

## **WATSONVILLE SLOUGH - LAST MILE**

### **VEGETATION MANAGEMENT AND ENHANCEMENT PLAN**

#### **INTRODUCTION TO MANAGEMENT AND ENHANCEMENT PLAN**

The Watsonville Slough – Last Mile Vegetation Management and Enhancement Plan identifies actions to protect and enhance native dune and wetland plant communities along the lower portion of Watsonville Slough.

The last mile of Watsonville Slough is part of Santa Cruz County’s south county slough system. Drainage from the upper watershed, as well as local runoff, supports a series of five freshwater sloughs in this portion of the county. These sloughs are dominated by freshwater marsh vegetation, which are intermingled with willow riparian woodland, upland grassland, and near the coast, coastal dune scrub. The Watsonville Slough system is recognized as the largest and most significant wetland habitat between Pescadero Marsh (San Mateo County) and Elkhorn Slough (Monterey County). The natural resources of this low-lying region have changed dramatically since pre-Spanish and pre-European colonization. Agricultural activities, including peat farming, public facilities (i.e., roadways) and residential development have significantly altered the historic (pre-European) distribution of both the brackish and freshwater marshes within the lower watershed. This has occurred through the direct alteration of habitat (i.e., conversion of historic vegetation type to other land uses) and through indirect means (i.e., relocation, filling or other alterations of natural drainage features). In most instances, the upland areas that historically supported grasslands and coast live oak woodland have become agricultural lands, and more recently, urban lands. Although reduced in size compared to historical conditions, the lower watershed slough system still provides a high level of plant community and species diversity.

Recognizing the natural resource value of the lower slough, the Watsonville Slough – Last Mile Vegetation Management and Enhancement Plan identifies activities that will enhance the wetland and dune scrub habitats along the last mile of Watsonville Slough. The plan identifies vegetation management and enhancement activities that will improve the wetland habitats along the slough and be compatible with adjacent land uses.

All of the enhancement activities identified in the Plan are voluntary and subject to landowner interest, volunteer participation and potential funding.

## GOALS OF THE PLAN

The Vegetation Management and Enhancement Plan identifies activities to restore and enhance previously disturbed or significantly degraded portions of the slough wetlands and adjacent upland areas. Successful implementation of the plan will increase both wetland and upland habitat values within the lower slough ecosystem.

Specific enhancement plan goals include:

1. Avoid impacts to existing wetland and dune scrub resources during enhancement activities, through sensitive site activities (e.g., use of hand labor, volunteer education).
2. Enhance the slough wetlands through the removal of non-native plant species and, where necessary, planting of native wetland plants.
3. Enhance the dune scrub habitats along the slough through the removal of non-native plant species and, where necessary, planting of native dune scrub plants.
4. Hand-seed or install container stock plants in bare areas to reduce soil erosion.
5. Provide regularly scheduled maintenance of enhanced areas to ensure success of the management actions (i.e., periodic removal of invasive non-native plant species and temporary irrigation for new plantings).
6. Utilize plant materials native to the Watsonville Slough watershed.

## CONCEPTUAL SCHEDULE

**Typical Revegetation Schedule, Years 0 through 3**

Task	Year 0 2004				Year 1 2005				Year 2 2006				Year 3 2007				
	W	S	S	F	W	S	S	F	W	S	S	F	W	S	S	F	
Collection and Propagation of Wetland and Dune Scrub Propagules																	
Removal of Invasive, Non-Native Plant Species																	
Planting of Wetland and Dune Scrub Plant Species																	
Establishment Period Maintenance and Monitoring																	
Monitoring of Success																	

## **GENERAL INFORMATION NOTES**

1. Prior to plant material installation, planting locations shall be coordinated with layout of underground utilities, if any. The work parties shall be familiar with the locations of existing and future underground services and improvements that may conflict with the work to be done. The work parties are responsible for verifying all locations of underground utilities prior to the start of work.
2. The work parties shall be responsible for maintaining the site in a safe and clean condition. At the end of each workday, the site shall be cleaned up and left in a safe condition.

## **REVEGETATION ACTIVITIES**

1. The following revegetation items are identified in the Vegetation Management and Enhancement Plan:
  - a. Installation of container stock plantings.
  - b. Hand seeding of native plant seeds.
  - c. If desired, installation of a temporary irrigation system, functional for up to five years. Irrigation system to be designed and installed by others.
2. The locations of revegetation elements are for planning purposes only and may be adjusted in the field at the direction of the project's restoration specialist prior to installation. The work parties shall take care to locate plant materials to provide optimum growth conditions. Plant material shall not be installed to obstruct drainage patterns or harm existing plant material. The work parties shall notify the project's restoration specialist should conflicts occur.
3. Prior to site work for the installation of the container stock, the work parties shall layout plant materials, while still in containers or as flagged locations in the field.
4. The work parties shall be responsible for supplying plants of the species and size specified and delivery of the plant material to the site.
5. The work parties shall ensure that all plants are true to name, with one plant in each bundle or lot tagged with the botanical name and plant size, in accordance to the standards of practice recommended by the American Association of Nurserymen.
6. All plants shall be the genus and species outlined in the plan. Size of material may be varied depending upon availability and growing source. Under no condition, will there be any installation of non-native container plants within the enhancement areas.
7. Existing vegetation that is not within the limits of the project area shall not be cut, removed or otherwise disturbed, except for occurrences of invasive, non-native plant species as addressed in the Invasive, Non-native Plant Removal Activities section.
8. Planting of container stock shall occur after rain has moistened the ground to a minimum depth of 8 inches and more rain is forecast (typically November through January).
9. Container stock plants shall be installed by excavating a planting hole large enough to receive the rootball. The hole shall be backfilled with native soil, the plant installed and soil tamped. Plantings shall be watered in such that the root crown is even with the surrounding grade. A 3-inch high hand-packed soil berm shall be constructed around the plant to create a watering basin. If soil is not moist to 14 inches from natural rainfall, the plant shall be hand watered immediately following installation.

## SEEDING NOTES

1. Open sandy areas can be hand-seeded to create dune scrub.
2. Seeding should be installed prior to October 15, such that natural rainfall patterns are used to initiate germination.
3. All areas shall be broadcast seeded with native seeds; the exact application rate will depend upon seed availability, however, a seed mixture with an application rate of approximately 20 lbs/acre is recommended
4. Dune scrub seeds should be lightly hand-raked into the soil to an approximate depth of 0.5 inch. The seeded area should not be mulched, however, open weave jute netting can be applied over the seeded areas on steep slopes.

## INVASIVE, NON-NATIVE PLANT REMOVAL ACTIVITIES

1. The enhancement area supports occurrences of invasive, non-native plant species that should be removed and/or controlled to meet the project goal of habitat enhancement. The removal work will include hand removal and selective application of an approved herbicide.
2. The following invasive, non-native plant species have been documented from the enhancement area and management actions are identified in this plan:
  - a. Iceplant (*Carpobrotus* spp.)
  - b. Poison hemlock (*Conium maculatum*)
  - c. Pampas grass (*Cortaderia jubata*)
  - d. Wild Radish (*Raphanus sativa*)
  - e. Wild Mustard (*Brassica* sp.)
  - f. Myoporum (*Myoporum* sp.)
3. Actions are identified to remove and control the occurrence of the invasive, non-native plant species from the management and enhancement area. In general, individuals of species identified in item 2, above, should be removed by hand hoeing and hand pulling, with all plant materials bagged and removed from the site. Hand hoeing of herbaceous plants should sever the root approximately 4 inches below the ground surface. Hand pulling should remove the root of the plant. Site maintenance visits should be conducted in spring (March through May) and summer (June through August) to remove any occurrences. The goal of the maintenance actions will be to remove all invasive plant species from the management and enhancement area prior to their development of flowering heads and/or creating significant infestations within the revegetation areas. Specific actions for species include:
  - a. ***Iceplant.*** Iceplant occurs within the wetland and in drier areas adjacent to the slough. Iceplant is a species that requires control and removal due to its aggressive growth pattern and its ability to out compete with native wetland and dune scrub plant species. The shallow, fibrous roots are produced at every node that is in contact with the ground, so it is important to remove all live plant materials from the site. Manual removal should include hand pulling and removal of the material. Piles of removed material can be used as temporary mulch, but the area must be checked for re-sprouts. Treatment can also include herbicide application. Glyphosate, applied at 2 percent or higher, with addition of 1 percent surfactant, is also effective. Using acidic water in the application increases effectiveness. It takes several weeks for the plants to die and re-sprouting can occur from

- apparently dead individuals for several months afterwards. Spraying in early or mid winter can reduce impacts to native plants that may be growing adjacent to the iceplant.
- b. **Poison Hemlock.** Poison hemlock is a non-native biennial species, with a long taproot. This plant species is fast growing and rapidly colonizes disturbed soils. Due to the invasive and aggressive growth of the poison hemlock, it is necessary to control this species to ensure successful enhancement and/or revegetation of the dune scrub and wetland areas. Control measures recommended include seasonal mowing, hoeing and/or hand pulling. If the plant is hoed, the plant should be removed a minimum of 2” below the ground surface, before flowering. All plant parts contain poisonous alkaloids; workers should wear gloves when handling the plant.
  - c. **Wild Radish and Wild Mustard.** Wild radish and wild mustards are non-native biennial species. Both radish and mustards are fast growing and rapidly colonize disturbed soils. Control measures recommended include seasonal mowing, hoeing and/or hand pulling. If the plant is hoed, the plant should be removed a minimum of 2” below the ground surface, before flowering. If mature or nearly mature seed heads are present, remove the plants from the site.
  - d. **Pampas Grass.** The management and enhancement area contains only a few scattered occurrences of pampas grass. These individuals should be removed by cutting the stalks low to the ground, then hand digging out the root crown.
  - e. **Myoporum.** The management and enhancement area contains only a few occurrences of this shrub/small tree that are recommended for removal. These individuals occur in the wetland habitat should be removed by cutting the trunks and removing the root mass.

## SITE MAINTENANCE

1. Maintenance work should include all necessary actions to keep newly installed plants in a healthy, growing condition. In general, native plants will not require pruning.
2. Maintenance activities should include periodic removal of invasive, non-native plant species. See techniques for removal in Invasive, Non-Native Plant Removal Activities.
3. If an unusual drought occurs after plantings (i.e., less than 70 percent of normal rainfall between October and May), such that soil moisture drops to a level where plant survival is compromised, supplemental irrigation should be initiated for new plantings. Supplemental irrigation shall be continued until natural rainfall levels replenish soil moisture.

