X	X	X	X	X	X	X	X	X	X	X	X								
	108-070-09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								

Chapter 10 Monitoring Requirements

To ensure that reestablished, established, and rehabilitated mitigation is progressing toward the performance standards established in this MMP (Chapter 9), qualified biologists will monitor the mitigation using standard, easily reproducible monitoring methods that are known and accepted by the scientific community and regulatory agencies. Four types of monitoring will be conducted.

- *Baseline surveys* will be used to assess the progress of the onsite mitigation area and offsite mitigation parcels against pre-project (i.e., pre-disturbance) conditions.
- *Performance standard monitoring* will be used to assess the progress of the onsite and offsite mitigation toward meeting performance standards.
- *Reference site monitoring* will be used to identify environmental trends at the onsite mitigation area and the offsite mitigation properties.
- *Project impact minimization monitoring* will be used to evaluate the progress of transplanted NCSG and reapplied topsoil containing BM.

These four types of monitoring and their associated monitoring methods are described below.

10.1 Baseline Surveys

Caltrans performed baseline surveys for several biological and physical resources during 2010 and 2011. Baseline surveys for NCSG, BM, cover by native and invasive wetland plant species, and water quality continued in 2012. Caltrans will perform additional baseline surveys in spring 2013 for cover by invasive wetland plant species to establish a baseline for invasive plants. The invasive plants baseline will set the performance standard threshold.

The baseline survey results for data collected through spring 2011 were presented in the baseline report (California Department of Transportation 2011). The baseline report also describes the monitoring methods, data analysis, and results for each biological and physical resource monitored. The primary goals of collecting and presenting the baseline survey results are to identify the extent, abundance, and condition of resources on the onsite mitigation areas and the offsite mitigation parcels and to assist in the development of performance standards.

The baseline surveys conducted for the baseline report and other studies are summarized in the following sections. Additional information is available in the baseline report, in Chapter 5 of this report, and other pertinent monitoring and inventory reports.

10.1.1 Listed Plant Surveys

Caltrans performed baseline surveys for BM and NCSG to facilitate the process for CDFG to determine whether the project's long-term mitigation and monitoring program will adequately mitigate impacts after construction of the bypass. Field data collected on BM and NCSG were used to establish a baseline condition as part of developing performance standards for these species (Chapter 9). Information pertaining to the sampling methods is presented in the baseline report and is summarized in Chapter 5 of this report.

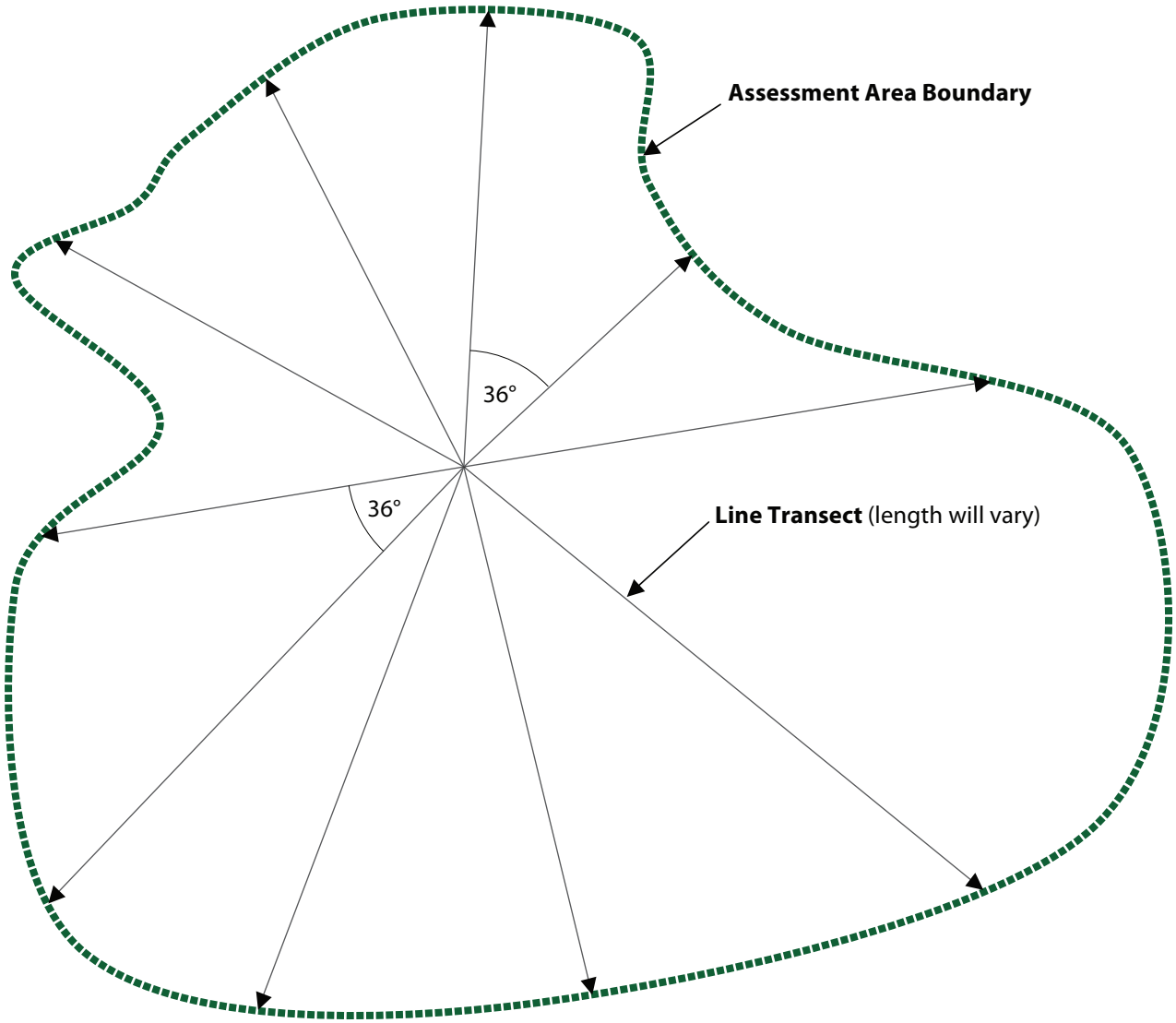
The baseline survey results were presented in the project's baseline report (California Department of Transportation 2011). Baseline population and abundance surveys for BM in the bypass project alignment and the offsite mitigation areas were performed during 2007, 2009, and 2011. Caltrans will perform additional baseline surveys for BM in spring 2012.

NCSG baseline conditions include data recorded during surveys in 2010. Caltrans performed habitat assessment surveys for NCSG populations in 2011 to better understand the conditions under which this species occurs. Caltrans also implemented a pilot study in the NCSG establishment area in December 2011. The study included transplanting NCSG from the bypass footprint and planting NCSG container stock propagated from seeds collected in the establishment areas. Caltrans will monitor the pilot study and perform additional habitat surveys in the NCSG establishment and rehabilitation areas in spring 2012.

10.1.2 CRAM Surveys

CDFG and NCRWQCB requested that baseline data be collected and presented for several parameters using CRAM. New baseline conditions field data were collected in the project area and mitigation area to assess ecological conditions of wetlands in the study area and as a metric for future mitigation monitoring for the project. The CRAM survey results are presented in the 2011 baseline report (California Department of Transportation 2011). Information pertaining to the sampling methods is presented in the baseline report and is summarized in Chapter 5 of this report.

The CRAM baseline survey objectives were to generate sufficient baseline information about aquatic resources and special status–plant conditions to develop mitigation performance standards.



Notes:

1. Not to scale
2. Ten transects will radiate from a center point. Transects will be spaced 36 degrees apart.
3. One plot per transect; add plots per transect until line flattens.

Graphics/Projects/00635.09 Willits/MMP STATE (01-13) SS

Figure 10-1
Line Transect Methodology for Invasive Species Monitoring in Wet Meadow AAs

10.1.3 Wetland Plant Species Cover and Invasive Species Surveys

Line transect surveys also will be performed in the ungrazed wetland rehabilitation areas outside the CRAM AAs. Spring 2012 monitoring was performed to determine the existing total relative cover by wetland species and relative cover by native wetland species from the list of target species for each mitigation unit. Invasive species cover values will be recorded during these surveys. Additional information on the sampling method for these surveys is provided in Section 10.2.6.

10.1.4 Groundwater Monitoring

Groundwater monitoring was conducted at monthly intervals from December 2010 through March 2011. In April and May 2011, data were collected twice a month. Groundwater wells were installed in representative wet meadows on parcels in the bypass area and the mitigation area. In the mitigation area, groundwater wells were installed in representative wet meadows on each parcel to capture variations in soils and topography; however, where soil and topography conditions are relatively homogenous across parcels (e.g., Benbow parcels), groundwater wells were not installed on each parcel. Groundwater wells also were installed near sites where wetland establishment is proposed. The groundwater monitoring results were presented in the baseline report and will be used by Caltrans to develop site-specific plant palettes based on soil and groundwater conditions.

10.1.5 Wet Meadow Inundation Monitoring

Inundation of the wet meadow portion of each parcel in the project and offsite mitigation areas was monitored through field measurement of the surface area of ponding. Field measurement included the surface area extent, depth, and duration of ponding. Water depth was measured at several points in each inundated wetland area. Inundation data were collected from December 2010 through March 2011 at monthly intervals. In April and May 2011, data were collected twice a month. Duration was estimated from a combination of inundation maps and streamflow depth records from adjacent stream stations. The onsite and offsite wet meadow inundation mapping results are present in Appendices G and H, respectively.

The wetland inundation monitoring results were presented in the baseline report and will be used by Caltrans to develop site-specific plant palettes based on ponded water and saturated soil conditions.

10.1.6 Canopy Cover Surveys (Effective Shade)

An analysis of maximum site shade potential is required for riparian corridor mitigation areas in order for Caltrans to comply with the MRP. Baseline canopy cover (shade) conditions were evaluated in August 2011 to better understand both the effective shade and possible solar radiation under pre- and post-construction and -mitigation conditions. This information also is anticipated to aid in present and future correlation with other monitoring indicators, such as target water temperatures. Additional baseline surveys were performed in August 2012.

Caltrans presented the 2011 survey results in a canopy cover report in February 2012 (California Department of Transportation 2012). The report was provided to NCRWQCB for review. NCRWQCB will use the canopy report, as revised based on NCRWQCB, to update the MRP. The revised MRP will identify any recommended changes to sampling protocols and performance standards. The completion date for the revised MRP is expected subsequent to the commencement of bypass construction.

10.1.7 Surface Water Quality Baseline Surveys

The objective of surface water quality monitoring is to provide Caltrans and the NCRWQCB with information concerning the conditions and quality of waters of the State and concentration trends in and adjacent to the proposed bypass alignment and the associated mitigation area. Caltrans began implementing a surface water quality sampling program in August 2010. This program is ongoing and is projected to continue, at a minimum, through summer 2012. The sampling locations are shown on Figure 5-4.

Caltrans prepared a draft surface water quality report and submitted it to NCRWQCB in January 2012 (California Department of Transportation 2012). This report is a supplement to the 2010 baseline report (California Department of Transportation 2011), included an analysis of sampling results for August 2010 through April 2011, and provided raw data for the May 2011 through August 2011 sampling period. The surface water quality report is under review by NCRWQCB. NCRWQCB will use the surface water quality report, as revised based on NCRWQCB and pending additional data analysis, to update the MRP. The revised MRP will identify the water quality sampling protocols and present water quality performance standards. The completion date for the revised MRP is expected to occur subsequent to the commencement of bypass construction .

10.1.8 Bioassessment Baseline Surveys

The objective of the bioassessment surveys is to provide the NCRWQCB with information concerning the baseline condition of streams located in the impact area and the offsite mitigation areas located in Little Lake Valley. The primary goal of collecting and presenting the bioassessment data is to assist in the development of performance standards and to determine an appropriate Benthic Index of Biological Integrity (B-IBI) to be used for the creeks in the impact and mitigation areas located in Little Lake Valley.

The bioassessment surveys were conducted in the impact area and mitigation area to collect baseline data as required by the MRP. The surveys included collecting field measurements to assess the existing conditions for algae, benthic macroinvertebrates, physical habitat, and chemical and water quality constituents. In the future, the baseline bioassessment conditions established in this report will be used to assess potential changes in stream channel ecosystems as a result of project construction and mitigation activities, as well as to assess potential changes to the biological integrity of streams under the project's mitigation and monitoring program.

Bioassessment surveys were performed in summer 2010, spring 2011, and summer 2011. The final bioassessment report is a supplement to the 2010 baseline report (California Department of Transportation 2011). The final bioassessment report has been provided to NCRWQCB for review. NCRWQCB will use the bioassessment report, as revised based on NCRWQCB, to update the MRP. The revised MRP will identify any recommended changes to sampling protocols and performance standards. The completion date for the revised MRP is expected to occur subsequent to the commencement of bypass construction.

10.2 Performance Monitoring Surveys

Performance monitoring will be conducted for reestablished, established, and rehabilitated mitigation habitat to assess the progress of the habitat toward meeting the performance standards presented in Chapter 9. This section identifies the monitoring schedule and monitoring methods for the following mitigation actions:

- Wetland reestablishment.
- Riparian and other waters reestablishment.
- NCSG establishment.
- NCSG rehabilitation.
- BM rehabilitation.

- Wetland establishment.
- Wetland rehabilitation (grazed areas).
- Wetland rehabilitation (ungrazed areas).
- Riparian establishment.
- Riparian rehabilitation
- Other waters rehabilitation.
- Oak woodland establishment.

This section also identifies the primary and secondary monitoring metrics that apply to each mitigation action. Monitoring metrics are described in Section 9.1, Primary and Secondary Monitoring Metrics, and are shown in Tables 9-1 through 9-7.

The monitoring schedule will vary according to habitat type. Reference sites will be monitored concurrently with mitigation. The monitoring schedule for each mitigation action is summarized in tables under the monitoring methods sections below for each mitigation action.

Monitoring methods will vary according to habitat type and will include landscape photodocumentation at permanent stations. The monitoring methods that will be used during performance monitoring are described below by habitat type.

10.2.1 Wetland Reestablishment (Wet Meadow)

Performance monitoring of reestablished wet meadow wetlands will focus on vegetation, and Group C wetlands also will include wetland hydrology monitoring. The habitat characteristics and the monitoring schedule are summarized in Table 10-1 and are discussed in more detail in subsequent sections. The wetland reestablishment monitoring metrics are all primary metrics. No secondary metrics were identified (Table 9-1).

Reestablished wetlands will be monitored in the onsite mitigation where the habitat occurs. Reestablished wet meadow wetland habitat will be monitored in April–May of each monitoring year to coincide with the flowering periods of most wetland species (Table 10-1). In addition, as part of other data to be collected, general site conditions will be assessed and photodocumentation will be conducted in Years 1–5 for reestablished wet meadow.

Table 10-1. Performance Monitoring Schedule for Reestablished Wetlands and Other Waters

Habitat Type and Habitat Characteristics	Monitoring Years	Monitoring Period
Group A and Group B Reestablished Wet Meadow Wetland		
Wetland species cover	1–5	April–May
Species richness	1–5	April–May
Invasive species cover	1–5	April–May
Group C Reestablished Wet Meadow Wetland		
Relative cover by wetland plant species	1–5	April–May
Relative cover by native wetland plant species from the list of target species	1–5	April–May
Species richness	1–5	April–May
Hydroperiod	1-5	November–May
Absolute cover by invasive species	1-5	April–May
Reestablished Riparian Wetland		
Plant survival	1–5	April–May
Plant vigor	1–5	April–May
Percent absolute vegetation cover by native tree species	5, 6, 8, 10	August–September
Percent absolute vegetation cover by native shrub species	5, 6, 8, 10	August–September
Hydroperiod	1-10	November–May
Reestablished Other Waters (Non-Wetland Riparian)		
Plant survival	1–5	August–September
Plant vigor	1–5	August–September
Percent absolute vegetation cover by native tree species	5–10	August–September
Percent absolute vegetation cover by native shrub species	5–10	August–September

Performance standard monitoring of reestablished wet meadow wetlands will vary depending on the size of the individual mitigation unit. Monitoring for all reestablished wetlands will occur in Years 1–5. As described in Chapter 9, the reestablished wet meadow wetlands are divided into three groups (Groups A–C). Performance standard monitoring of Group A and Group B wetlands will focus on wetland species cover and invasive species cover. Each Group A and B wetland reestablishment site will be assessed for meeting associated wetland performance standards using a visual pass/fail assessment of that particular total wetland reestablishment area. The assessment will be performed at one representative sample point in each Group A and B wetland reestablishment site. Group A and B wetlands will be visually inspected for wetland species cover, species richness, invasive species, and obvious problems with reestablishment.

Performance standard monitoring of Group B wet meadow wetlands will focus on wetland species cover, invasive species cover, and wetland hydrology. Each Group B wetland reestablishment site will be assessed for meeting associated wetland performance standards. The assessment will be performed at one representative sample point in each Group B wetland reestablishment site. The assessment will follow the protocols of a standard USACE wetland delineation and may be recorded on a wetland delineation or like form. If the site meets the

parameter for wetland plant species according to the wetland delineation protocol, no further analysis is necessary. If the wetland plant species parameters are not met, an assessment of soils and hydrology, beginning with the wetland delineation protocol, will be used to determine the reason for lack or low wetland species cover. Potential remediation measures, when necessary, also will be recorded.

Performance standard monitoring of Group C wetlands will focus on relative cover by wetland plant species, relative cover by native wetland plant species from the list of target species, species richness, hydroperiod, and absolute cover of invasive species (Table 10-1).

Each Group C wetland reestablishment site will be assessed for meeting associated wetland performance standards. The assessment will be performed using permanently established sampling transect(s) with quadrats for vegetation sampling (including annual monitoring for invasive species) and characterization points for hydrology and soil morphology. The transect/quadrat monitoring method for the wetland reestablishment sites will be the same as that used for the established wetlands. Remediation measures, when necessary, also will be recorded.

10.2.1.1 Groups A and B Wetland Reestablishment

Wetland Species Cover

Wetland species cover will be monitored in Group A and Group B reestablished wetlands (Table 10-1). Results will be presented individually for each onsite mitigation unit. Wetland species cover will be estimated at representative sampling points at each sampling location as described above. Wetland species cover will be visually estimated at each sampling location. Wetland plant cover composition is not restricted to the list of target species (Table 7-5).

Species Richness

Species richness will be monitored in Group A and Group B reestablished wetlands (Table 10-1). Results will be presented individually for each onsite and offsite mitigation unit. Species richness will be visually estimated at each sampling location.

Invasive Species Cover

Invasive species cover will be monitored in Group A and Group B reestablished wetlands (Table 10-1). Results will be presented individually for each onsite and offsite mitigation unit. Invasive species cover will be estimated visually at the same sampling points used for estimating wetland species cover.

WETLAND HYDROLOGY

Wetland hydrology will be monitored at the Group A and Group B reestablishment sites only if an individual site does not meet the parameter for wetland plant species according to the wetland delineation protocol (Table 10-1). If the wetland plant species parameter is not met, an assessment of soils and hydrology will be performed, beginning with the wetland delineation protocol, to determine the reason for the absence of or low wetland species cover.

10.2.1.2 GROUP C WETLAND REESTABLISHMENT

RELATIVE COVER BY WETLAND PLANT SPECIES

Relative cover by wetland plant species will be monitored in Group C reestablished wetlands (Table 10-1). Results will be presented individually for each onsite mitigation unit.

Relative cover provided by planted, seeded, and naturally recruited wetland plant species for each reestablished wetland will be monitored using randomly selected 1–square meter quadrats placed along permanent 100-meter-long transects. If wetland dimensions do not accommodate a 100-meter transect, the transect length will be shortened to the dimensions of the wetland. A maximum of five transects will be field-located for each acre of reestablished.

The endpoints of each transect will be permanently marked in the field using metal t-posts or other method. Transect endpoints will be documented using global positioning system (GPS) units.

The relative cover of all species will be visually estimated in each quadrat. Only plants rooted within a quadrat will be used to estimate the cover value for that species. The relative value of all hydrophytic species of all quadrats will be summed and divided by the number of quadrats to determine the average relative cover by wetland species for reestablished wetlands.

RELATIVE COVER BY NATIVE WETLAND PLANT SPECIES FROM LIST OF TARGET SPECIES

Relative cover by native wetland plant species from the list of target species will be monitored in Group C reestablished wetlands (Table 10-1). Results will be presented individually for each onsite and offsite mitigation unit.

Relative cover by selected native wetland plant species will be estimated using the same method as that used for estimating relative cover by wetland plant species. Relative cover data for native wetland plant species from the list of target species will be collected concurrently with relative cover data for wetland plant species.

Species Richness

Species richness will be monitored concurrently with relative cover monitoring (Table 10-1). Species richness will be monitored in Group C reestablished wetlands. Results will be presented individually for each onsite and offsite mitigation unit.

Species richness will be monitored using the same transects and quadrats used for determining relative cover as well as by performing a relevé survey in each reestablished wetland. In the quadrats, species richness will be determined by identifying, to the extent feasible, all plants in each quadrat to the species level and developing a cumulative list for each reestablished wetland. A list of all species recorded by the relevé survey will be recorded for reestablished wetlands. The species lists will be combined to identify the number of species observed in each reestablished wetland. Only those species from the list of target species will contribute to determining species richness.

Hydroperiod

The hydroperiod will be monitored in Group C reestablished wetlands (Table 10-1). Results will be presented individually for each onsite mitigation unit. The hydroperiod will be the same hydrology type (i.e., frequency class [e.g., very long–duration subsurface saturation]) as characterized during baseline surveys. Hydroperiod monitoring will include determining the extent of ponding and soil saturation once cumulative rainfall has reached approximately 5 inches (typically November).

Inundation depths will be measured at one fixed point for each reestablished wetland using a staff gage and/or shallow groundwater monitoring wells. To the extent possible, digging soil pits to determine shallow groundwater levels will be avoided to minimize disturbance of the reestablished wetlands.

Absolute Percent Cover by Invasive Species

The absolute cover by invasive plants will be measured in the sampling quadrats as well as by performing relevé surveys throughout each sampling unit (Table 10-1). The location and size of invasive plant populations will be recorded using a GPS receiver.

Other Data

In addition to the monitoring described above, general site conditions will be visually assessed during each monitoring visit. Site conditions will be documented using permanent photodocumentation stations.

10.2.2 Riparian Wetland and Other Waters Reestablishment

Reestablished riparian wetland and other waters (non-wetland riparian habitat) will be monitored in the onsite mitigation area where these mitigation habitats occur. Results will be presented individually for each onsite mitigation unit. Reestablished riparian habitats will be monitored according to the schedule presented in Table 10-1. The reestablishment monitoring metrics are all primary metrics. No secondary metrics were identified (Table 9-1).

Performance standard monitoring of riparian plantings initially will focus on plant survival and plant vigor in Years 1–5 and then shift to percent relative vegetation cover by native tree species and percent relative vegetation cover by native shrub species in Years 5–10. This approach is appropriate because as riparian habitat develops and plants mature, a canopy begins to develop and individual plant assessment becomes less relevant to overall ecological success.

10.2.2.1 PLANT SURVIVAL

Plant survival monitoring will be conducted at the reestablished riparian planting areas (Table 10-1). Results will be presented individually for each onsite mitigation unit. Each plant that was planted as part of mitigation efforts will be monitored for survival (replacement plants are included in this monitoring). Naturally recruited plants will not be included as part of plant survival monitoring because inclusion would skew the monitoring results, which focus on survival of planted material.

Identifying individual species' survival rates will determine whether any single species is becoming dominant or does not appear to be well-suited for a particular mitigation unit. The determination of survival rates will be based on the total number of plants of that species originally planted at each mitigation site. Plants will be recorded as dead if no viable aboveground growth is visible. For example, if all the leaves on a tree are brown, but an examination of the stems and branches shows viable stem tissue, the plant will be considered alive, although it may be given a low vigor rating.

10.2.2.2 PLANT VIGOR

Plant vigor will be monitored concurrently with plant survival (Table 10-1). Results will be presented individually for each onsite mitigation unit. Each plant that was planted as part of mitigation efforts will be monitored to assess vigor (replacement plants are included in this monitoring). Naturally recruited plants will not be included as part of plant vigor monitoring because inclusion would skew the monitoring results, which focus on vigor of planted material.

The determination of vigor will entail consideration of disease symptoms, low-density foliage, atypical leaf color, stem and foliar vigor (e.g., signs of desiccation, leaf curl), browsing or other wildlife-related damage, and vandalism. A vigor rating of *good, fair,* or *poor* (values of 3.0, 2.0, and 1.0, respectively) will be assigned to each plant. Dead plants will not be assigned a vigor rating. These ratings are defined below.

- **Good (3.0):** A plant with less than 25% of its aboveground growth exhibiting one or more of the factors listed above.
- **Fair (2.0):** A plant with 25–75% of its aboveground growth exhibiting one or more of the factors listed above.
- **Poor (1.0):** A plant with more than 75% of its aboveground growth exhibiting one or more of the factors listed above.
- **Dead:** A plant that does not appear capable of growth.

10.2.2.3 Percent Vegetation Cover by Native Trees and Shrubs

Percent vegetation cover by native trees and shrubs will be monitored in Years 5–10 at the reestablished riparian planting areas (Table 10-1). Results will be presented individually for each onsite mitigation unit. Naturally recruited plants will be considered under percent vegetation cover monitoring because they will contribute to native riparian habitat cover.

The line-intercept method will be used to record the relative vegetation cover by native tree and shrub species; wherever a native tree or shrub intersects the line transect, the distance the plant (or group of plants) spans on the measuring tape will be recorded. Tree and shrub cover will be recorded separately to determine the percent canopy cover provided by trees and by shrubs. Areas with nonnative tree and shrub cover, as well as areas with no tree or shrub cover, will be recorded. This process will be repeated along the entire length of the transect.

Vegetation strata will be as defined in the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region* (U.S. Army Corps of Engineers 2008).

10.2.2.4 Other Data

In addition to the monitoring described above, total canopy area will be determined in Year 10. Aerial photographs will be taken in the summer of monitoring Year 10 and used in the field to map the edge of riparian trees and shrubs in reestablished riparian planting areas. The resulting polygons will be measured to determine the total area of canopy extent.

Qualitative data will be collected during each monitoring visit on general site conditions. Site conditions will be documented using permanent photodocumentation stations.

10.2.3 North Coast Semaphore Grass

10.2.3.1 North Coast Semaphore Grass Establishment

The NCSG establishment area will be monitored in April–May of each monitoring year to coincide with the species' flowering period. The establishment area will be monitored annually in Years 1–10. Performance monitoring will focus on plant survival and vigor and invasive species. The habitat characteristics and the monitoring schedule are summarized in Table 10-2. The NCSG establishment area monitoring metrics are all primary metrics. No secondary metrics were identified (Table 9-2).

Plant Survival

Plant survival and vigor monitoring will be used to track the survival and growth of a subset of transplant and container stock as well as seeded areas (Table 10-2). Each NCSG plant that was transplanted from the nearby bypass footprint or planted from container stock will be monitored for survival. Replacement plants, if applicable, are included in this monitoring. Naturally recruited plants or grass seedlings that germinate from seeded material will not be included as part of plant survival monitoring because inclusion would skew the monitoring results, which focus on survival of planted material. Plant survival will be recorded using the method described in the NCSG management plan, a separate report being prepared by Caltrans in conjunction with CDFG that focuses on NCSG establishment.

Plant Vigor

Plant vigor will be monitored concurrently with plant survival (Table 10-2). Each plant that was planted as part of mitigation efforts will be monitored to assess vigor. Replacement plants, if applicable, are included in this monitoring. Naturally recruited plants will not be included as part of plant vigor monitoring because inclusion would skew the monitoring results, which focus on vigor of planted material. Plant vigor will be recorded using the method described in the NCSG management plan, a separate report being prepared by Caltrans in conjunction with CDFG that focuses on NCSG establishment.

Invasive Species

The NCSG establishment area will be monitored in Years 1–10 to identify absolute cover by invasive species (Table 10-2). The absolute cover of invasive species will be monitored within

fixed quadrats along permanent transects. The line transects used for the baseline surveys and the subsequent and ongoing vegetation sampling will be used to measure invasive species cover. The transect locations and number of quadrats to be monitored may be adjusted in coordination with CDFG based on the results and recommendations of the current NCSG surveys.

10.2.3.2 North Coast Semaphore Grass Rehabilitation

The NCSG rehabilitation area will be monitored concurrently with wetland rehabilitation monitoring in April–May of each monitoring year to coincide with the species' flowering period. The rehabilitation areas will be monitored annually in Years 1–10.

Performance monitoring of the NCSG rehabilitation areas will focus on population distribution and abundance, absolute cover by woody vegetation, and invasive species. The habitat characteristics and the monitoring schedule are summarized in Table 10-2. The NCSG rehabilitation monitoring metrics are all primary metrics. No secondary metrics were identified (Table 9-3).

Population Distribution and Abundance

NCSG populations will be monitored in Years 1–10 to identify trends in population distribution and abundance (Table 10-2). Population and abundance will be monitored within fixed quadrats along permanent transects.

Absolute Cover by Woody Vegetation in the Understory

The rehabilitation areas will be monitored in Years 1–10 to identify absolute cover by woody vegetation in the understory (Table 10-2). The absolute cover of woody species will be monitored within fixed quadrats along permanent transects. The transect locations and number of quadrats will be the same as that used to collect baseline studies in Spring 2012.

Invasive Species

The NCSG rehabilitation areas will be monitored in Years 1–10 to identify absolute cover by invasive species (Table 10-2). The absolute cover of invasive species will be monitored within fixed quadrats along permanent transects.

10.2.4 Baker's Meadowfoam Habitat Rehabilitation

BM habitat will be monitored in the grazed wetland rehabilitation areas (Appendix C). BM habitat rehabilitation will be monitored concurrently with wetland rehabilitation monitoring

within the wet meadow CRAM AAs. Rehabilitated wet meadow habitat will be monitored in April–May of each monitoring year to coincide with the species' flowering period. BM populations on grazed parcels will be monitored annually in Years 1–10.

Performance monitoring of BM habitat will focus on population distribution and abundance, absolute cover by other native plant species, and invasive species. The habitat characteristics and the monitoring schedule are summarized in Table 10-2. The BM habitat rehabilitation monitoring metrics are all primary metrics. No secondary metrics were identified (Table 9-4).

The monitoring results for each metric will be presented for each CRAM assessment unit. A CRAM assessment unit is composed of the CRAM AAs that occur in a specific geographic area of the offsite mitigation parcels. The purpose of subdividing the CRAM AAs is to distinguish between trends in BM distribution and abundance that might occur in more mesic condition versus those in less mesic conditions. The locations of the CRAM AAs in which BM performance monitoring will occur and the corresponding CRAM assessment units are shown in Appendix I.

10.2.4.1 Population Distribution and Abundance

BM populations will be monitored in Years 1–10 to identify trends in population distribution and abundance (Table 10-2). Population and abundance will be monitored using many of the same AAs used during the baseline surveys. The AAs in which performance monitoring will occur are shown in Appendix I.

Three data collection methods will be used to monitor population and abundance in each AA. The distribution of occupied habitat within the CRAM AAs will be mapped using GPS. The second data collection method will be to estimate the absolute cover of BM in random quadrats within representative polygons in each AA. The third method will be Level 3 data collection within each CRAM AA.

10.2.4.2 Absolute Cover by Other Native Plant Species

The BM CRAM AAs will be monitored in Years 1–10 to identify trends in absolute cover by other native plant species (Table 10-2). Results will be presented for each CRAM assessment unit. Absolute cover by invasive species will be monitored in the same random quadrats in which population distribution and abundance will be monitored. The third method will be Level 3 data collection within each CRAM AA.

10.2.4.3 INVASIVE SPECIES

The BM CRAM AAs will be monitored in Years 1–10 to identify absolute cover by invasive species (Table 10-2). Results will be presented for each CRAM assessment unit.

Three data collection methods will be used to monitor invasive species. The absolute percent cover of invasive species will be visually estimated in each AA. Distinguishable stands of invasive species will be mapped using GPS. The second data collection method will be to estimate the absolute cover of invasive species in the same random quadrats in which population distribution and abundance will be monitored. The third method will be Level 3 data collection within each CRAM AA.

Table 10-2. Performance Monitoring Schedule for North Coast Semaphore Grass and Baker's Meadowfoam Habitat

Habitat Type and Habitat Characteristics	Monitoring Years	Monitoring Period
North Coast Semaphore Grass Establishment		
Plant survival and vigor of transplants	0–10	April–May
Plant survival and vigor of container plants	0–10	April–May
Invasive Species	0–10	April–May
North Coast Semaphore Grass Rehabilitation		
Population distribution and abundance	0–10	April–May
Absolute cover by woody vegetation in the understory	0–10	April–May
Invasive Species	0–10	April–May
Baker's Meadowfoam Rehabilitation		
Population distribution and abundance	0–10	April–May
Absolute cover by other native plant species	0–10	April–May
Invasive Species	0–10	April–May

10.2.5 Wetland Establishment

Performance monitoring of established wetlands will focus on vegetation and wetland hydrology monitoring. The habitat characteristics and the monitoring schedule are summarized in Table 10-3. The wetland establishment monitoring metrics are all primary metrics. No secondary metrics were identified (Table 9-5).

Established wetlands will be monitored in the offsite mitigation areas where the habitat occurs. Established wet meadow wetland habitat will be monitored in April–May of each monitoring year to coincide with the flowering periods of most wetland species. Group 1 wetland establishment areas will be monitored in Years 1–5. Group 2 wetland establishment areas will be

monitored in Years 1–10. General site conditions will be assessed and photodocumentation will be conducted in the wetland establishment areas.

Monitoring methods for established wetlands will focus on relative cover by wetland plant species, relative cover by native wetland plant species from the list of target species, species richness, hydroperiod, and absolute cover of invasive species. The monitoring methods for established wetlands are the same as those described for reestablished Group C wetlands in Section 10.2.1.2, Group C Wetland Reestablishment.

Table 10-3. Performance Monitoring Schedule for Established Wetlands and Oak Woodland

Habitat Type and Habitat Characteristics	Monitoring Years	Monitoring Period
Group 1 Established Wetlands		
Relative cover by wetland plant species	1–5	April–May
Relative cover by selected native wetland plant species	1–5	April–May
Species richness	1	April–May
Hydroperiod	1–5	November–May
Absolute cover by invasive species	1–5	April–May
Group 2 Established Wetlands		
Relative cover by wetland plant species	1–10	April–May
Relative cover by selected native wetland plant species	1–10	April–May
Species richness	1	April–May
Hydroperiod	1–10	November–May
Absolute cover by invasive species	1–10	April–May
Oak Woodland Establishment		
Plant survival	1–8, 10	August–September
Plant vigor	1–5, 6, 8, 10	August–September

10.2.6 Rehabilitated Wetlands—Grazed and Ungrazed Areas

Wetland rehabilitation will occur on existing wetlands on the offsite mitigation properties only (Appendix C). Wetland rehabilitation mitigation actions vary depending on location. The majority of wetland rehabilitation areas will be grazed to promote the establishment of native wetland species. The remaining wetland rehabilitation areas will not be grazed and will be treated using one of five rehabilitation actions described in Chapters 6 and 7. The habitat characteristics and the monitoring schedule are summarized in Table 10-4.

The performance standards for ungrazed wetland rehabilitation areas, as described in the State MMP, will be the same the ones developed for the grazed wetland rehabilitation areas. CRAM surveys, using the wet meadow module, will be used to monitor rehabilitated wetlands.

CRAM biotic attributes and invasive species cover monitoring methods will be used for rehabilitated wet meadow habitat (Table 10-4). Secondary metrics for BM habitat and beneficial uses/water quality were developed for the established wetlands (Table 9-6). The secondary metrics are described in Section 9.2.4 and Section 9.2.10, respectively.

Table 10-4. Performance Monitoring Schedule for Rehabilitated Wetlands, Established Riparian, and Rehabilitated Other Waters

Monitoring Metric	Habitat Type and Habitat Characteristics	Monitoring Years	Monitoring Period
Rehabilitated Wetland (Grazed and Ungrazed Areas)			
Primary Metrics	CRAM biotic attribute values	3, 5, 7, 10	April–May
	Absolute cover by invasive species	2, 4, 5, 7, 9, 10	April–May
Secondary Metrics	Baker's meadowfoam habitat	1-10	April–May
	Beneficial uses/water quality	tbd	tbd
Established Riparian and Rehabilitated Other Waters			
Primary Metrics	Plant survival	1–5	April–May
	Plant vigor	1–5	April–May
	Percent absolute vegetation cover by native tree species	5, 6, 8, 10	August–September
	Percent absolute vegetation cover by native shrub species	5, 6, 8, 10	August–September
	CRAM biotic and physical attribute values (Riverine Module)	3, 5, 7, 10	April–May
	Temperature	Refer to MRP	Refer to MRP
	Sediment	Refer to MRP	Refer to MRP
Secondary Metric	Beneficial uses/water quality	tbd	tbd

10.2.6.1 CRAM BIOTIC AND LEVEL 3 VALUES

Baseline CRAM surveys were performed in 2011 in all wet meadow habitat on the offsite mitigation parcels, including both the designated grazed and ungrazed areas. The results were presented in the baseline report (California Department of Transportation 2011).

All the attributes and metrics of the wet meadow module (Collins et al. 2011) will be recorded for each wet meadow AA; however only the CRAM biotic attributes (plant mosaic complexity, co-dominant plant species, and percent invasion by invasive species metrics) will be used to evaluate rehabilitated wetlands (Table 10-4). The locations of the wet meadow AAs that will be monitored are shown in Appendix I.

For the performance standard monitoring, two levels, or types, of sampling will be applied to evaluate wetlands in the mitigation areas (Levels 2 and 3). CRAM is used for Level 2 data collection and for evaluating wetland conditions in selected AAs. Level 3 sampling consists of

sample plots for baseline monitoring (e.g., quantitative vegetation sampling). Level 3 vegetation data collection will take place within the CRAM AAs (i.e., a "nested sampling design").

Level 3 data to be collected will include relative percent cover of wetland plants, relative percent cover of native plants, species richness, and absolute percent cover of invasive plants. Estimates of plant cover will be made visually based on cover classes. Species richness will be generated by compiling a species list for each sampled AA. Figure 10-2 illustrates the line transect methodology for invasive species monitoring in the wet meadow AAs.

10.2.6.2 ABSOLUTE COVER BY INVASIVE PLANTS

Invasive plant cover, as defined in Chapter 8, will be monitored in the wet meadow rehabilitation areas. Absolute cover by invasive species will be assessed using line transect sampling (Table 10-4). Figure 10-3 illustrates a trend line based on plot samples from the 2011 Level 3 data collection. Transects locations are shown in Appendix L.

LINE TRANSECT SURVEYS

Absolute cover of all plant species, including invasives, will be determined by sampling randomly placed 1–square meter plots along the transects established through each rehabilitation area. Plot sampling will be conducted using a stratified random design. Transects will be stratified by dividing them into 10 equal-sized subtransects. One 1–square meter sample plot will be placed at random in each subtransect, for a total of 10 plots per transect. Within each plot, absolute cover will be estimated for every plant species.

To determine whether the number of plots from each transect is sufficient to allow statistical analysis, the data will be subjected to a trend line analysis. An accurate estimate of the necessary number of plots can be determined by graphing data for percent cover vs. number of plots. The appropriate number of plots corresponds to the point at which the trend line becomes flat (i.e., neither ascending nor decreasing).

At the end of the each transect, the total cover of wetland species will be calculated for each plot. Then the cumulative means will be graphed (i.e., Plot 1, Plots 1 + 2, Plots 1 + 2 + 3, etc.). If the trend line for mean cover across the 10 plots is flat, then sampling for that transect will be considered complete. The trend line will be considered flat if the difference between the means for 9 plots and 10 plots is equal to or less than 1 percent of the mean for 10 plots. If the trend line is not flat, five more plots will be randomly sampled in subtransects 1, 3, 5, 7, and 9. The cumulative means for the additional five plots will be graphed, and again the trend line examined. If the trend line for mean cover has flattened, sampling for that transect will be

considered complete. If the trend line has still not flattened, five more plots will be randomly sampled in subtransects 2, 4, 6, 8, and 10, and sampling for that transect will be considered complete.

Figure 10-3 illustrates a trend line based on plot samples from the 2011 Level 3 data collection. In these sample plots, the trend line has become flat after 10 plots; the difference between mean cover for plots 9 and 10 is 0.7%.

10.2.6.3 Baker's Meadowfoam Habitat (Secondary Metric)

Two of the primary mitigation objectives for rehabilitated wetlands are to improve wetland condition and maintain wetland ecological diversity and control invasive species. One component of the objective to improve ecological diversity is the rehabilitation of BM habitat. The BM monitoring results will be used as a secondary metric to evaluate the success of wetland rehabilitation actions if the primary metrics are not showing the expected results. The BM monitoring methods are described in Section 10.2.4, Baker's Meadowfoam Habitat. The BM performance standards are presented in Table 9-4.

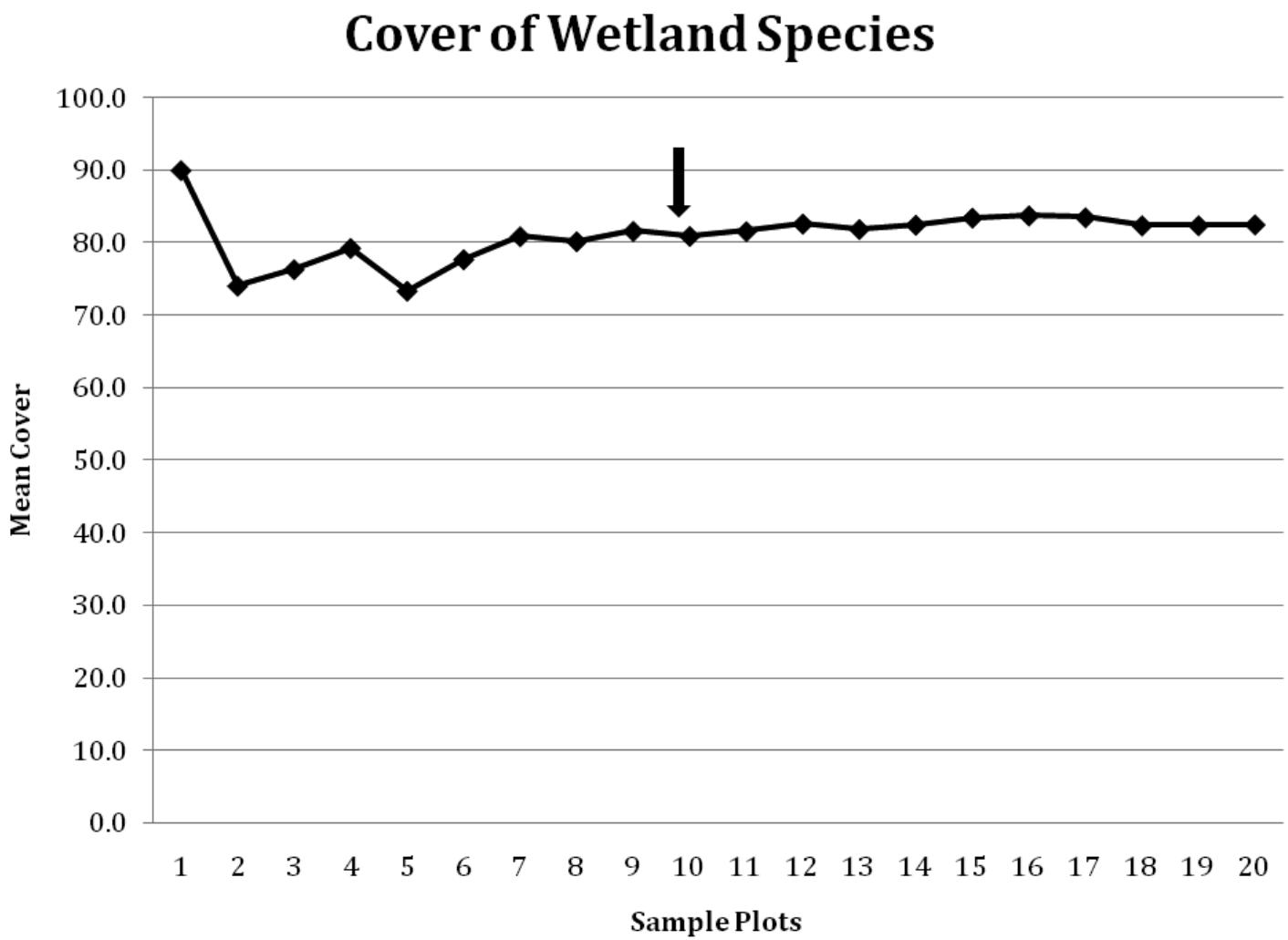
10.2.6.4 Beneficial Uses and Water Quality Objectives (Secondary Metric)

One of the primary mitigation objectives for rehabilitated wetlands is to contribute to and demonstrate positive trends in supporting beneficial uses and water quality improvement in receiving waters. The water quality monitoring results will be used as a secondary metric to evaluate the success of wetland rehabilitation actions. The water quality sampling protocols will be developed by the NCRWQCB, in coordination with Caltrans, and included in the revised MRP. The completion date for the revised MRP is expected to be subsequent to the commencement of bypass construction.

Based on preliminary discussions with NCRWQCB, the water quality constituents that will be considered as secondary metrics are biostimulatory substances, bacteria, toxicity, sediment, turbidity, and settleable materials. Additional information for water quality monitoring is described in Section 10.2.10, Water Quality Monitoring.

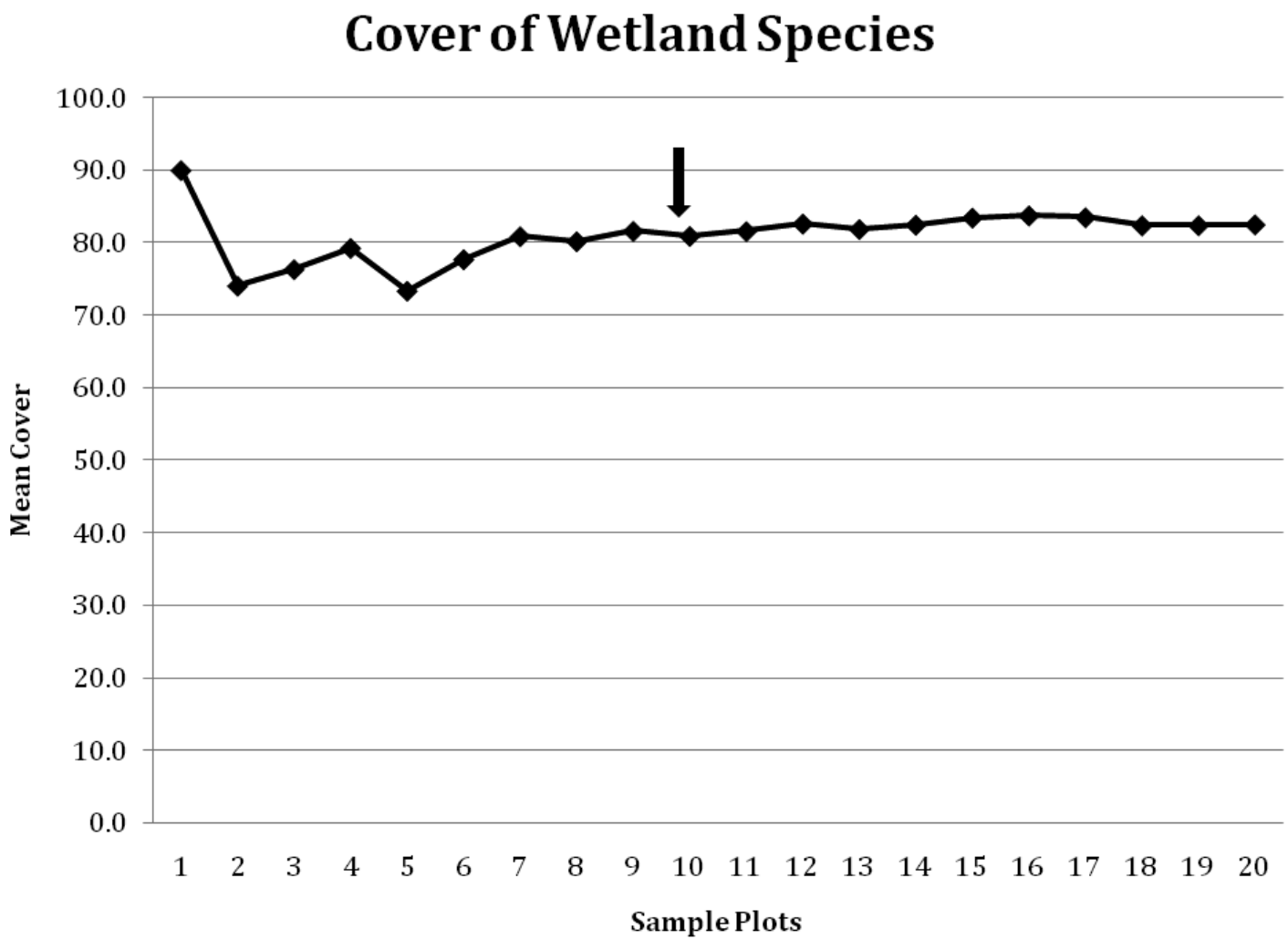
10.2.7 Established Riparian

Established riparian will be monitored on Category I–III Riparian Corridors on the offsite mitigation areas where the habitat occurs. Performance monitoring of established riparian will focus on quantitative vegetation monitoring and CRAM where the riparian areas fall within a



00635.09 Willits/MMP STATE (01-13) SS

Figure 10-2
Trend Line for Mean Cover of Wetland Species along a Hypothetical Transect



00635.09 Willits/MMP STATE (03-11) SS

Figure 10-3
Trend Line for Mean Cover of Wetland Species along a Hypothetical Transect

wetland (Table 9-7). The habitat characteristics and the monitoring schedule are summarized in Table 10-4.

10.2.7.1 Plant Survival, Vigor, and Vegetation Cover

Plant survival and plant vigor will be monitored in April–May during monitoring years 1–5. Percent absolute vegetation cover by native tree and shrub species will be monitored in August–September during Years 5, 6, 8, and 10. Methods for plant survival, vigor, and vegetation cover are the same as those used for reestablished other waters.

10.2.7.2 CRAM Biotic and Physical Values

CRAM surveys will be used to monitor established riparian using the CRAM riverine module (Table 10-4). Baseline CRAM surveys were performed in 2011 in select riparian corridors on the offsite mitigation parcels. The results were presented in the baseline report (California Department of Transportation 2011).

All the attributes and metrics of the riverine module (California Wetlands Monitoring Group 2012) will be recorded for each wet meadow AA, in April–May during Years 3, 5, 7, and 10; however only the CRAM biotic and physical attribute values outlined in this MMP will be used to measure the success of the mitigation. The CRAM attributes for the riverine module (structure patch richness, topographic complexity, vertical biotic structure, horizontal interspersion and zonation, and invasive species metrics) will be used to evaluate established riparian (Table 10-4). The locations of the riverine AAs that will be monitored are shown in Appendix J.

10.2.8 Rehabilitated Other Waters

Other waters rehabilitation will occur on Category I, II, and III Riparian Corridors on the offsite mitigation areas. Other waters rehabilitation that will take place on the offsite mitigation properties includes the following actions.

- Planting riparian species in the riparian establishment planting areas on Category I–III Riparian Corridors (Section 10.2.7, Established Riparian) (Appendix C).
- Implementing erosion and headcut repair features (Appendix E).
- Installing cattle exclusion fence along the corridors.

Performance monitoring of rehabilitated other waters will focus on the primary metrics of quantitative vegetation monitoring, CRAM, water temperature, and sediment monitoring. The secondary metric of beneficial uses/water quality will aid in determining whether the mitigation

effort is successful should the primary metrics not deliver the expected results. The habitat characteristics and the monitoring schedule are summarized in Table 10-4.

10.2.8.1 Plant Survival, Vigor, and Vegetation Cover

The quantitative vegetation monitoring metrics for the established riparian will be used to evaluate the riparian planting component of the rehabilitated other waters. The monitoring methods and schedule are the same as those described for established riparian in Section 10.2.7, Established Riparian.

10.2.8.2 CRAM Biotic and Physical Values

The CRAM surveys for the established riparian will be used to evaluate the riparian planting component of the rehabilitated other waters. The monitoring methods and schedule are the same as those described for established riparian in Section 10.2.7, Established Riparian.

10.2.8.3 Temperature Monitoring

Water temperature monitoring for rehabilitated other waters will occur in monitoring years 1–10 and will be used as a primary metric to assess the effectiveness of the streamside riparian planting, bank and headcut repairs, and removal of cattle grazing on reducing stream water temperatures. Water temperature will be monitored as part of the water quality monitoring program.

The performance standards developed for temperature are tree and shrub cover and the percent effective shade for each subreach monitoring location. The temperature sampling locations will be the same as the baseline sampling locations, and the sampling methods will be performed according to the baseline sampling protocols.

10.2.8.4 Sediment Monitoring

Sediment monitoring for other waters rehabilitation will occur in Years 1–10 and will be used as a primary metric to assess the effectiveness of the streamside riparian planting, bank and headcut repairs, and removal of cattle access from streambanks and creeks on reducing sediment input into stream waters. Sediment levels will be monitored as part of the water quality monitoring program.

The performance standards developed for sediment are to demonstrate (1) an increase in channel stability and condition and (2) that the sites will remain stable compared to baseline monitoring data. The sediment sampling methods will be the same as described in the 2010 erosion

assessment study (Appendix N) and CRAM (physical structure, hydrologic connectivity, and channel stability) baseline sampling protocols.

10.2.8.5 Beneficial Uses and Water Quality Objectives (Secondary Metric)

One of the primary mitigation objectives for rehabilitated other waters is to contribute to and demonstrate positive trends in supporting beneficial uses and water quality improvement in receiving waters. The water quality monitoring results will be used as a secondary metric to evaluate the success of other waters actions. The water quality sampling protocols will be developed by the NCRWQCB, in coordination with Caltrans, and included in the revised MRP. The completion date for the revised MRP is expected to be subsequent to the commencement of bypass construction.

Based on preliminary discussions with NCRWQCB, the water quality constituents that will be considered as secondary metrics are biostimulatory substances, bacteria, toxicity, sediment, turbidity, and settleable materials. Additional information for water quality monitoring is described in Section 10.2.10, Water Quality Monitoring.

10.2.9 Oak Woodland Establishment

Performance monitoring of the established oak habitat will focus on plant survival and plant vigor over a 10-year timeframe at Years 1–5, 6, 8, and 10 at offsite mitigation parcels where this mitigation habitat occurs. Monitoring methods and schedule for plant survival and plant vigor are the same as described above for reestablished other waters habitat. The habitat characteristics and the monitoring schedule are summarized in Table 10-3. The oak woodland establishment monitoring metrics are all primary metrics. No secondary metrics were identified (Table 9-8).

10.2.10 Water Quality Monitoring

Monitoring methods are the same as described under Section 10.1.7.

10.2.11 Bioassessment Monitoring

Monitoring methods are the same as described under Section 10.1.8.

10.2.12 Canopy Cover Monitoring (Effective Shade)

Monitoring methods are the same as described under Section 10.1.6.

10.3 Reference Site Monitoring

Monitoring reference sites have been identified for the onsite mitigation area (Appendix D) and offsite mitigation parcels (Appendix C) based on their ecological and physical similarity to the monitored habitat; these monitoring reference sites will be monitored in conjunction with reestablished, established, or rehabilitated mitigation habitat.

10.3.1 Location of Monitoring Reference Sites

10.3.1.1 Onsite Monitoring Reference Sites

For the onsite mitigation area, four monitoring reference sites will be selected for each of the following mitigation actions.

- Wetland reestablishment sites that will be returned to original grade only (no wetland seed mix and no wetland planting).
- Wetland reestablishment sites that will be returned to original grade, seeded with a wetland seed mix, and planted with wetland plants (Appendix D).
- Wetland and other waters reestablishment sites that will be planted with riparian trees and shrubs and seeded with an erosion control seed mix or seeded with a wetland seed mix (in the viaduct area).

10.3.1.2 Offsite Monitoring Reference Sites

For the offsite mitigation parcels, at least one monitoring reference site has been selected for each of the following mitigation actions: wetland establishment, other waters rehabilitation, and oak woodland establishment (Appendix C).

Wetland establishment reference sites are on those offsite mitigation parcels where Groups 1 and 2 wetland establishment will occur. Some Group 1 or 2 established wetlands will span two or more parcels (e.g., Group 1 wetland on MGC Plasma Middle and North and Goss). In these instances only one reference site will be selected for the established wetland. For a parcel that has more than one establishment site a separate reference site may not be necessary for each establishment site if one reference site is representative of multiple establishment sites. The wetland establishment reference sites will be located in adjacent wetlands that will not be disturbed by mitigation construction.

Other waters rehabilitation (riparian establishment) reference sites are on those offsite mitigation parcels where other waters rehabilitation will occur (Table 10-5). The other waters rehabilitation

reference sites are in existing mature riparian habitat that will not be disturbed by mitigation construction. Some other waters rehabilitation areas will span two or more parcels (e.g., Outlet Creek (Figures 2-1a and 2-1b). In these instances only one reference site will be selected for the rehabilitation area. For a parcel that has more than one establishment site a separate reference site may not be necessary for each establishment site if one reference site is representative of multiple establishment sites.

Table 10-5. Offsite Mitigation Parcels with Monitoring Reference Sites

Parcel	APN	Wetland Establishment[a]	Other Waters Rehabilitation[a]	Oak Woodland Establishment[a]
Arkelian	103-230-04			
Benbow	007-010-04		X	
	007-020-03		X	
	108-020-06	X		
	108-030-07			
	108-040-13	X	X	
Brooke	038-020-11		X	
	038-040-09			
	108-020-03		X	
	108-030-01			
Ford	108-010-05			
	108-010-06	X	X	
	108-020-04	X	X	
	108-030-02	X	X	
	108-030-05		X	
Frost	108-070-04			
Goss	103-230-02	X		
Huff	037-240-RW			
Huffman	108-040-08			
Lusher	038-060-08		X	
	108-030-03		X	
	108-030-04	X	X	
MGC Plasma North	103-230-06			
MGC Plasma Middle	103-250-14			
Nance	108-050-06			
Niesen	108-040-02	X	X	
Taylor	037-210-16			
	037-210-65			
Watson	037-221-30	X		X
	037-250-05			

Parcel	APN	Wetland Establishment[a]	Other Waters Rehabilitation[a]	Oak Woodland Establishment[a]
Wildlands	108-020-07	X	X	
	108-030-08		X	
	108-060-01	X	X	
	108-060-02			
	108-070-08		X	
	108-070-09	X	X	

Note:

a Some Group 1 or 2 established wetland will span two or more parcels. In these instances only one reference site will be selected for the established wetland.

The oak woodland establishment reference site will occur on the Watson East parcel. The oak woodland establishment reference site is in a stand of mature oak woodland habitat that will not be disturbed by mitigation construction.

Monitoring reference sites have not been identified for rehabilitated wetlands on which grazing will occur because existing wetland on the offsite mitigation parcels have been actively managed for grazing or haying and have not fully developed to their ultimate successional state. As a result, there are no undisturbed wetlands that could serve as a reference site.

Reference sites are not proposed on other non-mitigation parcels because most parcels with wet meadow habitat in Little Lake Valley are grazed or hayed. Additionally, it may be difficult to locate parcels with similar wetland hydrology and vegetation cover characteristics. Access to privately owned parcels for use as reference sites would be difficult and possibly unreliable. There is no guarantee the landowner will not develop or alter the reference site in the future, rendering it useless. Consequently, the wetland enhancement areas do not lend themselves to assessment through the use of monitoring reference sites for trend analysis.

Similarly, reference sites are not proposed for ungrazed wetland rehabilitation areas because there are no areas on the mitigation parcels that have been allowed to mature through the different stages of successional development. Instead, areas have been historically managed in a way that arrests development at a certain stage. Identifying reference sites outside of the mitigation properties on private lands is problematic for the same reasons listed above.

10.3.2 Baseline Information for Monitoring Reference Sites

As discussed in Section 10.1, baseline information was collected for rehabilitated and wetland and riparian habitat in 2011 and 2012 to gather more data for performance standards

development. The following discussion presents existing baseline data for the monitoring reference sites.

10.3.2.1 BENBOW (007-010-04)—OTHER WATERS REHABILITATION

Data available for the vicinity of the other waters rehabilitation monitoring reference sites on Benbow parcel 007-010-04 were obtained from the 2009 *Waters of the United States Delineation—California Department of Transportation's Willits Bypass Project Mitigation Sites (#2), State Route 101 in Mendocino County, California* report prepared by Caltrans. The overstory of the riparian vegetation located in the vicinity of the other waters rehabilitation monitoring reference site is dominated by valley oak, willow, and Oregon ash.

10.3.2.2 BROOKE (108-030-01)—OTHER WATERS REHABILITATION

Data available for the vicinity of the other waters rehabilitation monitoring reference site on Brooke parcel 108-030-11 were obtained from the 2009 *Waters of the United States Delineation—California Department of Transportation's Willits Bypass Project Mitigation Sites (#2), State Route 101 in Mendocino County, California* report prepared by Caltrans. The riparian forest occurs adjacent to Upp Creek and consists of an overstory, a shrub understory, and a sparse herbaceous layer. Valley oak and Oregon ash composed the overstory, and Himalaya blackberry, California blackberry, and poison oak were observed in the shrub understory. The sparse herbaceous layer contained tall fescue, spreading rush, and field sedge.

10.3.2.3 FORD (108-010-06)—WETLAND ESTABLISHMENT AND OTHER WATERS REHABILITATION

WETLAND ESTABLISHMENT

Data available for the vicinity of the wetland establishment monitoring site on Ford parcel 108-010-06 were obtained from the 2008 *Biological Resources Report for the Willits Ford Ranch Conservation Bank—Mendocino County, California* prepared by Wildlands, Inc. Dominant plant species in the wet meadow encompassing the wetland establishment monitoring reference site that were identified during the delineation of wetlands and other waters were meadow foxtail (FACW) and Pacific bluegrass (FACW), both of which are considered hydrophytic species. Other dominant plant species reported in wet meadows were camas (FACW), annual hairgrass (FACW), rayless goldfields (OBL), BM (OBL), pennyroyal (OBL), Davy's semaphore grass (OBL), and western buttercup (FACW). The indicators of hydric soils reported in the wet meadow were a low-chroma matrix, listing on a local hydric soils list, and the location of the data sampling point on a hydric landform (i.e., floodplain, basin). Wetland hydrology was either assumed based the presence of low-chroma soils or determined by the presence of a biotic crust

(algal mat) and field observations (e.g., saturation observed in April 2004 in an area that was formally sampled in June 2004).

OTHER WATERS REHABILITATION

Data available for the vicinity of the other waters rehabilitation monitoring reference site on Ford parcel 108-010-06 were obtained from the 2008 *Biological Resources Report for the Willits Ford Ranch Conservation Bank—Mendocino County, California* prepared by Wildlands, Inc. Upland riparian areas were composed of three separate layers (overstory, shrub understory, herbaceous layer). Tree species reported in the overstory were white alder, Oregon ash, valley oak, and arroyo willow. The shrub understory contained Pacific dogwood, Pacific ninebark, Himalaya blackberry, snowberry, and poison-oak. The herbaceous layer contained mugwort, poison hemlock, slender hairgrass, red fescue, cow-parsnip, Pacific bluegrass, and clustered dock.

10.3.2.4 NIESEN (108-040-02)—WETLAND ESTABLISHMENT

Data available for the vicinity of the wetland establishment monitoring reference site on Niesen parcel 108-040-02 were obtained from the 2009 *Waters of the United States Delineation—California Department of Transportation's Willits Bypass Project Mitigation Sites (#2), State Route 101 in Mendocino County, California* report prepared by Caltrans. Dominant plant species in the wet meadow encompassing the wetland establishment monitoring reference site that were identified during the delineation of wetlands and other waters were meadow foxtail (FACW) and field sedge (FACW), both of which are considered hydrophytic species. Other dominant plant species reported in wet meadows were tall fescue (FAC), dense sedge (OBL), spreading rush (FAC), western buttercup (FACW), Mediterranean barley (FAC), meadow barley (FACW), and clustered dock (FACW). A redox dark surface, a positive indicator of hydric soils, was present. Wetland hydrology was determined to be present based on the presence of oxidized rhizospheres along living roots and a positive FAC-neutral test.

10.3.2.5 WATSON EAST (037-221-030)—WETLAND ESTABLISHMENT AND OAK WOODLAND ESTABLISHMENT

WETLAND ESTABLISHMENT

Data available for the vicinity of the wetland establishment monitoring reference site on Watson parcel 037-221-030 were obtained from the 2009 *Waters of the United States Delineation—California Department of Transportation's Willits Bypass Project Mitigation Sites (#2), State Route 101 in Mendocino County, California* report prepared by Caltrans. Hydrophytic plant species (i.e., having a wetland indicator status of FAC or wetter) that were reported as dominant species in the wet meadow encompassing the wetland establishment monitoring reference site

were pennyroyal (OBL), slender rush (FACW), California oatgrass (FACW), perennial ryegrass (FAC), Mediterranean barley (FAC), and sedge (≥FAC). The indicators of hydric soils reported in the wet meadow were redox depressions and the presence of a redox dark surface. Indicators of wetland hydrology observed were an algal mat or crust and oxidized rhizospheres along living roots.

OAK WOODLAND ESTABLISHMENT

Data available for the vicinity of the oak establishment monitoring reference site on Watson parcel 037-221-30 were obtained from the 2009 *Waters of the United States Delineation—California Department of Transportation's Willits Bypass Project Mitigation Sites (#2), State Route 101 in Mendocino County, California* report prepared by Caltrans. According to data recorded during the delineation of wetlands and other waters, the landscape in the vicinity of the oak establishment was dominated by herbaceous species such as perennial ryegrass, yellow star-thistle, and Italian ryegrass. Other herbaceous species observed were bindweed, hedge mustard, Harding grass, clustered dock, little quaking grass, madia, and curly dock.

10.3.2.6 WILDLANDS (108-060-01)—OTHER WATERS REHABILITATION

Data available for the vicinity of the other waters rehabilitation monitoring reference site on Wildlands parcel 108-060-01 were obtained from the 2008 *Biological Resources Report for the Willits Ford Ranch Conservation Bank—Mendocino County, California* prepared by Wildlands, Inc. The upland riparian vegetation description for Ford parcel 108-010-06 also applies to Wildlands parcel 108-060-01 because both parcels were encompassed within both the study area and delineation area described in the 2008 Wildlands, Inc. report. Additionally, specific species observed in upland riparian areas on the Wildlands parcel that were sampled during the delineation of wetlands and other waters were arroyo willow, poison hemlock, Himalaya blackberry, pennyroyal, mugwort, snowberry, and bluegrass.

10.3.3 Rationale for Use of Monitoring Reference Sites

Data collected from the monitoring reference sites will be used as needed for trend analysis. When reviewing monitoring results from mitigation sites, it is important to recognize the cause behind the monitoring result. If the cause is related to site-specific conditions (e.g., failure of supplemental irrigation system) or a design issue (e.g., xeric plants planted in mesic conditions), remedial actions often are undertaken to correct the problem and reset the mitigation on a trajectory toward meeting performance standards. If the cause is related to a landscape-level condition, addressing landscape-level effects on mitigation through early implementation of remedial actions is not advisable from an efficiency standpoint because such effects may be

prolonged (occurring over several seasons) to such a degree that the landscape is changed from its original condition to a new condition.

Determination of the cause is important because it can mean the difference between planning and implementing remedial actions at great cost and effort when such measures cannot overcome the landscape-level cause, and making the reasonable decision under such conditions to refrain from unnecessary action. It is helpful to monitor reference sites at the same time as mitigation sites to determine whether the monitoring reference site is showing a similar response to landscape-level conditions. These data can be important when determining the proper timing and identification of remedial measures.

Two examples of possible outcomes from a trend analysis are discussed below.

- An insect infestation has resulted in extensive plant mortality or low vigor ratings of riparian plantings. Observations on the reference sites indicate that the insect infestation also is occurring along existing riparian corridors. Based on the trend analysis, it is determined that landscape-level, rather than site-specific, factors are affecting the riparian plantings and that control methods implemented for the riparian plantings may not be successful because of the scale of the infestation. Adaptive management efforts may be proposed on the basis of the trend analysis and could include a recommendation to continue with ongoing monitoring to determine whether the infestation naturally resolves itself and affected plants can recover to an acceptable vigor rating.
- Established wetlands do not meet wetland performance standards for several monitoring years. Vegetative cover is sparse or of short stature. Observations in adjacent wetland reference sites indicate that wetland vegetation cover has been decreasing, and the remaining vegetation looks stunted. Based on the trend analysis (which also may include review of rainfall records), it is determined that landscape-level, rather than site-specific, factors are affecting the established wetlands and that remedial actions implemented for the established wetlands may not be successful because of several years of drought-like conditions. Adaptive management efforts may be proposed on the basis of the trend analysis and could include a recommendation to continue with ongoing monitoring to determine whether wetland vegetation conditions improve during years of higher rainfall.

10.3.4 Monitoring Schedule

Monitoring reference sites will be monitored concurrently with mitigation habitat.

10.3.5 Monitoring Methods

Monitoring methods for reference sites will be the same as described in Section 10.2 for performance monitoring of mitigation habitat.

10.4 Photodocumentation

The progress of reestablished, established, and rehabilitated mitigation habitat will be documented photographically using NCRWQCB photodocumentation protocols or similar protocols. Permanent photodocumentation stations will be established. The locations of photodocumentation stations will be determined during the first year of the monitoring period, and the locations will be identified in the field and mapped. Most photodocumentation stations will be permanently marked using metal T-posts or other method. Any photodocumentation stations in the vicinity of the roadway, however, will be identified on a map or by using a GPS receiver but will not be permanently marked for safety reasons.

The number of photographs taken at a given photodocumentation station will vary, depending on the area and habitat. A sufficient number of stations will be established to ensure that the photographs provide a complete visual record of the mitigation sites. Photographs will be taken during monitoring activities. Additional representative photographs may be taken at other times of the year at Caltrans' discretion.

10.5 Monitoring Reports

Caltrans will prepare a monitoring report at the conclusion of each monitoring year and submit it to the resource agencies by December 31. Each monitoring report will include the following information.

- The regulatory agencies' permit numbers.
- A description of the project location.
- A summary of the monitoring methods.
- A list of the names, titles, and affiliations of the people who prepared the content of the report and/or participated in monitoring activities that year.
- A summary and analysis of the monitoring results, including an evaluation of site conditions in the context of performance standards.
- A discussion of modifications made to the monitoring methods (if any).

- A discussion of the monitoring results.
- A discussion of maintenance efforts and any remedial actions implemented since submittal of the previous monitoring report.
- Management recommendations for the following year, including discussion of areas with inadequate performance and recommendations for remedial action.
- An appendix containing photodocumentation of all established, reestablished, or rehabilitated mitigation sites.
- An appendix containing resource agency permits and documentation of any subsequent modification to the MMP.
- An appendix containing the results of impact minimization monitoring of NCSG and BM.

Chapter 11 Long-Term Management Plan

11.1 Purpose

The purpose of the long-term management plan is to ensure that the mitigation is maintained and managed in perpetuity. The management plan establishes the guidance and framework for the management of the day-to-day activities. This plan is a binding and enforceable instrument, implemented by CEs (or deed restrictions with agency approval) covering the mitigation parcels. This plan will take effect after the completion of the performance-monitoring period, once the regulatory agencies have agreed that the mitigation has met the performance standards. The expected activities necessary to manage the offsite mitigation areas are listed below.

- General maintenance activities such as invasive species control.
- Grazing management.
- Clean-up and trash removal.
- Infrastructure management such as gate, fence, road, culvert, signage, and drainage-feature repair.
- Other maintenance activities necessary to maintain the mitigated resource habitat quality and resource-specific long-term maintenance and monitoring activities as described in this MMP.

11.2 Responsible Parties

The responsible parties are described below. CDFG will be the endowment holder, CE holder, and compliance monitor. The MCRCD will be the property owner and Land Manager.

11.2.1 Property Owner

Off-site mitigation properties have been purchased in the name of Caltrans. Caltrans will transfer fee title to the MCRCD. Caltrans, or its designee, will place a CE over the parcels. CE documents will be submitted to Mendocino County for recordation.

11.2.2 Land Manager and Responsibilities

The Land Manager will be the MCRCD. The Land Manager, and subsequent Land Managers, upon transfer, will implement this long-term management plan. Long-term management tasks

will be funded through a non-wasting endowment. The Land Manager responsibilities will include, but are not limited to:

- Ensuring that signage and fencing are maintained.
- Coordinating trash removal.
- Conducting thatch and invasive plant management when necessary with qualified personnel.
- Reviewing monitoring data and recommending and coordinating with the regulatory agencies any remedial action when necessary.
- Maintaining a log for the mitigation properties that will contain a record of all activities, correspondence, and determinations regarding the mitigation.
- Coordinating two general inspections of the mitigation properties per year as required by this plan.
- Coordinating the biological monitoring. This includes arranging the initial aerial photographs for the preservation habitat, as described in Sections 11.5.1 and 11.5.3.
- Arranging for any corrective action necessary to drive the performance of the habitat, as required by this plan.
- Submitting an annual general inspection report, in coordination with the monitoring biologists, regarding the compliance and maintenance status of the mitigation.
- Submitting the biological monitoring reports.
- Working with the regulatory agencies when necessary to carry out the long-term management.

11.2.3 Qualified Personnel/Monitoring Biologist

The Land Manager will retain professional biologists, botanists, hydrologists, geomorphologists, and other types of specialists (the Qualified Personnel, including the Monitoring Biologist) to conduct specialized tasks. The Monitoring Biologist will be familiar with California flora and fauna and will have knowledge regarding the various species of special status and their ecology. The Qualified Personnel/Monitoring Biologist responsibilities may include, but are not limited to:

- Monitoring wetland function and erosion.
- Evaluating the accumulation of thatch and recommending removal, if needed.

- Evaluating the presence of newly introduced invasive plant species and recommending management, if needed.
- Conducting the biological monitoring, collecting data, and preparing reports required by the plan.
- Evaluating site conditions and recommending remedial action to the Land Manager.
- Assisting in reviewing or planning restoration activities, use of the mitigation properties for education, and other tasks such as grant proposals.
- Working with the Land Manager and the regulatory agencies staff.

If there are changes in the Land Manager or Qualified Personnel, the outgoing and incoming personnel will tour the mitigation properties together and the former will advise the latter of trends, problems, and any administrative difficulties.

11.2.4 Endowment Holder

CDFG has agreed to act as the endowment holder. The endowment will be transferred to CDFG by June 30, 2013.

11.2.5 Conservation Easement Holder and Compliance Monitor

CDFG has agreed to act as the CE holder and compliance monitor for the offsite mitigation properties. Caltrans or their designee will provide CDFG with copies of the CE(s) within 30 days after they have been recorded by Mendocino County.

11.3 Management Approach

The general management approach to the long-term maintenance of the mitigation properties will be to maintain quality habitat for each mitigated resource through ongoing monitoring and maintenance of key environmental characteristics. More specifically, an adaptive management approach will be used (if needed) to incorporate changes to management practices, including corrective actions deemed appropriate by the Land Manager. Adaptive management includes those activities necessary to address the effects of climate change, fire, flood, or other natural events, force majeure, etc. Before considering any adaptive management changes to the long-term management plan, the Land Manager will consider whether such actions will help drive the

continued viability of mitigation sites' resources. Refer to Chapter 12 for a detailed discussion of adaptive management.

The overall adaptive management strategy will be to evaluate and work within the constraints of the normal conditions (e.g., ongoing sedimentation due to upstream land use) and natural processes (e.g., meandering creek beds) of the mitigation sites. These normal conditions and natural processes create a dynamic environment. The landscape will be allowed to conform to the dynamic environment as it responds to the normal conditions and natural processes. Adaptive management actions will avoid creating situations that require recurring intervention to redirect or compete with the valley's normal conditions and natural processes. Natural recruitment and succession and type changes in natural resource habitats will be accepted as part of this approach. For example, if a stream begins to meander into a BM population and washes out some of the plants, the creek would not be redirected back to its previous bed and held there by artificial devices. Instead, the area of BM would be lost because of the meandering creek bed as part of the natural processes of the site.

11.4 Conditions That May Warrant Adaptive Management

11.4.1 Changes in Hydrology

Changes in hydrology could be short- or long-term, could be natural or artificial, and include reductions or increases in duration or volume. The Land Manager will evaluate each circumstance and, where it is reasonable and within the scope of the MMP and the control of the responsible parties involved, hydrologic changes will be addressed with appropriate actions. Some of those foreseeable situations, such as flooding and water supply issues, are discussed below.

Typically, winter and early spring flooding of varying extent occurs in Little Lake Valley basin. After large storms, water in the relatively large, upper Outlet Creek drainage basin backs up at the narrow and constricting mouth of Outlet Creek in the north end of Little Lake Valley (CH2M Hill 2006). Additional localized flooding in the valley generally is related to debris and/or erosion problems in the creeks. Flooding was recorded in the Outlet Creek basin during 1907, 1938, 1950, 1955, 1964, 1983, and 1997. The largest recorded flood event in the valley occurred on December 20, 1964, and lasted 84 hours with total precipitation of 18.59 inches (CH2M Hill 2006).

In the case of prolonged flooding, specific actions may not be required, but instead it may be recorded as a type change in a natural resource habitat. Where flood debris is interfering with the

perpetual success of the mitigation, it will be removed; however, in cases where it adds to habitat complexity, it will be retained. Acute sedimentation from large flood events, such as those described in the previous paragraph, will be remediated if it interferes with perpetual success of the mitigation. However, chronic long-term sedimentation, which is a normal condition of Little Lake Valley, will not be removed, and the mitigation will be allowed to adapt naturally in response to that condition, as the existing wetlands have been doing for decades.

In cases where it is clear that an action taken by the Land Manager (or in some cases a lack of action) in order to comply with the long-term management commitments threatens to flood a neighboring property, immediate action will be taken to prevent such flooding. For example, where flood debris related to mitigation threatens to cause a backup of water and potentially flood a neighboring property or threatens culverts, bridges, or other structures, the debris will be removed. The Land Manager will take immediate action to protect the interests of the neighboring properties should they be threatened by actions related to Caltrans' mitigation. In emergency situations, human safety and the protection of private property will take priority over complying with mitigation commitments.

The historical natural water supply of the valley has been reduced by the development of Willits, agricultural drainage projects, and a number of reservoirs in the surrounding hills. Furthermore, California currently is experiencing a statewide water crisis, and northern California's water supply is pressured by the demand to supply southern California's water needs. If a future, widespread increase in private and public projects in and around the valley continues to decrease the natural water supply to the extent that it begins to affect the mitigation, remediation would require the intervention of regulatory agencies and/or other governing bodies because this would be a situation beyond the scope of this mitigation project and the authority of the Land Manager or Caltrans.

11.4.2 Fire

Preserved oak woodlands, which are located in upland and foothill areas, may be susceptible to fire because of the drier conditions typical of those areas. The location of the mitigation, topography, and access to water may present fire suppression challenges.

The lowland mitigation areas in Little Lake Valley where grazing will occur are less likely to be threatened by fire because of prolonged periods of saturation in the valley and the ease of emergency vehicle access to most of the mitigation sites. Despite wetter conditions and easy access, fire potential on the ungrazed mitigation areas could increase because of thatch accumulation over time.

In the event that a fire destroys an establishment, rehabilitation, or preservation site (grazed or ungrazed), the site will be evaluated for damage and monitored for re-growth. Based on the time of year of the fire and extent of damage and plant regeneration, a revegetation or reseeding plan for the planted areas may be drafted and implemented. Revegetation or reseeding would be necessary only in cases where the land was not recovering sufficiently or in time to avoid secondary damage, such as severe erosion, that would be detrimental to the watershed.

11.4.3 Extensive Adjacent Development

Extensive development on adjacent properties may alter current hydrologic regimes supporting the mitigation sites, cause site disturbance that encourages growth and spread of invasive plant species, contribute to fragmentation of sensitive plant populations, involve site alterations that increase erosion or sedimentation in the mitigation site, and/or introduce grazing or other activities or features that pollute or create barriers in shared streams or creeks.

In the event that future development or significant land use changes are proposed on adjacent lands, the Land Manager will coordinate with the owner of the adjacent land, resource agency personnel assigned to that project, local planning department staff, and others to attempt to prevent the goals for the mitigation parcels from being threatened or affected.

In areas where development of an incompatible use adjacent to mitigation sites cannot be avoided, potential negative impacts should be evaluated and remediation steps planned and implemented. Remediation efforts may include those listed below.

- Implementation of buffer zones in the mitigation site, where feasible, to separate biological resources on the mitigation site from adjacent development.
- Installation of cattle barriers.
- Installation of stormwater pollution prevention measures.
- Increase in mowing and weeding schedules.

11.4.4 Other Site Degradation

Other site degradation may include soil erosion and vandalism. Soil erosion that negatively affects established habitats will be dealt with on a case-by-case basis using SWPPP standards. Strategies for dealing with vandalism will include signage, fencing, visual monitoring, and coordination with local law enforcement and other pertinent agencies. Marijuana cultivation has been documented in the past on a mitigation parcel and adjacent privately-owned parcels. The

Land Manger will coordinate with local law enforcement to eradicate marijuana plants should they be found on the mitigation parcels and to deal with individuals associated with this activity.

11.4.5 Education, Public Access, and Habitat Restoration

11.4.5.1 Education and Public Access

The mitigation properties may represent an opportunity to encourage awareness and respect for open space and wildlife habitat in the community. Individuals or groups wishing to use the mitigation properties for educational purposes will obtain the consent of and coordinate with the Land Manager. If the education activities will be passive in nature, such as a discussion of plants and animals, the consent of the Land Manager is sufficient. If active use (other than restoration activities) of the mitigation is envisioned, or passive but regular use of the mitigation is proposed, review and approval of the relevant regulatory agencies are required. To avoid repeated inquiries with the regulatory agencies, a use plan could be developed by the interested party for a one-time approval. The Land Manager has the right to refuse a request to use the mitigation properties if it is determined that the use may have a negative impact on any habitats or wildlife on the mitigation properties.

11.4.5.2 Habitat Establishment/Rehabilitation

In the future, the Land Manager or Caltrans may want to conduct additional habitat establishment or rehabilitation in the mitigation properties. This could include removing nonnative plant species, planting native plants, and other restoration activities. Restoration activities that involve work in wetlands or waters of the State may require a Section 404 permit from the USACE, a 401Water Quality Certification from the NCRWQCB, a 1602 Streambed Alteration Agreement from the CDFG, or other water quality and incidental take permits. An example of an activity that does not require a permit is planting acorns. An example of an activity that would require permits would be re-contouring a creekbank and planting it with riparian species to stabilize an area of erosion. The Land Manager will not notify the regulatory agencies if the activities do not require a permit.

11.4.6 Funding Mechanism and Protection

This section outlines the funding and the restrictions on activities in any off-site mitigation parcel included in the MMP.

11.4.6.1 FUNDING

Current endowment funding for initial and long-term costs associated with offsite mitigation was calculated using a combination of the Property Analysis Record (PAR) program—a tool developed by the Center for Natural Lands Management—and a customized Excel spreadsheet. The PAR is a computerized database method that is extremely effective in helping land managers calculate the costs of land management for a specific project. The PAR helps analyze the characteristics and needs of the property from which management requirements are derived. It helps pinpoint management tasks and estimates their costs and the necessary administrative costs to provide the full cost of managing any property. The PAR generates a concise report that serves as a well-substantiated basis for long-term funding, including endowments, special district fees, and other sources. The PAR was used to help develop the list of necessary tasks, resources, equipment, and unit costs. Unit costs were adjusted if research or experience indicated that a particular PAR unit cost estimate was not suitable for project-specific circumstances. The Excel spreadsheet was used to reorganize, calculate, and track the tasks and costs in a more intuitive, reader-friendly style.

Caltrans will provide the long-term endowment to CDFG, which has agreed to hold it. The long-term endowment will provide the funding necessary for the Land Manager to manage the mitigation properties in accordance with this plan. The long-term endowment principal will provide the income to meet this annual ongoing financial requirement. The long-term endowment does not cover the costs of initial and capital tasks (e.g., construction, short-term maintenance), which are covered under a separate endowment. To see a full breakdown of the endowment refer to Chapter 13.

11.4.6.2 PROHIBITED USES

It is understood that the following activities are prohibited, except as needed to accomplish the management and maintenance activities in this plan. In addition, if any of these activities must be undertaken because of special circumstances, they may be reviewed and approved by the regulatory agencies on a case-by-case basis. A CE also defines prohibited uses, including but not limited to those defined here. A CE will be placed on the mitigation parcels no later than 1 year after the purchase date of the final mitigation parcel. The CE, once recorded, will supersede the list of prohibited uses outlined in this plan. The CE will be held by the CDFG.

ACCESS TO THE MITIGATION AREA

The intent of the long-term management plan is to maintain the mitigation in perpetuity, and limiting public access to the mitigation area will further this goal. Off-trail pedestrian access to the mitigation area should be discouraged through fencing.

REMOVAL OF NATIVE VEGETATION

No killing, removal, or alteration of any existing native vegetation will be allowed in the mitigation area except as described in the CE, this plan, and/or as reasonably necessary for the Land Manager to conduct the land management activities (e.g., remedial grading associated with necessary adaptive management activities, the use of prescribed burns in thatch management).

BURNING AND DUMPING

No burning will be allowed in the mitigation area. This prohibition does not include controlled burning as a method of thatch management. No dumping of rubbish, garbage, or any other wastes or fill materials will be allowed in the mitigation area. This prohibition excludes fill material such as clean dirt or gravel that may be necessary to carry out the land management of the property according to this plan or the CE.

DISKING

The plowing, disking, cultivation, ripping, planting, sowing, irrigation, or any other conversion or disturbance of the mitigation area is prohibited, except for: (1) the grazing of livestock as permitted by the terms of the CE or the grazing management plan for the parcel; (2) the disking for fire prevention at historical levels; or (3) activities to establish, rehabilitate, or preserve the mitigation. Any change in the topography of the mitigation area through the placement of soils, land fill, dredging spoils, or other materials is prohibited, except as incidental and necessary to the activities permitted under the CE or as necessary to rehabilitate, establish, or preserve the mitigation. Notwithstanding any provision of the CE and this plan to the contrary, in no event will any permitted plowing, disking, cultivation, ripping, planting, sowing, irrigation, or any other conversion or disturbance of the mitigation area that impairs the mitigation be allowed.

CHANGES TO ROADS AND TRAILS

Existing roads and trails may be maintained in their current location with the same and/or similar material. No new roads or trails are proposed in the MMP. New roads and trails will not be allowed in the mitigation area unless it is determined by the Land Manager and the regulatory agencies that they will not impair the mitigation.

EQUIPMENT OR FUEL STORAGE

The storage or disassembly of inoperable automobiles, machinery, equipment, trucks, and similar items for purposes of storage, sale, or rental of space for any such purpose is prohibited.

The use, dumping, storage, or other disposal of non-compostable refuse, trash, sewer sludge, or unsightly or toxic or hazardous materials or agrichemicals is prohibited.

Equipment and supplies, such as mowers, fencing supplies, plant stock, and herbicides permitted for use under the CE, etc., necessary to accomplish the management tasks outlined in this plan and CE, may be stored at existing developed sites, such as the house and barns on the southern Benbow parcel. Herbicides permitted under the CE may be stored in the mitigation area, provided that all such use and storage are in compliance with applicable health, safety, and environmental laws and regulations and further provided that all such use and storage do not diminish or impair the mitigation.

CHANGES TO TOPOGRAPHY

Plowing, disking, cultivation, ripping, planting, sowing, irrigation, or any other conversion or disturbance of the mitigation area is prohibited except as set forth in the CE or this MMP.

USE OF PESTICIDES AND CHEMICAL AGENTS

Except as needed for management of the habitat as outlined in this plan and/or the CE, there will be no use of any pesticides, fungicides, insecticides, or any other chemical agents used to kill or suppress plants, animals, or fungi in the mitigation area unless it is determined, after consultation with the regulatory agencies, that it will not impair the mitigation.

USE OF MOTOR VEHICLES

No motorized vehicles will be ridden, used, or permitted on any portion of the mitigation area with the following exception: motorized vehicle use will be restricted to that required for mitigation area maintenance purposes such as habitat management and monitoring, authorized mosquito abatement, and permitted ranching operations and for emergency or law enforcement situations requiring access by medical, fire, or law enforcement vehicles.

CONSTRUCTION ACTIVITIES

No construction will be allowed in the mitigation area with the exception of the activities mentioned in this plan or the CE.

INTRODUCTION OF NONNATIVE PLANTS

Except as expressly permitted by the terms of the CE or this plan, or to rehabilitate, establish or preserve the mitigation, no seeding, planting, or introduction of nonnative grasses, clovers, or any other plant species is permitted. Nonnative plants include invasive species as defined in this MMP. Intentional or reckless introduction of exotic plant or animal species that may, in the Land Manager's determination, threaten to impair the mitigation is prohibited.

11.5 Inspection, Monitoring, and Reporting

11.5.1 Schedule

Long-term monitoring begins (Year 1) when the regulatory agencies have agreed that the mitigation has met the performance standards at the end of the performance (short-term) monitoring period. Commencement of long-term management will not be the same for all mitigation areas because some habitat types require longer performance-monitoring periods than others. In the case of preserved habitat, which has no performance standard monitoring, long-term management begins as soon as any infrastructure upgrades (e.g., fence repair, signage) is complete.

- The Land Manager will conduct two general inspections each year.
- The Land Manager will coordinate aerial photographs of the preserved parcels be taken in Year 1. The photographs will capture the aerial extent of tree canopy cover for comparison with aerial photographs taken in future monitoring years as described in this chapter.
- The Monitoring Biologist will conduct biological monitoring by collecting quantitative data of the mitigation in Years 5, 10, and 15 and every 10 years thereafter.
- Follow-up inspections of the mitigation properties will occur as often as needed to protect the mitigation.

11.5.2 General Inspections

The General Inspections will occur in May and November of each year. Inspections will be conducted by the Land Manager or Qualified Personnel. Inspections will concentrate on an evaluation of the following factors: erosion, fire hazard reduction, fencing integrity, trash accumulation, thatch accumulation, grazing management, invasive species, and evidence of unauthorized use by motor vehicles. The entire perimeter of the mitigation properties will be

covered, as well as meandering transects through its interior. The Inspection Sheet found at the end of this chapter (or one similar) will be used to evaluate the included criteria during each field visit. Previous inspection sheets will be reviewed before each visit to help ensure that a possible or recurring problem area is not missed.

Photo documentation also will be collected. Permanent photo points for taking photographs will be established, and a site map showing the photo point will be prepared for the mitigation project file. Representative photographs will be taken once per year during the same season.

If any problems are identified, follow-up inspections will be done to closely track the problem as well as to track that remedial actions are effective. Evaluation and corrective actions for each factor are described below.

11.5.2.1 Erosion

If it is determined during the inspection that the adjacent stream or sheet-flow runoff is causing any erosion or other adverse effects on the mitigation, immediate standard erosion control measures (such as installation of straw wattles, silt fences, straw bales, etc.) will be implemented. If corrective measures are not effective, the Land Manager will identify the cause(s) of the erosion and develop solutions to prevent further erosion problems.

If erosion is the result of lateral channel migration, further assessment would be required to determine appropriate restoration options, such as biotechnical bank stabilization.

11.5.2.2 Fire Hazard Reduction

Potential wildfire fuels will be reduced as needed by mowing or grazing in the mitigation areas where grazing is allowed. Ungrazed areas will be mowed or hayed only when required by local or State fire control agencies. The site will be maintained as required for fire control while limiting impacts on mitigation.

11.5.2.3 Fencing and Gates

During general inspections, the condition of fences and gates will be recorded. Fences and gates will be maintained as necessary by replacing posts, wire and gates, or other components as needed. Fences and gates will be maintained to prevent casual trespass, allow necessary access, and facilitate grazing regime and management (including cattle exclusion) where applicable.

11.5.2.4 TRASH ACCUMULATION, VANDALISM, TRESPASS

At least twice yearly (once before fall and once after the first heavy rain), trash will be collected from the mitigation areas and legally disposed of. Vandalism and trespass impacts will be repaired and rectified. Sources of trash and trespass will be monitored.

11.5.2.5 UNAUTHORIZED MOTOR VEHICLE USE

The perimeter of the mitigation properties will be inspected for evidence of unauthorized motor vehicle use/access. If necessary, corrective actions such as repairing locks, fences, and gates will be completed by the Land Manager.

11.5.2.6 GRAZING MANAGEMENT

A grazing plan has been developed for the offsite mitigation parcels on which BM and NCSG management areas and certain wetland rehabilitation occur. (Appendix Q). The grazing plan includes grazing goals and objectives and a specific grazing regime. The grazing plan will be implemented during the short-term maintenance period. Once the short-term maintenance period is completed (after completion of performance monitoring and resource agency agreement that all mitigation has met the success criteria), the long-term management period will begin. At this time, the grazing plan and all treatments will be reviewed by the Land Manager to determine whether changes are necessary. MCRCD may need to consult a rangeland specialist if it is suspected that changes are needed. After this review, the grazing plan will be reviewed as often as necessary to determine the need to adjust any of the grazing treatments.

Grazing leases have been established to cover all mitigation areas that require grazing. The leases were developed under the guidance of the grazing management plan and have the flexibility necessary to support an adaptive management approach. During general inspections, the Land Manager will check to see that grazing leases are being followed. If not, the Land Manager will work with the lessee to bring the livestock operation into compliance with the lease. The Land Manager will adjust leases (e.g., stocking rates, season) should it be necessary to support the ongoing health of the mitigation.

11.5.2.7 THATCH ACCUMULATION

The Land Manager or Land Manager's Qualified Personnel will make an annual determination as to the extent of thatch accumulation in the grazed mitigation areas. Suitable thatch level, or RDM level, for a given area is defined in the grazing management plan. If excess thatch is present, the Land Manager and Land Manager's Qualified Personnel will work together to

determine the best removal practice for the site. Several management practices can be used to address this issue, including controlled burning, mowing, and grazing as described below.

Controlled burns: Controlled burning is an excellent way to eliminate accumulated plant matter and also serves to reduce cover of nonnative annual grasses. If a controlled burn is to be used, all necessary agencies, as applicable, will be advised, and the burn will be carried out in a safe and legal manner.

Mowing: Another method to remove thatch is mechanical mowing of the site. In order for mowing to be effective for thatch removal, the cut material must be removed from the site. In addition, the mowing regime should to be timed to minimize the invasion of invasive plant species. To date, little research has been conducted on mowing for thatch management, but mowing would be expected to be effective for thatch management and is probably a realistic management practice for portions of the mitigation properties.

Grazing: Grazing can be used to reduce thatch buildup in both wetland and upland areas. Livestock may be employed in smaller areas to effectively remove unwanted vegetation. Livestock grazing is a powerful vegetation management tool that can be used to manage for ecosystem health; however, used improperly, it can have detrimental effects. Generally a livestock grazing regime is based on four rangeland management strategies: (1) kind and breed of livestock, (2) timing and duration of grazing, (3) stocking rates, and (4) animal distribution. Recommendations for the grazing regime will vary to best meet the management needs for the vegetative community/wildlife habitat and will be flexible to accommodate variation in annual rainfall and other such environmental factors. Grazing practices will be modified as needed, and fencing will be installed to protect sensitive areas such as riparian habitats. If thatch is not being successfully removed through grazing, the stocking rate may be modified on the offsite mitigation parcels where grazing is allowed or interior fences between designated pastures may be permanently or temporarily relocated or added.

11.5.2.8 NONNATIVE AND INVASIVE SPECIES

Before project implementation, the site functioned with a number of nonnative species, some of which have become naturalized. They are predominantly annual species that occur in grasslands. It is unreasonable to require or expect eradication of established nonnative species at the site. The required management of nonnative plants therefore will be limited to the management of newly introduced invasive species and controlling the spread of existing invasive species. Methods of removing or controlling these species are outlined below.

Hand/mechanical: Hand removal or use of small hand-powered or handheld equipment (such as a Weed Wrench or a chainsaw) always should be the preferred method of removing invasive species from the mitigation properties. If hand-removal methods are found ineffective, or the problem is too widespread for hand removal to be practical, mechanical methods (use of larger equipment with motors such as mowers) or biological controls as described below can be used.

Biological controls: The county agricultural commissioner would be the point of contact for use of biological controls in the mitigation properties. If biological control methods are tried and found ineffective or if biological control methods are not available for the target species, herbicides can be used, but only as outlined below.

Herbicides: When using chemical control methods, herbicides will be applied by hand or mechanical means, by the Land Manager or Qualified Personnel during the time of year and at an application rate that allows the least amount of herbicide use yet still eliminates the targeted species. Only herbicides that are approved for aquatic use will be used in or near aquatic areas. Mixing, loading, storing, and rinsing of equipment or containers will not take place in aquatic areas. BMPs that may be used to protect aquatic areas include, but are not limited to: (1) avoid applying herbicides under windy conditions; (2) use ground-based applicators, low tank pressures, and equipment calibration for larger droplet sizes; (3) avoid applying herbicides within 24 hours prior to, or during, rain.

11.5.2.9 MOSQUITO ABATEMENT

The additional wet meadow wetlands establishment on the offsite mitigation parcels is not expected to create a mosquito nuisance, primarily because of mosquitoes' seasonal nature and the lack of longstanding open water. However, if mosquitoes associated with any of the aquatic habitats (such as the existing tule marsh) in the offsite mitigation areas become a nuisance or health hazard, mosquito abatement issues will be addressed through the development of a plan by the Land Manager and the local mosquito and vector control district.

11.5.2.10 CREEK MAINTENANCE

Some of the anadromous fish–bearing creeks in the mitigation property are subject to sedimentation over time. If these creeks are left alone, it is conceivable that they would fill in to the point that they no longer support anadromous fish. This ongoing sedimentation is considered a normal condition of Little Lake Valley because of past and present land use practices. While it is the intent of this mitigation project to work within the constraints of the normal conditions of Little Lake Valley, an exception is made to actively manage the creeks for anadromous fish. A

creek that accumulates enough silt to impede anadromous fish should be excavated, or otherwise corrected, to the extent that it is no longer an impediment.

Siltation of the creeks is not expected to create localized flooding; however, if siltation of a creek threatens a neighboring property (including public structures such as roads and bridges) with flooding, the creek should be excavated, or otherwise corrected, to the extent that it no longer poses a threat.

11.5.3 Biological Monitoring

The approach to the long-term management of the mitigation sites' biological resources is to conduct monitoring of selected characteristics in Years 5, 10, and 15 and then every 10 years thereafter to determine stability and ongoing trends of the preserved, established, and rehabilitated wetlands, BM, NCSG, riparian corridors, and oak woodlands. Monitoring will include abundance surveys for NCSG and BM, aerial canopy cover for riparian and oak woodland, cattle grazing impacts, wetland species plant cover, and select CRAM biotic attributes and will include photomonitoring. While it is not anticipated that major management actions will be needed, an objective of this long-term management plan is to monitor and identify any issues that arise and use adaptive management to determine what actions might be appropriate. If adaptive management actions become necessary, the monitoring schedule may be adjusted to increase the frequency, or follow-up inspections required, to track success. The Qualified Personnel will have the knowledge, training, and experience to accomplish monitoring responsibilities. Biological Monitoring Reports will be provided to the regulatory agencies.

11.5.3.1 LISTED PLANTS

NCSG establishment and rehabilitation sites and BM rehabilitation sites are located primarily in seasonal marshes, vernal pools, swales, and other types of seasonally mesic areas. These sites will require continuous access to a supply of shallow surface water and groundwater during late spring and early summer to allow the completion of the plants' life cycle. To maintain hydrology to these sites, the Land Manager will take steps to attempt to prevent adjacent landowners or developments from re-directing the natural flow of water from the mitigation sites. The Land Manager also will takes steps to attempt to prevent adjacent landowners and developers from directing additional water onto the site if it is considered deleterious to the listed plants.

BM requires a full-sun to partial-shade exposure, and even though it can grow quite tall in conditions where it is forced to compete with tall forbs and grasses to reach the sun, it prefers

open sites with little competition. The BM rehabilitation sites may have to be grazed by cattle under a closely tailored management regime for the purpose of reducing competitive vegetation.

NCSG thrives in partially shaded areas along edges of broadleaf or coniferous forests. Because of its height, which often exceeds 4 feet, the grass does not appear to have much competition. The only serious competitors are Harding grass (*Phalaris aquatica*) and tall fescue (*Festuca arundinacea*) and encroachment of woody vegetation. The establishment and rehabilitation sites will be closely observed for these species and, if they occur at levels that are deemed detrimental to the NCSG, the Land Manager will take actions to reduce and control them. Furthermore, woody understory (vines and shrubs) will not be allowed to expand into areas where it potentially may shade out or otherwise compete with the NCSG.

Other invasive species listed in Table 8-1 in the establishment and rehabilitation sites will be monitored continuously, and if their aerial cover exceeds baseline or these species otherwise compete with the listed plants, their removal will be initiated to reduce them to acceptable limits.

One of the management objectives of the grazing plan is to maintain, and expand if possible, the listed species. If necessary, a rangeland specialist will be consulted to adapt the grazing plan in order to help reach that objective.

The abundance surveys for the listed plants will be performed in the same season outlined in Table 10-2. Surveys for BM will be done sometime during the April/May blooming period. NCSG surveys will be done sometime between April and June, during the blooming period. Environmental conditions such as hydrology, woody species intrusion, and invasive species in the rehabilitated habitats will be recorded and mapped as necessary.

Permanent points for taking photographs will be established, and a site map showing the photo points for the mitigation project file will be prepared. Reference photographs will be taken of each listed plant population with the same frequency as the biological monitoring and at the same time the surveys are conducted.

Data from listed species' habitats will be compared to performance standards required in the final year of the short-term monitoring period (except for invasive species, which is compared to baseline studies conducted in the first year of short-term monitoring or earlier). If a measurement has failed to meet the performance standard, the adaptive management process outlined in Chapter 12 will be used to incorporate changes to management practices, including corrective actions deemed appropriate by the Land Manager, in consultation with the appropriate resource agency when necessary.

11.5.3.2 CATEGORY I RIPARIAN CORRIDOR (PROTECTED FISHERIES)

Impacts on protected fisheries will be mitigated primarily through creation of new riparian areas on critical, poorly vegetated reaches of Outlet Creek and its salmonid stream tributaries. Additional mitigation will be done through fish passage improvements on streams along US 101. During long-term management, Category I Riparian Corridors will be carefully managed, monitored, conserved, and maintained.

As part of the biological monitoring, data will be recorded for riparian canopy cover in the same season outlined in Table 10-4. Aerial photographs will be taken during monitoring years, will be used to determine aerial canopy cover, and will be field-verified. General observations of plant community health and natural recruitment will be documented during field verification. Notes will include observations of wildlife species observed.

Total riparian canopy cover from established habitat will be compared to the total riparian canopy cover data in the final year of the short-term performance-monitoring period (performance standard). If the habitat has dropped below 5% of the performance standard, the adaptive management process outlined in Chapter 12 will be used to incorporate changes to management practices, including corrective actions determined appropriate by the Land Manager, in consultation with the appropriate resource agency when necessary.

Total riparian canopy cover from preserved habitats will be compared to the total riparian canopy cover from the aerial photographs taken in long-term Year 1 (baseline data). If habitat has dropped below 5% of the baseline, an adaptive management process outlined in Chapter 12 will be used to incorporate changes to management practices, including corrective actions determined appropriate by the Land Manager, in consultation with the appropriate resource agency when necessary.

11.5.3.3 WETLANDS

Wetlands will be monitored, conserved, maintained, and managed.

As part of biological monitoring for established wetlands, data will be recorded for relative percent cover by wetland plant species, relative percent cover by native plant species, species richness, hydroperiod, and invasive species in the same season outlined in Table 10-3. General observations of plant community health will be documented during surveys. Notes will include observations of wildlife species encountered. In rehabilitated wetlands, data will be recorded for the select CRAM biotic metrics and invasive species in the same season outlined in Table 10-4.

Permanent points for taking photographs will be established, and a site map showing the photo points will be prepared for the mitigation project file. Reference photographs will be taken of the overall wetland mosaic with the same frequency as the biological monitoring during the month of April. Photos will be included in the monitoring report.

Data from established and rehabilitated wetlands will be compared to the performance standards from the final year of short-term monitoring. If the habitat has dropped below 5% of the performance standards , the adaptive management process will be used to incorporate changes to management practices, including corrective actions deemed appropriate by the Land Manager, in consultation with the appropriate resource agency when necessary.

11.5.3.4 CATEGORY II AND III RIPARIAN CORRIDORS

As part of the biological monitoring, data will be recorded for riparian canopy cover in the same season outlined in Table 10-4. Aerial photographs will be taken during monitoring years, will be used to determine aerial canopy cover, and will be field-verified. General observations of plant community health and natural recruitment will be documented during field verification. Notes will include observations of wildlife species observed.

Total riparian canopy cover from established habitat will be compared to the total riparian canopy cover data in the final year of the short-term performance-monitoring period (performance standard). If the habitat has dropped below 5% of the performance standard, the adaptive management process outlined in Chapter 12 will be used to incorporate changes to management practices, including corrective actions deemed appropriate by the Land Manager, in consultation with the appropriate resource agency when necessary.

Total riparian canopy cover from preserved habitats will be compared to the total riparian canopy cover from the aerial photographs taken in long-term Year 1 (baseline data). If habitat has dropped below 5% of the baseline, the adaptive management process outlined in Chapter 12 will be used to incorporate changes to management practices, including corrective actions deemed appropriate by the Land Manager, in consultation with the appropriate resource agency when necessary.

11.5.3.5 OAK WOODLANDS

Preserved and established oak woodlands at the mitigation project sites will be monitored, conserved, and maintained as described here.

As part of the biological monitoring, data will be recorded for oak woodland canopy cover in the same season as outlined in Table 10-3. Aerial photographs will be taken during monitoring years,

will be used to determine aerial canopy cover, and will be field-verified. General observations of plant community health and natural recruitment will be documented during field verification. Notes will include observations of wildlife species observed.

Total oak woodland canopy cover from established habitat will be compared to the total oak woodland canopy cover data in the final year of the short-term performance-monitoring period (performance standard). If the habitat has dropped below 5% of the performance standard, the adaptive management process outlined in Chapter 12 will be used to incorporate changes to management practices, including corrective actions deemed appropriate by the Land Manager, in consultation with the appropriate resource agency when necessary.

Total oak woodland canopy cover from preserved habitats will be compared to the total oak woodland canopy cover from the aerial photographs taken in long-term Year 1 (baseline data). If habitat has dropped below 5% of the baseline, the adaptive management process outlined in Chapter 12 will be used to incorporate changes to management practices, including corrective actions deemed appropriate by the Land Manager, in consultation with the appropriate resource agency when necessary.

11.5.3.6 EROSION

Caltrans conducted an assessment of existing erosion sites at the offsite mitigation parcels in May 2010 (Appendix N). Forty erosion features were identified. Of those 40, five were recommended for restoration as part of the mitigation because these sites can immediately improve water quality in the area, among other factors outlined in Appendix N.

Long-term monitoring will be conducted for the erosion sites. Visual inspections of the eroding bank and headcut repair sites will be conducted to evaluate the condition and effectiveness of these features in controlling erosion at these sites. If it is determined that the sites are contributing to excessive sediment, the Land Manager will document this as part of the General Inspection Report and begin the adaptive management process outlined in Chapter 12 to rectify the situation.

11.5.4 Reporting and Administration

Annual General Inspection Report: A written report will include, at a minimum, a map of the mitigation area, representative photos documenting the status of the select mitigation areas, a description of proposed activities and maintenance or management actions as required by this plan, observations from the general inspections, an Inspection Sheet (Attachment A), endowment accounting, and recommendations for altered management practices as needed. The annual

General Inspection Report will be submitted to the regulatory agencies and Caltrans by December 30 of each year.

Biological Monitoring Report: This report, covering the biological monitoring, will be written and submitted to the regulatory agencies in Years 5, 10, 15, and then every 10 years thereafter. The report is intended to track whether the mitigation is self-sustaining in perpetuity. It will include the results of the biological monitoring. The report will be submitted to the regulatory agencies and Caltrans by December 30 of each year.

11.6 Task Prioritization

This section establishes a procedure to prioritize tasks in the event that unforeseen circumstances or events result in insufficient funding to accomplish all tasks. The Land Manager and the regulatory agencies will discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order: (1) those required by a local, State, or federal agency or for public safety; (2) those necessary to maintain or remediate habitat quality, such as trash control and vegetation management (grazing, mowing, invasives); and (3) those that monitor resources, particularly if past monitoring has not shown downward trends. Equipment and materials necessary to implement priority tasks also will be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the regulatory agencies and Caltrans.

11.7 Transfer of Responsibilities and Plan Modification

11.7.1 Transfer of Management Responsibilities

Any subsequent transfer of management responsibilities under this long-term management plan to a different land manager will be requested in writing by the Land Manager. The request will be made to the regulatory agencies and Caltrans, which will issue written approval that will be incorporated as an amendment into this long-term management plan. Any subsequent land manager assumes responsibilities described in this long-term management plan and as required in the CE, unless otherwise amended in writing by the regulatory agencies.

11.7.2 Replacement of Land Manager

If the Land Manager fails to implement the tasks described in this long-term management plan and is notified of such failure in writing by any of the regulatory agencies, the Land Manager

will have 90 days to remediate such failure. If failure is not remediated within 90 days, the Land Manager may request a meeting with the regulatory agencies to resolve the failure. Such meeting will occur within 30 days or a longer period if approved by the regulatory agencies. Based on the outcome of the meeting, or if no meeting is requested, the regulatory agencies may designate a replacement land manager in writing by amendment of this long-term management plan. Caltrans must approve of the prospective replacement prior to appointment.

11.7.3 Amendments to Management Plan

The Land Manager, property owner, and the regulatory agencies may meet and confer from time to time, upon the request of any one of them, to revise the long-term management plan to better meet management objectives and preserve the habitat and mitigation goals of the mitigation property. Any proposed changes to the long-term management plan will be discussed with the regulatory agencies and the Land Manager. Any proposed changes will be designed with input from all parties. Amendments to the long-term management plan will be approved by the regulatory agencies in writing, will be required management components, and will be implemented by the Land Manager.

Offsite Mitigation Area Inspection Sheet

Location:_____ **Date:**_____
Inspector:_____
General Observations:_____
_____
_____

Yes	No	Potential Issues
☐	☐	**Erosion** Is there any adjacent sheet-flow drainage causing erosion?
☐	☐	**Fire Hazard Reduction** Are there any fire dangers or hazards at this site?
☐	☐	**Fencing and Gates** Are there any gates or fencing needing repair or replacement?
☐	☐	**Trash Accumulation** Does trash need to be removed?
☐	☐	**Unauthorized Motor Vehicle Use** Is there any unauthorized motor vehicle use identified?
☐	☐	**Grazing Management** Are grazing leases in compliance?
☐	☐	**Disking and Topography** Has any land disturbance occurred?
☐	☐	**Additional Roads and Trails** Have any new roads or trails been created?
☐	☐	**Equipment or Fuel Storage** Is there any equipment or fuel being stored in the mitigation area?
☐	☐	**Pesticides and Chemical Agents** Is there any indication that pesticides, fungicides, insecticides, or any other chemical agents have been used on the mitigation area?
☐	☐	**Construction** Has any construction occurred on the mitigation area?
☐	☐	**Thatch accumulation** Is excess thatch present that is hindering the mitigation values of the property?
☐	☐	**Nonnative Invasive Species** Have any additional invasive plants been introduced?
☐	☐	**Mosquito Abatement** Have mosquitoes become a health hazard?
☐	☐	**Creek Sediment Maintenance** Is sediment in the creeks threatening anadromous fish?

For every YES, document the noncompliance and identify how the situation is to be resolved. For all compliance issues, record the date the landowner was advised of the situation and the steps taken to resolve the issue. Attach to mitigation site inspection sheet.

Date of follow up site visit to determine compliance:_____
☐ ☐ Were all issues resolved?
If no, what additional steps will be taken? Attach to mitigation site inspection sheet.

Chapter 12 Adaptive Management Plan

This chapter presents the general framework for using adaptive management to rapidly detect potential threats to the mitigation design, implement responses to those threats, and assess the effectiveness of those responses.

Adaptive management is appropriate when there is uncertainty in predicting effects or outcomes, when there are clearly defined performance standards, and when there is a commitment to monitor. Thus, it is a critical component of any MMP. The need for adaptive management could be triggered by changed conditions, such as a natural disaster, or by failure to meet performance standards because of the difficulty in predicting effects of the implementation actions.

The adaptive management strategy will be to evaluate and work within the constraints of the normal environmental conditions (e.g., ongoing sedimentation due to upstream land use) and natural processes (e.g., meandering creek beds) of the mitigation sites. These normal conditions and natural processes create a dynamic environment. Mitigation will be allowed to conform to this dynamic environment as it responds to the normal conditions and natural processes. Adaptive management actions will avoid creating situations that require recurring intervention to redirect or compete with the valley's normal conditions and natural processes. Natural recruitment, succession, and type changes in natural resource habitats will be accepted as part of this approach. For example, should a wet meadow receive additional flooding due to changes in hydrology, thus converting a grassy wet meadow to an emergent marsh, adaptive management would not be considered prudent because such a condition constitutes a type change within the same natural resource habitat. Another example is a stream that begins to meander into a BM population and washes out the some of the plants. The creek would not be redirected back to its previous bed and held there by artificial devices. Instead, the area of BM would be lost because of the meandering creek bed as part of the natural processes of the site.

Adaptive management will be performed by MCRCD during the long-term management period, once land management activities have been transferred from Caltrans. Throughout certain phases of adaptive management, MCRCD will inform and consult with the Agency Review Team (ART). The ART consists of Caltrans, CDFG and NCRWQCB. Some mitigation sites covered in this document also satisfy CWA 404 permit and NMFS Biological Opinion (National Marine Fisheries Service 2010). mitigation requirements. If one of these mitigation sites becomes a problem, the Land Manager also will coordinate with the USACE, EPA, and NMFS.

12.1 Adaptive Management Process

The adaptive management protocol is designed to give the Land Manager the flexibility and decision-making power to carry out the majority of activities necessary to respond to problems that arise during short- or long-term management. In most cases the Land Manager will be able to determine the proper response and implement the actions to ensure continued success. There are situations when the Land Manager may elect to seek the advice of the ART, and situations when it is mandatory. This section describes the intent of the flexible nature of this process and certain mandatory requirements.

The protocol includes the descriptions in this section, along with Figure 12-1 and Table 12-1. Figure 12-1 is a flow chart that illustrates the process that the Land Manager will use when adaptive management may be warranted. The process applies to any mitigation type/natural resource and is the same regardless of whether the factors involved are foreseen or unforeseen, or at the landscape or microclimate level. There are four steps in the process.

1. **Adaptive management trigger:** This is the incident that would alert the Land Manager that a problem has occurred and an investigation is needed.
2. **Investigative actions:** These are mandatory actions the Land Manager must take once the adaptive management process has been triggered. Mandatory actions include identifying and mapping the problem and investigating the potential contributing factors. The method of investigation is determined by the Land Manager, but recommended factors to consider are provided throughout this chapter.
3. **Management response plan:** This plan is developed by the Land Manager in response to the findings from the investigation. Depending on the circumstance, this plan may be as simple as a note to file or a more complex, multi-page document shared with the ART.
4. **Reporting:** Regardless of the complexity of the response, it must be documented in the annual monitoring report described elsewhere in this MMP.

Table 12-1 lists the process in tabular format and lists potential responses. This list is intended to be a helpful guide for the Land Manager; it is not a required or exhaustive list of possible appropriate responses.

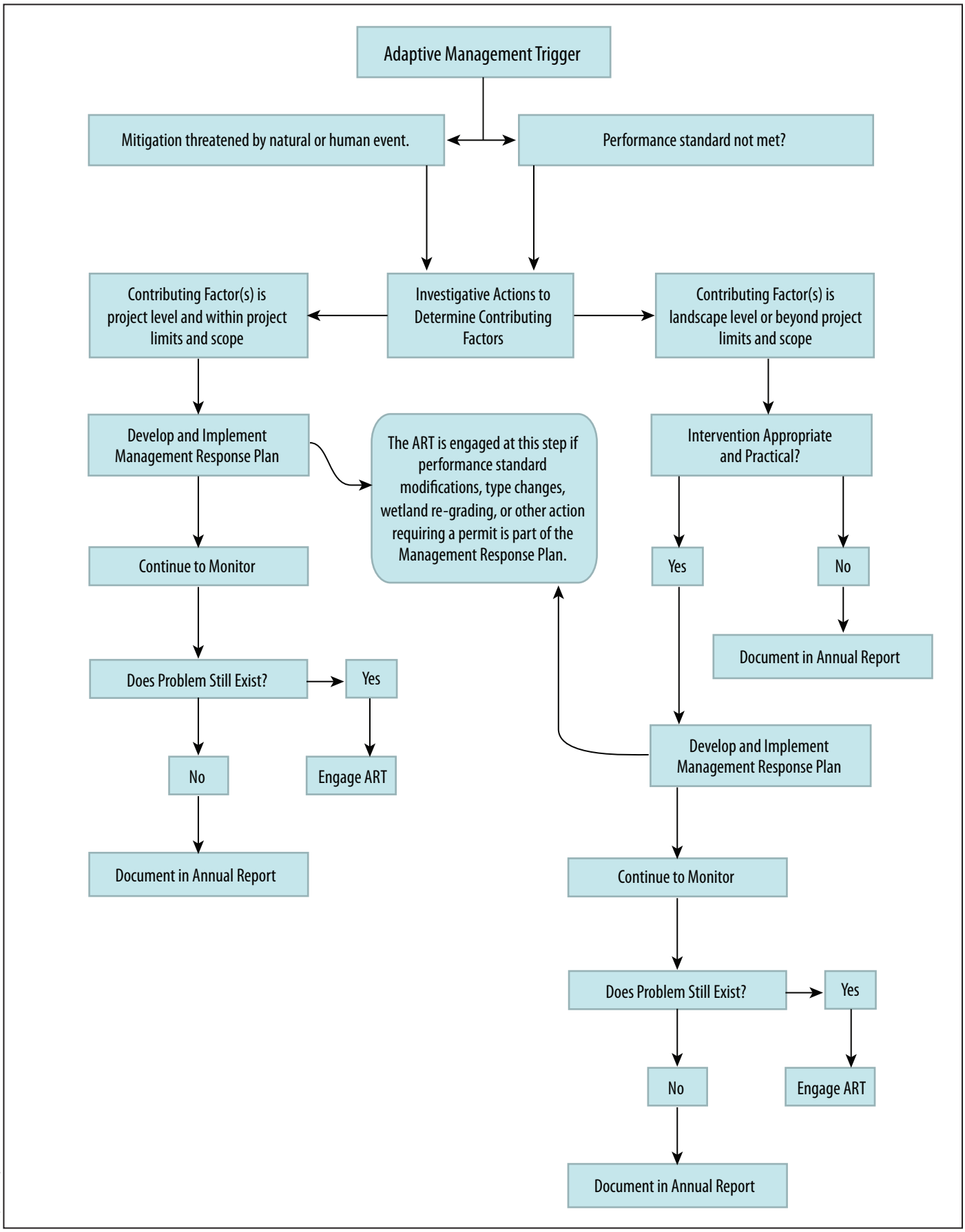


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Figure 12-1
Adaptive Management Flowchart

Table 12-1. Adaptive Management Triggers and Responses

Mitigation Action	Objective	Adaptive Management Trigger	Required Investigative Action	Potential Management Response	Required Reporting
Wet Meadow and Riparian Wetland Reestablishment (temporary impact areas within bypass footprint)					
Grade to original topography Native planting and seeding	Return temporary impact areas to preconstruction conditions or better Control invasive species	One or more of the Primary Metrics are not met for a particular monitoring year Changes in hydrology that may threaten mitigation sites Incompatible adjacent development Fire Other site degradation	Identify and map problem area Determine contributing factors	No action Evaluate appropriateness of performance standards Remove invasive species (any herbicide use requires development of an herbicide plan and approval from NCRWQCB) Increase or extend monitoring Modify plant irrigation Consider appropriateness of vegetation community or type changes Increase herbivory protection for woody vegetation Replant Work with neighboring property owners or government agencies to correct problems Install stormwater best management practices Engage Agency Review Team	Document in annual monitoring report

Table 12-1. Continued

Mitigation Action	Objective	Adaptive Management Trigger	Required Investigative Action	Potential Management Response	Required Reporting
North Coast Semaphore Grass Rehabilitation Areas					
Grazing restrictions	Maintain or improve habitat for North Coast semaphore grass Control invasive species and woody understory vegetation to prevent competition with North Coast semaphore grass	One or more of the Primary Metrics are not met for a particular monitoring year Changes in hydrology that may threaten mitigation sites Incompatible adjacent development Fire Other site degradation	Identify and map problem area Determine contributing factors	No action Remove invasive species (any herbicide use requires development of an herbicide plan and approval from NCRWQCB) Increase or extend monitoring Evaluate grazing practices, modify or enforce leases where necessary Trim or remove woody understory Work with neighboring property owners or government agencies to correct problems Install stormwater best management practices Engage Agency Review Team	Document in annual monitoring report
Baker's Meadowfoam Rehabilitation Areas					
Grazing restrictions	Maintain or improve habitat for Baker's meadowfoam Control invasive species to prevent competition with Baker's meadowfoam	One or more of the Primary Metrics are not met for a particular monitoring year Changes in hydrology that may threaten mitigation sites Incompatible adjacent development	Identify and map problem area Determine contributing factors	No action Remove invasive species (any herbicide use requires development of an herbicide plan and approval from NCRWQCB) Increase or extend monitoring	Document in annual monitoring report

Table 12-1. Continued

Mitigation Action	Objective	Adaptive Management Trigger	Required Investigative Action	Potential Management Response	Required Reporting
Baker's meadowfoam rehabilitation areas (cont.)	Continued from page 12-4	Fire Other site degradation	Continued from page 12-4	Evaluate grazing practices, modify or enforce leases where necessary Work with neighboring property owners or government agencies to correct problems Install stormwater best management practices Engage Agency Review Team	Continued from page 12-4
Wetland Establishment					
Grade to create wetland topography	Establish wet meadow wetlands	One or more of the Primary Metrics are not met for a particular monitoring year	Identify and map problem areas	No action	Document in annual monitoring report
Native planting and seeding	Control invasives	Changes in hydrology that may threaten mitigation sites Incompatible adjacent development Fire Other site degradation	Determine contributing factors	Evaluate appropriateness of performance standards Remove invasive species (any herbicide use requires development of an herbicide plan and approval from NCRWQCB) Increase or extend monitoring Modify plant irrigation Regrade to improve wetland hydrology Consider appropriateness of vegetation community or type changes Replant	

Table 12-1. Continued

Mitigation Action	Objective	Adaptive Management Trigger	Required Investigative Action	Potential Management Response	Required Reporting
Wetland Establishment (cont.)	Continued from page 12-5	Continued from page 12-5	Continued from page 12-5	Selectively remove acute sediment deposition attributable to major natural or human-made events Work with neighboring property owners or government agencies to correct problems Install stormwater best management practices Engage Agency Review Team	Continued from page 12-5
Wet Meadow Rehabilitation (grazed and ungrazed)					
Native planting and seeding Grazing restrictions in select locations Implement grazing management in select locations	Control invasive species Improve wetland condition and maintain wetland ecological diversity Water quality improvements in receiving waters	One or more of the Primary Metrics are not met for a particular monitoring year Changes in hydrology that may threaten mitigation sites Incompatible adjacent development Fire Other site degradation	Identify and map problem Determine contributing factors	No action Evaluate appropriateness of performance standards Remove invasive species (any herbicide use requires development of an herbicide plan and approval from NCRWQCB) Selectively remove acute sediment deposition attributable to major natural or human-made events Increase or extend monitoring Modify plant irrigation	Document in annual monitoring report

Table 12-1. Continued

Mitigation Action	Objective	Adaptive Management Trigger	Required Investigative Action	Potential Management Response	Required Reporting
Wet Meadow Rehabilitation (grazed and ungrazed) (cont.)	Continued from page 12-6	Continued from page 12-6	Continued from page 12-6	Consider appropriateness of vegetation community or type changes Evaluate grazing practices, modify or enforce leases where necessary Replant Work with neighboring property owners or government agencies to correct problems Install stormwater best management practices Increase herbivory protection Engage Agency Review Team	Continued from page 12-6
Other Waters Rehabilitation and Riparian Establishment					
Grazing restrictions	Improve riparian habitat condition and diversity	One or more of the Primary Metrics are not met for a particular monitoring year	Identify and map problem area	No action	Document in annual monitoring report
Implement bank erosion measures	Improve stream stability	Changes in hydrology that may threaten mitigation sites	Determine contributing factors	Evaluate appropriateness of performance standards	
Native planting and seeding	Water quality improvement	Incompatible adjacent development		Remove invasive species (any herbicide use requires development of an herbicide plan and approval from NCRWQCB)	
Control invasives		Fire Other site degradation		Increase or extend monitoring Modify plant irrigation	

Table 12-1. Continued

Mitigation Action	Objective	Adaptive Management Trigger	Required Investigative Action	Potential Management Response	Required Reporting
Other Waters Rehabilitation and Riparian Establishment (cont.)	Continued from page 12-7	Continued from page 12-7	Continued from page 12-7	Consider appropriateness of vegetation community or type changes Modify livestock exclusions, stream crossings, or other management practices Consider flash grazing in riparian corridors (during long-term management only and with agency coordination) Replant Modify or restore erosion repair sites Selectively remove acute (or chronic in the case of streambeds) sediment deposition Increase herbivory protection Remove log jams or other debris Attempt to work with neighboring property owners or government agencies to correct problems up- or downstream of mitigation property Install stormwater best management practices Engage Agency Review Team	Continued from page 12-7

12.1.1 Adaptive Management Trigger

If one or more of the performance standards are not met for any of the mitigation sites, the adaptive management process is triggered. It also is triggered if the health or security of a mitigation site is threatened by natural or human events. Once the Land Manager is aware adaptive management is necessary, the next step is to carry out the investigative actions described below.

12.1.2 Investigative Actions

The Land Manager is required to identify and map the problem areas and perform the necessary investigation to determine the likely contributing factors. Based on the contributing factors, the Land Manager will determine what, if any, response is necessary.

12.1.3 Management Response

Management responses are the Land Manager's attempt to rectify the problem identified during the investigative action process. Management responses can range from multiple, complex actions occurring simultaneously to no action at all. They may be physical in nature, such as re-grading or re-planting a site, or more managerial, such as consulting with neighboring land owners or the ART. The type and intensity of the management response will be dictated by the contributing factors. If failure to meet performance standards is the trigger, how many and which metrics are failures also will play a role in determining the management response. Each situation will be unique and may require a different approach. Table 12-1 lists the potential management responses that could take place depending on the mitigation type in need of attention. This list is not an exhaustive list, nor is it a required list. The Land Manager retains the flexibility to craft whatever response, or host of responses, is needed for each individual situation. Some responses listed in Table 12-1 are self-explanatory, and some need more explanation and are described below.

12.1.3.1 No Action

In most cases when problems arise at a mitigation site, the appropriate response requires a physical or managerial action. However, there are certain cases when no action is an acceptable response to the situation at hand. A no action response still requires the Land Manager to have conducted the investigative actions necessary to make an educated decision that no action is appropriate at that time. A no action response also will be documented in the annual report, the same as any physical or managerial action would be.

Action is not required if only one primary metric is failing to meet the performance standard, with the following exceptions.

- Invasive species is the failing metric. Action is always required when invasive species are exceeding the performance standard threshold.
- BM or NCSG is the mitigation type where the metric is failing. If the contributing factors indicate that the problem is project-level, as opposed to landscape level, action is required. If it is landscape level or beyond the mitigation project limits or scope, the need for action will be determined on a case-by-case basis (Figure 12-1).

There may be other occasions when no action is appropriate, depending on the contributing factors. In all cases where no action is the appropriate response, the Land Manager will justify that decision in the annual monitoring report.

12.1.3.2 Evaluate Performance Standards

Performance standards based on the best information available at the time they were developed can prove to be unrealistic and unsuitable in hindsight. In situations where the relevance of performance standards is in question, the Land Manager can reevaluate the standards, in consultation with the regulatory agency/agencies with jurisdiction over the associated mitigation.

12.1.3.3 Type Changes

Anytime a type change is considered part of the management response, the regulatory agency with jurisdiction over the mitigation in question will be consulted prior to recording the type change in the annual report and project files.

12.1.3.4 Engaging the Agency Review Team

The Land Manager always has the option to request consultation with the ART during any step of the adaptive management process should he or she determine it beneficial, for example, when after a thorough investigation, no obvious contributing factor or solution can be found. Consultation with the ART is mandatory if the following activities are part of the management response plan.

- Proposed changes to the performance standards.
- Proposed type changes.
- Wetland establishment re-grading.
- Any action that requires a CWA 401, CDFG 1602, or 2081 permit.

12.2 Conditions That May Warrant Adaptive Management

12.2.1 Changes in Hydrology

Changes in hydrology could be short- or long-term, natural or artificial, and involve reductions or increases in duration and/or volume. The Land Manager will evaluate each circumstance. Where it is reasonable and within the scope of the MMP and the control of the responsible parties involved, hydrologic changes would be addressed with appropriate actions. Some of the foreseeable situations, such as flooding, drought, and water supply issues, are discussed below.

Typically, winter and early spring flooding of varying extent occurs in Little Lake Valley. After large storms, water in the relatively large upper Outlet Creek drainage basin backs up at the narrow and constricting mouth of Outlet Creek in the north end of Little Lake Valley (CH2M Hill 2006). Additional, localized flooding in the valley generally is related to debris and/or erosion problems in the creeks. Flooding was recorded in the Outlet Creek basin during 1907, 1938, 1950, 1955, 1964, 1983, and 1997. The largest recorded flood event in the valley occurred on December 20, 1964, and lasted 84 hours with a total precipitation amount of 18.59 inches (CH2M Hill 2006).

During the establishment period, established mitigation that has been washed away during a flood event or a natural realignment of a watercourse will be replanted if site conditions are favorable. The specific location of the planting will be evaluated to determine whether scouring will be an ongoing problem, in which case another, more sustainable location may be selected. In the case of prolonged flooding, physical actions may not be required, but instead a type change within the natural resource habitat may be recorded. Where flood debris is interfering with the success of a mitigation site, it will be removed, but in cases where it adds to habitat complexity, it will be retained. In situations where flood debris is adding habitat complexity yet causes a neighbor's property to flood or dry up (downstream), or threatens culverts, bridges, or other structures, the debris will be removed. Acute sedimentation from large flood events, such as those described in the paragraph above, will be remediated if it interferes with the perpetual success of the mitigation. However, chronic long-term sedimentation, which is a normal condition of Little Lake Valley, will not be removed, and the mitigation sites will be allowed to adapt in response to that condition.

In situations where it is clear that an action taken by the Land Manager (or a lack of action) in order to comply with the short- or long-term management commitments threatens to flood a neighboring property, immediate action will be taken to prevent such flooding. For example, where flood debris related to mitigation threatens to cause a backup of water and potentially flood a neighboring property or threatens culverts, bridges, or other structures, the debris will be

removed. The Land Manager will take immediate action to protect the interests of the neighboring properties should they be threatened by actions related to Caltrans' mitigation. In emergency situations, human safety and the protection of private property will take priority over compliance with mitigation commitments.

According to the National Integrated Drought Information System (NIDIS), Mendocino County has experienced 106 reported events since 1900 that had negative impacts on agriculture, resulted in fires, and water/energy reduction and that compromised environmental and social conditions associated with drought. Given that drought is a foreseeable factor and is to be expected throughout the establishment period, the following actions will be considered to reduce its detrimental effects.

- During periods of seasonal drought, soil moisture will be checked on a regular basis during the first two to three growing seasons, and planted habitats will be evaluated for drought stress. The watering regime will be scheduled according to plant needs. Irrigation will provide the minimum amount of water necessary to keep the plants healthy while preventing them from becoming dependent on additional water.
- If a prolonged drought continues beyond the establishment period, additional years of supplemental irrigation may be required during the short-term period. Irrigation will not be required once the site has met performance standards and entered long-term management.

The historical natural water supply of Little Lake Valley has been reduced by the development of Willits, agricultural drainage projects, and a number of reservoirs in the surrounding hills. Furthermore, California is experiencing a statewide water crisis, and northern California's water supply is pressured by the demand to supply southern California's water needs. If future private and public projects in and around the valley continue to decrease the natural water supply to the extent that it begins to affect the mitigation, remediation would require the intervention of regulatory agencies and/or other governing bodies. This would be a situation beyond the scope of this mitigation project, and the authority of the Land Manager or Caltrans.

12.2.2 Fire

With the potential for prolonged drought and the lack of grazing or haying on certain mitigation sites (successional development), fire may become a serious issue in some of them. Lowland mitigation areas in Little Lake Valley where grazing will occur are less likely to be threatened by fire because of prolonged saturation periods in the valley and the ease of emergency vehicle access to most of the mitigation sites. Despite wetter conditions and easy access, fire potential on the lowland mitigation areas where grazing will not occur could increase because of thatch accumulation over time. Because of drier conditions, upland and foothill areas where preserved

oak woodlands occur may be more susceptible to fire. Location of the mitigation site, topography, and access to water may present fire suppression challenges in the upland oak woodland areas.

If mitigation areas that have been planted burn during the short-term monitoring period (performance standard period), the site will be evaluated for damage and monitored for regrowth. Based on the time of year of a fire and the extent of damage and plant regeneration, a revegetation and/or reseeding plan may be drafted and implemented. The intent of re-planting would be to reduce the temporal setback during the performance standard monitoring.

If a fire destroys an establishment, rehabilitation, or preservation site (grazed or ungrazed) during the long-term management phase, the site will be evaluated for damage and monitored for re-growth. Based on the time of year of the fire and the extent of damage and plant regeneration, a revegetation and/or reseeding plan for the planted areas may be drafted and implemented. Revegetation or reseeding would be necessary only in cases where the land was not recovering sufficiently to avoid secondary damage, such as severe erosion, that would be detrimental to the watershed.

12.2.3 Extensive Adjacent Development

Extensive development on adjacent properties may alter current hydrologic regimes supporting the mitigation sites, cause site disturbance that encourages growth and spread of invasive plant species, contribute to fragmentation of sensitive plant populations, involve site alterations that increase erosion or sedimentation within the mitigation site, and/or introduce grazing or other activities or features that pollute or create barriers in shared streams or creeks.

In the event that future development or significant land use changes are proposed on adjacent lands, the Land Manager will coordinate with the adjacent landowner, resource agency personnel assigned to that project, local planning department staff, and others to ensure that the mitigation goals for the mitigation parcels are not threatened.

In areas where development of an incompatible use adjacent to mitigation sites cannot be avoided, potential negative impacts would be evaluated and remediation steps planned and implemented. Remediation efforts may include but are not limited to those listed below.

- Implementation of buffer zones within the mitigation site, where feasible, to separate sensitive biological resources on the mitigation site from adjacent development.
- Installation of cattle barriers.
- Installation of stormwater pollution prevention measures.

- Increase in mowing and weeding schedules.
- Increase in irrigation or water storage capacity during plant establishment period.

12.2.4 Other Site Degradation

Other site degradation may include soil erosion and vandalism. Soil erosion that negatively affects established habitats will be addressed on a case-by-case basis using SWPPP standards. Strategies for dealing with vandalism will include signage, fencing, visual monitoring, and coordination with local law enforcement and other pertinent agencies.

12.2.5 Failure to Meet Performance Standards

All of the conditions previously discussed in this section, and unforeseeable factors not captured in this document, may have an impact on a mitigation site's ability to meet the performance standards. These factors, foreseen or unforeseen, can act at a landscape or microclimate level. In any case, the adaptive management process is the same.

The success of the mitigation sites will be evaluated by measuring various vegetation, hydrology, and/or water quality elements. Each mitigation type has multiple performance standards that measure its success. These multiple performance standards allow a line of evidence approach to determine whether a site is successful. In other words, failing one performance standard does not equate to the automatic failure of the mitigation site for which the performance standard is a measurement. For all mitigation types, with the exception of NCSG and BM, a site is not considered failing until at least two performance standards have not been met. A failing site should not be confused with a site that has triggered the adaptive management process. A site may trigger the adaptive management process for a variety of reasons but still may be considered a successful site. For example, a site that is meeting all its performance standards becomes threatened by localized flooding due to debris on a private property downstream. This would require the Land Manager to initiate adaptive management to prevent the site from becoming flooded. This initiation of adaptive management does not automatically classify the mitigation site as a failure. A failing site will always trigger the adaptive management process but also will require a more intensive response to bring the site up to satisfaction. In cases where performance standards are not progressing according to schedule, but progressive improvement is evident, the appropriate adaptive management action could be an extension of the proposed monitoring period.

Because of the limited locations to mitigate in the valley, it is not practical to abandon a site and relocate the mitigation should a site fail to meet performance standards. Instead, the sites will be reevaluated using the adaptive management process, and every remedial step within the control

and ability of the Land Manager will be taken to correct the situation. All remedial steps, regardless of level of complexity or intensity, will be documented and included in the annual monitoring reports. If all remedial steps within the control and ability of the Land Manager have been applied for 3 or more years without positive results, a reevaluation of the entire MMP may be needed (Section 12.3).

12.2.5.1 HYDROLOGY (HYDROPERIOD)

Hydroperiod will be evaluated as part of the performance standard and success criteria for the following mitigation types: (1) reestablished or established wetland sites and (2) rehabilitated wetland sites. Should any of the sites not meet performance standards, the Land Manager will take the following investigatory steps during the adaptive management process.

- Review current climate conditions to determine whether the failure could be due to drought or flood year(s). If it is determined that climate is a factor, monitoring may need to increase until the conditions normalize.
- Review current grazing practices and the grazing management plan to determine whether the grazing leases are being followed or the plan needs to be modified. If necessary, grazing leases will be enforced or renegotiated, and/or the grazing plan could be modified.
- Evaluate the grading to determine whether establishment sites need to be re-graded to intercept the water table or allow more surface flow interaction.
- Evaluate whether actions on neighboring properties or factors up- or downstream may be interfering with natural water supplies.
- Review success criteria to determine whether they are appropriate for the site in question.

This list of factors is not meant to be exhaustive. There may be other factors that the Land Manager needs to investigate to understand the entire situation before recommending remedial actions. If remedial actions are necessary, the monitoring schedule could be temporarily increased or lengthened in order to document the success of the remediation.

12.2.5.2 VEGETATION

Vegetation will be evaluated as part of the performance standard and success criteria for the following mitigation types: (1) reestablished or established wetland sites; (2) rehabilitated wetland sites; (3) reestablished and established riparian (stream and riverine); (4) established oak woodland; and (5) rehabilitated riparian and other waters (stream and riverine). Should any of the sites not meet performance standards, the Land Manager will take the following investigatory steps during the adaptive management process.

- Evaluate hydroperiod to determine whether an absence or overabundance of water is inhibiting plant growth. If lack of water due to drought is the issue, the irrigation schedule may need to be increased or extended until climate conditions normalize. The irrigation systems and watering methods will be evaluated for serviceability and suitability. An overabundance of water caused by temporary, localized flooding (wet year) could necessitate increased monitoring and replanting. Obstructions up- or downstream or actions on neighboring properties could require debris removal or educational discussions with neighbors to alleviate the problems. Natural landscape changes may not require remedial action. In establishment sites, re-grading might be necessary to intercept the water table or allow more surface flow impoundment.
- Review current grazing practices and reevaluate the grazing management plan to determine whether the grazing leases are being followed or the plan needs to be modified. If necessary, grazing leases will be enforced or renegotiated, and/or the grazing plan will be modified.
- Evaluate mortality areas for herbivory. Remediation for herbivory could include installing additional exclusionary devises such as plant protection cages or fencing. Replanting during the performance monitoring period may be necessary, depending on the extent of mortality.
- Evaluate site for invasive species infestations. Mechanical, chemical, or biological measures or prescribed burns may be necessary to control or eradicate an infestation. Any herbicide use must first be approved by the NCRWQCB.
- Review performance standards to determine whether they are appropriate for the site in question.

This list of factors is not meant to be exhaustive. There could be other factors the Land Manager could investigate to understand the entire situation before recommending remedial actions. If remedial actions are necessary, the monitoring schedule should be temporarily increased or lengthened in order to document the success of the remediation.

12.2.6 Invasive Species

Invasive species will be evaluated as part of the performance standard for the following mitigation types: (1) reestablished or established wetland sites; (2) rehabilitated wetland sites; (3) BM; and (4) NCSG. Should any of the sites not meet performance standards; the Land Manager will take the following investigatory steps during the adaptive management process.

- Review current grazing practices and reevaluate the grazing management plan to determine whether the grazing leases are being followed or the plan needs to be modified. If necessary, grazing leases will be enforced or renegotiated, and/or the grazing plan will be modified.

- Evaluate previous and current routine management practices to ensure that the practices are not substantially increasing the opportunities to introduce new invasive species to the mitigation sites.
- Note practices on neighboring properties that increase the spread of invasive species. These scenarios may require educational discussions with landowners.
- Assess landscape-level changes that create bare soil (flood or wildfire) and allow invasive species to become established in an area.

Mechanical, chemical, or biological measures or prescribed burns may be necessary to control or eradicate an infestation. Any herbicide use must first be approved by the NCRWQCB. The list of factors is not meant to be exhaustive. There may be other factors that the Land Manager may need to investigate to understand the entire situation before recommending remedial actions. If remedial actions are necessary, the monitoring schedule will be temporarily increased or lengthened in order to document the success of the remediation.

Riparian areas, which are normally excluded from cattle grazing, may be considered for flash grazing during the long-term management phase. Agency coordination is required. The NCRWQCB expects the Land Manager to provide a specific proposal for their review and approval prior to grazing in the riparian corridors.

12.2.7 Water Quality and Bioassessment

Water quality and bioassessment constituents will be evaluated as part of the mitigation monitoring effort. Should the water quality and bioassessment constituents not meet performance standards, the Land Manager will take the following investigatory steps during the adaptive management process.

- Review current grazing practices and the grazing management plan to determine whether the grazing leases are being followed or the plan needs to be modified. If necessary, grazing leases should be enforced or renegotiated, and/or the grazing plan should be modified.
- Inspect erosion sites identified in the erosion assessment (Appendix N) to determine whether they are causing increased sediment. If they are the cause, remedial actions will be taken to arrest the problem.
- Consider landscape-level factors such as fires, floods, or disease that result in large patches of bare ground. This situation could have a direct impact on stream water quality. In cases of disease outbreaks that affect vegetation, working with local experts and agriculture extension

may be an option for determining the best solution. Regardless of cause, vegetation losses will be addressed with hydroseeding or replanting.

This list of factors is not meant to be exhaustive. There may be other factors that the Land Manager should investigate to understand the entire situation before recommending remedial actions. If remedial actions are necessary, the monitoring schedule may be temporarily increased or lengthened in order to document the success of the remediation.

12.3 Reevaluation of the Mitigation and Monitoring Proposal

The MMP may need to be comprehensively reevaluated if, overall, the mitigation is not able to meet performance standards despite repeated adjustments and remediation. The need for reevaluation would require all of the following scenarios to occur.

- Two or more mitigation types are failing (i.e., two or more primary metrics are not meeting performance standard thresholds for at least two different mitigation types).
- Management responses, after having been applied for 3 or more years, have been ineffective at improving the conditions on the problem sites. The failing primary metrics are not progressing toward meeting the performance standards. A site would not contribute to the need for reevaluation if performance standards are not progressing according to schedule, but progressive improvement is evident.
- There is no observed positive trend in the secondary metrics for the sites in question.

12.4 Design Changes

Design changes during construction may be made in conjunction with Caltrans and the stakeholder resource agencies in the event that additional scientific information becomes available or proposed management alternatives are seen to be superior during implementation of the MMP.

12.5 Revisions to Maintenance Requirements

During the course of the mitigation program, certain site conditions may change, and some maintenance requirements stated in the MMP may be insufficient or have a negative effect on the intent of the mitigation efforts. If this occurs in the opinion of the Land Manager, the Land Manager will notify Caltrans, identify the detrimental condition(s), and document and suggest

alternative action(s) to remedy the situation. Actions contrary to the requirements of the MMP will be undertaken only with the permission of Caltrans and the stakeholder resource agencies.

12.6 Revisions to Monitoring Requirements

During the course of the mitigation program, certain monitoring procedures in the MMP may become insufficient or redundant. If this occurs in the opinion of the Land Manager, the Land Manager will notify Caltrans, identify the deficient practices, and suggest and document alternative actions in the monitoring reports to remedy the situation. Actions contrary to the requirements of the MMP will be undertaken only with the permission of Caltrans and the stakeholder resource agencies.

12.7 Funding

The MCRCD will only be able to manage to the funds available. Adaptive management actions will be limited to what can be funded in a given year, without drawing on the endowment principle or preventing basic tasks that would comply with laws, protect public safety, or prevent degradation of the overall mitigation project. Chapter 13 discusses financial assurances in detail. Appendix R provides an itemized breakdown of short and long-term funds.

12.8 Responsible Parties

Caltrans will be responsible for adaptive management at the mitigation sites during the construction phase of the mitigation project. MCRCD will be the responsible party for adaptive management once Land Manager responsibilities have been transferred from Caltrans.

Chapter 13 Financial Assurances

Caltrans acknowledges its obligation to comply with the financial assurances requirements of the California Fish and Game Code 1602 Streambed Alteration Agreement and 2081 Incidental Take Permit, and the NCRWQCB's CWA 401 Certification. Caltrans includes with this MMP documents supporting the establishment of a non-wasting endowment for ensuring that mitigation measures are adequately funded in perpetuity. These documents include calculations and assumptions based on a systematic and thorough process to account for the costs of foreseeable long-term mitigation and maintenance activities and, additionally, a contingency factor to cover unforeseen circumstances.

Mitigation costs set forth below have been calculated for actions related to the aforementioned permits. In addition, the project will be required to comply with the USACE CWA 404 individual permit.

The compensatory mitigation proposed in this document is considered part of the scope of the project, and as such will be funded with the same level of obligation as the roadway construction. Funding for the construction, short- and long-term monitoring, management, and maintenance of the mitigation described in this document will originate from the project. Mitigation funding is held in the Willits Bypass Expenditure Authorization (EA) 26200 and earmarked as mitigation dollars. Although it is being managed as a separate project, a portion of the Ryan Creek Fish Passage Project will be funded as compensatory mitigation for impacts on fisheries and waters of the State resulting from the bypass project; a separate project and EA have been established for the Ryan Creek Fish Passage Project work, and money will be transferred from the Willits Bypass EA into the new Ryan Creek Fish Passage Project EA. This money then will be available to cover the full cost of the design as well as to contribute toward the construction costs of the Ryan Creek Fish Passage Project.

The project is programmed in the State Transportation Improvement Program in fiscal year 2009/2010. The project has been granted a 20-month extension by the California Transportation Commission. The extension began July 1, 2010, and concluded in February 2012.

The estimated cost for all mitigation is $56,935,188. This estimated cost includes land acquisition, mitigation construction (including the Ryan Creek Fish Passage Project), short- and long-term monitoring, management, and maintenance and reporting. The breakdown of the total cost of mitigation is as follows:

- Land acquisition = $16,000,000.

- Construction costs (minus Ryan Creek) = $17,850,000.
- Ryan Creek Fish Passage Project = $3,000,000.
- Initial and capital task (short-term endowment) = $10, 468,755.
- Ongoing tasks (long-term endowment) = $9,616,433.

Current endowment funding for initial and long-term costs associated with offsite mitigation was calculated using a combination of the PAR program—a tool developed by the Center for Natural Lands Management—and a customized Excel spreadsheet. The PAR is a computerized database method that is extremely effective in helping land managers calculate the costs of land management for a specific project. The PAR helps analyze the characteristics and needs of the property from which management requirements are derived. It helps pinpoint management tasks and estimates their costs as well as the necessary administrative costs to provide the full cost of managing any property. The PAR generates a concise report that serves as a well-substantiated basis for long-term funding, including endowments, special district fees, and other sources. The PAR was used to help develop the list of necessary tasks, resources, equipment, and unit costs. Unit costs were adjusted if research or experience indicated that a particular PAR unit cost estimate was not suitable for project-specific circumstances. The Excel spreadsheet was used to reorganize, calculate, and track the tasks and costs in more intuitive, reader-friendly style and can be found in Appendix R.

Caltrans employed the PAR default rate for contingencies at 10%, and a more conservative reinvestment rate of 4% (vs. the PAR default of 5%), and an administration rate of 33%.

The endowments will be held and managed by CDFG.

Chapter 14 References

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