

EXECUTIVE SUMMARY

BACKGROUND AND INTRODUCTION

The environs of the Watsonville Sloughs are a highly valued and unique wetland resource situated adjacent to Monterey Bay within the California central coast. Six individual sloughs (Watsonville, Harkins, Struve, West Branch Struve, Gallighan, and Hanson) sustain large wetland marsh and riparian habitats for a variety of wildlife and native plants. The adjoining hillsides and upland areas contain important wildlife areas including grassland, oak woodland and chaparral habitats. Economically important agricultural production occurs throughout much of the Watsonville Sloughs Watershed.

The Sloughs have a rich history of natural resource utilization beginning with the original hunter/gatherer Native American societies. Substantial changes occurred after European settlement began in the early 1800s with widespread clearing of native vegetation and reclamation of wetlands for agriculture. This led to hydrologic changes detrimental to native plants and wildlife habitat, culminating in large losses of wetlands and native habitats during land reclamation efforts in the late 1800s and early 1900s. A marked decline in open space and habitat accelerated after World War II with an expansion of urban areas around the City of Watsonville. All of these changes fragmented the Sloughs, reduced water circulation and groundwater recharge, and introduced a number of pollutants to the waterways and remaining natural wetlands. As a result, the Watsonville Sloughs system has been listed as an impaired waterbody under the Federal Clean Water Act (Section 303d) for elevated levels of pesticides, sediment, oils and grease, metals and pathogens.

In recent years, as the drainage system constructed during the reclamation era has decayed, large areas of agricultural land have been seasonally inundated resulting in a significant loss of agricultural production. This process has been further accelerated with the accompaniment of a trend of land subsidence over large areas and urban expansion upstream adding more runoff to further tax the drainage system. Although a greater area of inundation can be viewed by some as favorable to the overall wetlands value of the Sloughs, (particularly with expanded open water habitat for winter migratory waterfowl and wetland vegetation), it has been coupled with reduced water circulation, eutrophication, and a reduction in the general biotic health of the aquatic ecosystem. In their current condition, and despite the reversion to wetlands, the natural resources of the Sloughs exist well below their potential value. Simultaneously, agricultural productivity has been adversely affected by the

same conditions. Thus, there is an opportunity to improve the natural resources of the Sloughs, while addressing the economic needs for agricultural productivity and the effects of urban expansion.

The Watsonville Sloughs Watershed Conservation and Enhancement Plan (WSCEP) specifies feasible measures that address the long-term protection and enhancement of the Watsonville Sloughs system's ecological values, and the needs of agriculture and other land uses. The WSCEP is designed to provide a future vision and a guide for many agencies, organizations and individual landowners. It is anticipated that the various entities will embark on a coordinated effort to implement the Plan and focus on priority areas. The Plan is based upon scientific, social and economic factors that have often worked at odds, but must be realigned if successful preservation and enhancement of the landscape and rural character of the Sloughs is to be realized. Most of the resource management activity now occurs in the regulatory sector, leading to a fragmented and often contentious relationship between stewardship organizations seeking resource protection and landowners. A key aim of the Plan is to find resource solutions that foster cooperation between various groups, agencies and landowners. The Plan is designed to be adaptable and flexible should important factors change in the future. Participation is on a strictly voluntary basis.

The WSCEP was prepared by a Consultant Team headed by Swanson Hydrology and Geomorphology (SH&G) under contract to the County of Santa Cruz with funding provided by the California State Coastal Conservancy and U. S. Environmental Protection Agency. The WSCEP was developed working collaboratively with numerous agencies, public interest groups and individuals with a stake in the management and protection of the Sloughs under the direction of a Steering Committee, representative of the stakeholders in the watershed.

The community and the Steering Committee identified the following goals, which are the desired outcomes of implementing the WSCEP:

- Protect and where possible restore degraded characteristics of marsh, riparian and upland habitats;
- Provide connected corridors among similar habitats as well as continuity among habitats that naturally occur in association;
- Implement projects that benefit natural resource quality while addressing social and economic needs of the community and landowners;

- Work with landowners and operators to develop mutually beneficial projects to be implemented only where the landowner is willing;
- Improve drainage and water quality in a manner that improves conditions for landowners, wildlife and water users;
- Address the needs and responsibilities of landowners in the watershed with regard to management of sensitive species;
- Look for opportunities to minimize regulatory disincentives for resource protection and enhancement on private lands;
- Establish a system whereby opportunities to acquire land can be acted upon as they arise;
- Develop public education and access improvements to enable a greater public awareness of the values of the Watsonville Sloughs for native wildlife and natural resources as well as their economic, social and recreational values.

To organize discussions of specific locations in the Watsonville Sloughs Watershed, geographic factors were used to distinguish ten specific Planning Areas, each with unique natural resource features and planning issues. In general, land use in the upper watershed is rural residential (Larkin Valley and Upper Gallighan Slough) with minor commercial agricultural land uses. The Upper Struve and Upper Watsonville Sloughs sub-watersheds are predominately urban landscapes surrounding wetlands and intervening open spaces on hillslopes; many dense commercial and industrial uses bound the Sloughs, especially along Watsonville Slough below Ford Street. The open space hilltops and upper hillslopes between Struve Slough and Watsonville Slough east of Highway 1 will become more urbanized with the completion of new housing developments within the next five years. The middle portions of Gallighan and Harkins Sloughs are highly disturbed by farms on hillslopes (fallow or under production), or other intensive uses such as landfills and transportation corridors. The lower portions of the tributary sloughs (Harkins, Struve, West Branch Struve) are generally in open space (some in public ownership) but in degraded condition (invasive vegetation and constrained hydrology). The lower watershed areas are dominated by agricultural uses on valley floors (i.e. Beach Road and Watsonville Slough below Highway 1), much of which has encroached directly into the Sloughs.

FINDINGS

An assessment of existing conditions found that present and historic land use has had a significant impact on natural resources in the watershed. In general, the impacts are conversion of land once

habitat and open space to agricultural or urban uses; water quality degraded by constrictions to water circulation, contamination from non-point source pollutants (sediments, excessive nutrients, residual DDT and other pesticides in soil from historic use and urban runoff). Vegetation resources have been degraded through land conversion, clearing practices and invasion by exotic species. The degradation of wildlife resources is related to the effects of toxic runoff, depletion of dissolved oxygen in the water column, fragmented habitat, structural barriers to wildlife movement and the presence of aggressive non-native species.

RECOMMENDATIONS

The WSCEP recommends a diverse set of projects consisting of the following five components:

- Habitat enhancement projects, such as hydrologic improvements, replacement of exotic invasive vegetation and water quality improvements;
 - Land acquisition strategies, to allow for the management of areas of open space dedicated to ecosystem process and wildlife habitat;
 - Coordination and improvement of regulatory process and compliance, to provide the means for landowners to have site specific requirements of sensitive resources built into the design of reliable drainage systems;
 - Support and coordination with other ongoing conservation programs within the watershed to ensure communication among stewardship organizations and resource agencies, thereby fostering implementation of enhancement projects; and
 - Public access and education to foster further awareness of the important natural resources of the Watsonville Sloughs system.
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- Implementation of projects will only occur where there are willing landowners and will require acquisition of all applicable agency approvals.

When implemented, the recommended projects will help relieve environmental stressors; buffer wetlands and sensitive areas from land use impacts, and help restore a functional ecosystem within the Sloughs, while maintaining a viable agricultural industry.

The following are descriptions of the enhancement recommendations for each of the ten geographic planning areas in the Watsonville Sloughs Watershed.

WATSONVILLE SLOUGH

Upper Watsonville Slough

The Upper Watsonville Slough Planning Area is mostly contained within the City of Watsonville's jurisdiction and extends from its headwaters above Main Street to the low gradient drainage ditch/channel at Highway 1. The majority of the land within this Planning Area between Ford Street and Highway 1 is currently unincorporated, but area is under consideration for incorporation into the City for development with a component of expanding wetlands along the Slough.

The recommendations for the Upper Watsonville Slough Planning Area include the following projects:

- Restoration of 45 acres of wetlands formerly filled with construction debris during the 1930's. This publicly owned site is east of Ramsey Park extending from Main Street to Manabe Drive)
- Construction of a trail system through City owned parcels from Ramsey Park to Errington Road. The project will address hillslope drainage problems and include installation of urban stormwater treatments and revegetation with native plants.
- Restoration of urban wetland vegetation and hydrology from Freedom Blvd to Main Street including buffers and stormwater treatment measures.
- Restoration of 30 acres of historic wetland downstream of the westerly end of Ford Street in the event of annexation by the City of Watsonville.

Middle Watsonville Slough

The land use surrounding Middle Watsonville is predominantly agricultural lands, with a small industrial development on Lee Road. The reach of Watsonville Slough between Highway 1 and Shell Road flows through a straight ditch in the flat, northern edge of the Pajaro River floodplain. In addition to receiving agricultural runoff from the surrounding fields, Middle Watsonville Slough accepts the urban and industrial runoff from Struve Slough and the agricultural runoff from Hanson Slough.

Recommendations for Middle Watsonville Slough include:

- Reconstruction of the drainage into two separate systems: a natural wetland area and a dedicated agricultural drainage with pre-treatment measures.
- Removal of invasive, exotic vegetation from the marsh plain and adjacent upland area and revegetation with native species.

- Restructure of slough channels to obtain natural variability in pattern and depth (pools and shallows).
- Renovation of the Shell Road pumps to improve efficiency at high water stages and to allow for instantaneous, variable operation allowing water exchange during low flow freshwater periods to create transitional habitat zones.
- Securing funding to continue programs, which provide technical assistance with erosion control and other conservation practices for local landowners.

Lower Watsonville Slough

The Lower Watsonville Slough Planning Area includes the salt marsh estuary and slough channel from Shell Road to the mouth at the confluence of the Pajaro River. It includes the Pajaro Dunes development to the southwest, the agricultural lands to the east and wetland areas around Sunset State Beach.

The recommendations for Lower Watsonville Slough involve:

- Removal of exotic vegetation and revegetation with natives in existing marsh and adjacent transitional and upland areas.
- Partnership with the Friends of Pajaro Dunes and the Pajaro Dunes Homeowners Association to enhance wetland resources.
- Remove reclamation fill, berms and antiquated drainage structure to improve marsh hydrology.
- Repair and recontour the levee along the east side of the slough from Beach Road to the river mouth to enhance native vegetation and re-route agricultural drainage to pre-treatment facilities.

STRUVE SLOUGH

Upper Struve / Upper West Branch Struve Sloughs Above Highway 1

The headwaters of Struve Slough originate just south of the Watsonville Municipal Airport. The drainage area is predominantly dense urban residential and commercial development.

The recommendations for Upper Struve/Upper West Branch Struve Sloughs include:

- Renovation of hydraulic structures to restore hydrology and improve water circulation.

- Construction of trail system on City owned parcels from Pennsylvania Avenue to Highway 1 with installation of urban runoff treatment measures, removal of exotic vegetation from hillslopes and revegetation with native plants.
- Removal of reclamation fills and channels to improve water circulation with installation of ponds and meanders to diversity aquatic habitats.
- Ensure protection of uplands known as “Tar Plant Hill” located northeast of Highway 1

Lower Struve Slough / West Branch Struve Slough

This Planning Area includes the remaining portion of Struve Slough and West Branch Struve Slough downstream of Highway 1 to the confluence with Watsonville Slough just upstream of the UPRR crossing.

Recommendation for Lower Struve Slough / West Branch Struve Sloughs include:

- Restoration of channelized drainage from Lee Road to confluence with Watsonville Slough to a more natural wetland area buffered from a separate drainage system with water quality pre-treatment measures.
- Conduct selective dredging to remove remnants of reclamation activities and improve the Lee Road crossing to improve water circulation and water quality.
- Restore native vegetation cover through the removal of exotics and revegetation with appropriate native species throughout the planning area.
- Encourage the development of a management plan for the 109-acre - California Department of Fish and Game Ecological Preserve.

GALLIGHAN SLOUGH

Gallighan Slough extends from its headwaters at Highway 1 flowing down a narrow valley bounded by steep undeveloped hillslopes of dense riparian forests, then past the County landfill channelized along a main traffic corridor, and drains into Lower Harkins Slough.

The recommendations for Gallighan Slough include:

- Upgrade of the stormwater drainage system along Buena Vista Road from San Andreas Road to Highway 1 to reduce erosion and resultant sediment loading to Gallighan Slough. Requires installation of adequate culverts to pass large floods and stabilization of roadside ditches, road

cuts and road fill areas and pre-treatment facilities to remove sediment before discharge to waterways.

- Restoration of native vegetation in areas of public ownership and negotiation to expand the practice into areas of private ownership.
- Support and expand programs to encourage landowners to reduce erosion and sediment discharge from private lands through education and technical assistance.

HANSON SLOUGH

Hanson Slough drains a small basin situated between lower Harkins and lower Struve Sloughs. Harkins Slough Road traverses the upper watershed area and land use is predominately agriculture and grazing. Hanson Slough flows southward and drains into Watsonville Slough.

The recommendations for Hanson Slough include:

- Improve and expand native vegetation cover to increase abundance and diversity of plant communities and to create sediment-filtering buffers between uplands, swales and waterways.
- Develop a grazing and runoff management plan to improve water quality. The plan would include a manure management plan and grazing methods to eliminate sediment and excess nutrient delivery to the Slough.
- Restore the hydrologic function of Hanson Slough and its tributaries to reduce erosion and improve aquatic habitat and the water quality of runoff leaving the basin.

HARKINS SLOUGH

Upper Harkins Slough (Larkin Valley)

Upper Harkins Slough is the longest waterway in the Watsonville Sloughs system extending 7 miles inland through Larkin Valley. Above Highway 1 Harkins Slough flows as a stream within Larkin Valley, a narrow, linear valley surrounded by moderately steep hillslopes and tributary valleys. A significant amount of this watershed is undeveloped land providing groundwater recharge and types of wildlife habitat, relatively absent in much of the remaining areas of Watsonville Sloughs.

The recommendations for Upper Harkins Slough include:

- Establishment of a management plan to coordinate land use practices for drainage maintenance and management of riparian, wetland and sensitive species habitats. The plan

would coordinate land use activities in the upper watershed such that impacts to vegetation and wildlife resources can be minimized by the timing and methods of maintenance.

- Installation of a pilot drainage and riparian habitat restoration project to demonstrate planning, engineering, enhancement and maintenance techniques that could be applied to waterways.
- Develop a native vegetation enhancement and education program for local landowners and provide ways for grant money to be used on private land to improve native vegetation.
- Develop manure management plans for livestock or animal keeping operations to minimize entrainment of excessive nutrients into waterways and groundwater resources.

Lower Harkins Slough

Lower Harkins Slough extends from Highway 1 to the northern edge of the Pajaro Valley floodplain where it meets Watsonville Slough. The area is mostly fallow agricultural and grazing land with sparse buildings associated with present or past agricultural uses and concentrated public and private residences. Significant areas of the watershed are publicly owned, in conservation easement or not actively cultivated or grazed.

The recommendations for Lower Harkins Slough include:

- Removal of the hydraulic constriction at Harkins Slough Road by removing the road crossing or installation of an open span crossing to improve water circulation.
- Selective dredging of wetland areas to remove reclamation fills and structures and improve aquatic habitat diversity and water circulation.
- Restoration of native plant communities in the wetlands, transitional and upland areas.

BEACH ROAD DITCH

The land use surrounding Beach Road Ditch is exclusively active agricultural cultivation. On the south side of the road, Beach Road Ditch extends the length of Beach Road from Lee Road to its discharge into Lower Watsonville Slough Estuary

The recommendations for the Beach Road Ditch involve:

- Widen existing drainage ditches, plant and encourage vegetative growth within the wetlands beginning in the spring months (especially wetland vegetation capable of uptaking large amount of nutrients). Selective harvest of vegetation prior to winter storms to ensure proper flood capacity during high flows.

- Construction of pre-treatment ponds to improve water quality prior to discharge to the wetland and estuary.

The ultimate vision for the Sloughs is to improve conditions to the point where the natural ecological processes occur over a large enough area to allow them to become self-sustaining. The Sloughs' natural areas would be connected by corridors along slough and stream valleys rather than existing in isolated pockets. The connected areas would include a variety of landscape elements including wetlands on the valley floor and adjacent upland habitats, which serve a diverse assemblage of wildlife as habitat and breeding grounds. Native vegetation in the areas dedicated for natural ecosystem processes would be sustained to the point where it can out-compete exotic invasive species and maximize native wildlife habitat. For natural areas bounded by land use, pollution would be controlled within the land use either by source control to prevent pollution from entering the drainage system in the first place, or through pre-treatment, to remove as much as possible prior to discharge to natural waterways. It is this vision that will eventually lead to the creation of a vibrant and natural system that will help to nurture native plants and wildlife while enhancing the quality of life of all Pajaro Valley residents.