SMA Grant Agreement No. G1400375
Washington State Department of Ecology

Restoration Plan

Shoreline Master Program Update ● City of Long Beach ● May 2015

Final Plan: reflects revisions based on comments from the public and the Washington State Department of Ecology

This is the work product for Task No. 8 of SMA Grant Agreement No. G1400375

Final
Restoration Plan
Long Beach Shoreline Master Program Update

Prepared by:

The City of Long Beach
115 Bolstad West
PO Box 310
Long Beach, Washington 98631

Under supervision of:

The Washington State Department of Ecology
PO Box 47775
Olympia, Washington 98504

Contact:

Gayle Borchard
Director of Community Development
360.642.4421

Contact:

Kim Van Zwalenburg
Senior Regional Shoreline Planner
360.407.6520

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Acronyms & Abbreviations

The first appearance in the text of each of the following acronyms and abbreviations is marked with the ⌖ symbol.

Ecology: Washington State Department of Ecology

MHW or MHT: Mean High Water or Mean High Tide

MRC: (The Pacific County) Marine Resource Council

OHWM: Ordinary high water mark

RCW: Revised Code of Washington

SCL: Seashore Conservation Line

SED: Shoreline Environment Designation

SMA: Washington State Shoreline Management Act

SMP: Shoreline Master Program

SSWS: Shoreline of Statewide Significance

WAC: Washington Administrative Code

WRIA: Water Resource Inventory Area

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Glossary

The first appearance in the text of each of the following words or phrases is marked with the ⌖ symbol.

1889 GOVERNMENT MEANDER LINE: The western limit of privately-owned beach property, the approximate location of mean high tide⌖ (MHT⌖), at the time Washington achieved statehood in 1889. Also termed The 1889 Line or the Western Upland Boundary, or simply the 1889 Line.

DEFLATION PLAIN: The low area between the foredune and old dune ridge, where the foredune blocks the deposition of new sand and wind scours and erodes the surface, often down to the water table.

FOREDUNE: The large, currently developing primary dune, closest to the ocean.

INTERDUNAL WETLAND: Wetlands located in small interdunal depressions to extensive deflation plains⌖ behind stabilized foredunes. Interdunal wetlands are primarily fresh water; they have mineral soil; and they are groundwater dependent with seasonal fluctuations.

MEAN HIGH WATER: The average of all the high water heights observed over a specific 19-year period (currently 1983 through 2001) called the National Tidal Datum Epoch. Also termed Mean High Tide.

MITIGATION SEQUENCING: A step-wise approach to mitigating the impacts of an action, whereby a preferred order is taken, emphasizing avoidance of the impact The preferred order of the mitigation sequence is as follows:

1. Avoid impacts by not taking a certain action or parts of an action;
2. Minimize impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to avoid or reduce impacts;
3. Rectify impacts by repairing, rehabilitating, or restoring the affected environment;
4. Reduce or eliminate impacts over time by preservation and maintenance operations;
5. Compensate for the impact by replacing, enhancing, or providing substitute resources or environments; and for any of these five approaches
6. Monitor impacts, mitigation, and compensatory mitigation projects, taking appropriate corrective measures.

ORDINARY HIGH WATER MARK (OHWM⌖): On lakes, streams, and tidal water, that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation as that condition exists on June 1, 1971, as it may naturally change thereafter, or as it may change thereafter in accordance with permits issued by a local government or the department; provided that in any area where the ordinary high water mark cannot be found, the ordinary high

water mark adjoining salt water shall be the line of mean higher high tide and the ordinary high water mark adjoining fresh water shall be the line of mean high water.

REVISED CODE OF WASHINGTON (RCW): The compilation of all permanent laws now in force. A collection of Session Laws (enacted by the Legislature, and signed by the Governor, or enacted via the initiative process), arranged by topic, with amendments added and repealed laws removed. It does not include temporary laws such as appropriations acts.

SEASHORE CONSERVATION LINE (SCL): Originally, a line established in 1968 approximately one hundred feet (100') east of the vegetation line; the area west of the SCL is included in the Seashore Conservation Area. Now, a moveable line reviewed and re-established by the Washington State Parks & Recreation Commission every 10 years, starting in 1980. There are now 1980, 1990, 2000, and 2010 SCLs. The 1980 SCL is the current building setback line in Long Beach, and private construction may not occur west of the 1980 SCL.

SHORELINE MASTER PROGRAM (SMP): Local land use policies and regulations designed to manage shoreline use. An SMP is intended to protect natural resources for future generations, provide for public access to public waters and shores, and plan for water-dependent uses. SMPs are created by an Ecology-local community partnership, and must comply with the Shoreline Management Act and Shoreline Master Program Guidelines.

SHORELINE MASTER PROGRAM GUIDELINES: Shoreline Master Program (SMP) Guidelines are state standards that local governments must follow in drafting their shoreline master programs. The Guidelines translate the broad policies of the Shoreline Management Act (Revised Code of Washington RCW 90.58.020) into standards for regulation of shoreline uses. The SMP Guidelines are found at Chapter 173-26 Washington Administrative Code (WAC).

SHORELINE OF STATEWIDE SIGNIFICANCE (SSWS): The following shoreline of the state, among others: The area between the ordinary high water mark and the western boundary of the state from Cape Disappointment on the south to Cape Flattery on the north, including harbors, bays, estuaries, and inlets; therefore, the Long Beach shoreline is a SSWS. The Washington legislature has determined and declared that the interest of all of the people shall be paramount in the management of shorelines of statewide significance.

STAKEHOLDER: A party or entity (person, organization, group, etc.) who has an interest in the SMP update.

VISIONING: A community exercise whereby stakeholders express how they envision the future. Visioning can identify common goals community members can collectively attempt to achieve.

WASHINGTON ADMINISTRATIVE CODE (WAC): Regulations of executive branch agencies, issued by authority of statutes. Like legislation and the Constitution, regulations are a source of primary law in Washington state. The WAC codifies regulations and arranges them by subject or agency.

WATER-ORIENTED USE: A use that is water-dependent, water-related, or water-enjoyment, or a combination of such uses.

> **WATER-DEPENDENT USE:** A use or portion of a use which cannot exist in a location that is not adjacent to the water and which is dependent on the water by reason of the intrinsic nature of its operations.
>
> **WATER-ENJOYMENT USE:** A recreational use or other use that facilitates public access to the shoreline as a primary characteristic of the use; or a use that provides for recreational use or aesthetic enjoyment of the shoreline for a substantial number of people as a general characteristic of the use and which through location, design, and operation ensures the public's ability to enjoy the physical and aesthetic qualities of the shoreline. In order to qualify as a water-enjoyment use, the use must be open to the general public and the shoreline-oriented space within the project must be devoted to the specific aspects of the use that fosters shoreline enjoyment.
>
> **WATER-RELATED USE:** A use or portion of a use which is not intrinsically dependent on a waterfront location but whose economic viability is dependent upon a waterfront location because: 1) The use has a functional requirement for a waterfront location such as the arrival or shipment of materials by water or the need for large quantities of water; or 2) The use provides a necessary service supportive of the water-dependent uses and the proximity of the use to its customers makes its services less expensive and/or more convenient.

WETLAND(S): Those areas that are inundated or saturated by ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas to mitigate the conversion of wetlands.

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Executive Summary

The City of Long Beach is preparing this Restoration Plan in accordance with terms and conditions of Grant Agreement No. G1400375 with the Washington State Department of Ecology (Ecology)[1]. The current Shoreline Master Program (SMP) update, including this document, is intended to provide environmental protection for the area designated as "shoreline", to preserve and enhance public access to the shoreline, and to manage shoreline development. While this plan in and of itself is non-regulatory in nature, some of the strategies proposed herein would require legislative action, and thereafter would have regulatory authority.

This Plan focuses on what the city can reasonably achieve—including public education regarding restoration and the importance of shoreline functions and values as well as critical areas, restoring/improving wetland hydraulic connectivity and health, and improving species diversity through vegetation management.

Another environmental issue in the Long Beach shoreline that restoration efforts could improve is the presence of a substantial areal extent of two non-native dune grasses, which have pushed out the native beach grass. This plan recognizes this issue but does not propose restoration for it. There are several reasons for this:

- Scientific literature (Pickart, 1997; also see Appendix A to this document) and discussion with professionals who have experience with such restoration projects (personal communication, Jackie Ferrier, 2015) indicates its cost is beyond the means of the city of Long Beach, and long-term maintenance would drive cost even higher.
- The city is a small incorporated area surrounded by a vast area of unincorporated land that also has the same invasive species issues; for the city to undertake beach grass restoration independently of a much larger program would mean the city would be constantly "beating back" invasives at its borders. Such an effort seems to be more appropriately attempted at the regional level.
- Generally, beach grass restoration substantially reduces a dune's height, and the city is relying on its foredune for some measure of storm, tsunami, and coastal flooding protection.

For these reasons, this plan focuses on shoreline restoration the city believes is effective and achievable.

[1] The first use of an abbreviation, acronym, or term requiring definition in the document Glossary is marked with this symbol.

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1.0 Introduction

The City of Long Beach is updating its SMP. The City recognizes its shoreline, which is a Shoreline of Statewide Significance (SSWS), is an asset to all citizens of Washington state. This asset is valuable and can be fragile. For that reason, protecting the resources, functions, and values of the city's shoreline resources is of statewide importance, as well as of great local importance.

1.1 Background

The Washington state Shoreline Management Act (the Act, or SMA), charges local governments with—among other things—developing goals, policies, and regulations related to the utilization, protection, restoration, and preservation of shorelines, with the overall goal of improving ecological functions over time.

1.2 Purposes of this Document

The purpose of this document is to present a program intended to improve through restoration the shoreline functions for the shoreline of the City of Long Beach. In addition, this document explains the methodology employed to develop the proposed restoration program.

1.3 How to Use this Document

The public can best use this document to gain an understanding of the city's vision for shoreline restoration, as well as opportunities and strategies for restoration.

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2.0 Methodology

2.1 Restoration Principles

The SMP Guidelines at Washington Administrative Code (WAC) at 173-26-186(8)(c) set out the following governing principles for development of goals and policies for the restoration of impaired ecological shoreline functions:

1. Identify existing policies and programs that contribute to planned restoration goals.
2. Identify any additional policies and programs that local government can implement to achieve its goals.
3. Make real and meaningful use of established or funded non-regulatory policies and programs that contribute to restoration of ecological functions.
4. Consider the direct and indirect effects of other regulatory or non-regulatory programs under other local, state, and federal laws, as well as any restoration effects that may flow indirectly from shoreline development regulations and mitigation standards.

2.2 Approach to Restoration

Using these guiding principles, the SMP Guidelines at WAC 173-26-201(2)(f) require a shoreline restoration plan to accomplish the following:

1. Identify degraded areas, impaired ecological functions, and sites with potential for ecological restoration;
2. Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions;
3. Identify existing and ongoing projects and programs, or those that are reasonably assured of being implemented based on their likelihood of being funded, which are designed to contribute to local restoration goals;
4. Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs;
5. Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals; and
6. Provide for mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals.

2.3 Approach to Work

To prepare an effective restoration plan in the manner required by law, the city built it on work already prepared as part of this SMP update. The city also reviewed work by others, and in some cases adopted ideas found in others' work.

First, the city reviewed the Inventory and Characterization Report (City of Long Beach, 2015) prepared as part of this SMP update. That report identified specific areas that may benefit from restoration. City staff either confirmed or revised the findings of that report regarding restoration opportunities, and included those they deemed viable in this plan.

The city then reviewed the Community Visioning[®] Study (City of Long Beach, 2015b) prepared as part of this SMP update. That report includes the public's vision for a future Long Bach shoreline, as well as certain proposed goals and strategies that could implement such a vision. Some of the proposed strategies that resulted from the community visioning process are about restoration, and so are included in this plan.

The city also reviewed the Draft Shoreline Designations (SED[®]) Report (City of Long Beach, 2015c) prepared as part of this SMP update. That report includes proposed goals and strategies that could support the classification system and result in, among other things, shoreline environmental protection. Some of the proposed strategies of the SED report are about restoration, and so are included in this plan.

Finally, the city also discussed restoration efforts on the Long Beach Peninsula with government staff and other professionals familiar with restoration on the Peninsula to identify existing projects and programs that might be relevant to Long Beach. (Sayce, *et al*, 2006, 2006b, 2006c)

3.0 Results

3.1 Degraded Areas

This section describes the degraded environmental areas or conditions located within the reaches described in the SMP update Inventory and Characterization Report. (City of Long Beach, 2015) For each reach, a very brief summary of environmental assets is followed by a bullet list of the degraded areas or conditions of that reach, and completed by a brief assessment of restoration opportunities.

3.1.1 Reach No. 1

This reach encompasses about 48 acres of beach pine forest and wetland vegetation. Degraded areas or conditions include the following:

- In two (2) locations, interdunal wetlands[♦] appear to have been functionally isolated by driveways that do not have culverts.
- Invasive Scotch broom (*Cytisus scoparius*) occurs sporadically in this reach.
- Extensive non-native beachgrasses exist across this reach.

Restoration Opportunities

1. Increase city efforts to have property owners eradicate invasive nuisance species.
2. Install culverts as opportunities arise to restore hydraulic connectivity.

3.1.2 Reach No. 2

This reach encompasses about 18.3 acres of beach pine forest and wetland vegetation. Degraded areas or conditions include the following:

- Wetlands located north and south of 7th Street Southwest appear to have been functionally isolated by the road, which does not have culverts.
- Invasive Scotch broom (*Cytisus scoparius*) occurs sporadically in this reach
- Two man-made wetlands of about 1.25 acres each exist that function well, but are exposed to human behaviors such as hand-held trash dumping.
- Extensive non-native beachgrasses exist across this reach.

Restoration Opportunities

1. Culvert installation in 7th Street Southwest in the vicinity of the Shoreview Drive right-of-way could restore north-south hydraulic connectivity in this area.
2. Hydraulic connectivity could be established between the two relatively large wetlands located west of Windward Passage and west of the On-the-Boardwalk townhomes, which are located immediately south of Windward Passage.

3. Increase city efforts to have property owners eradicate invasive nuisance species.
4. Sign the wetland edges with city signage.

3.1.3 Reach No. 3

This reach encompasses about 19.7 acres of beach pine forest and wetland vegetation. Degraded areas or conditions include the following:

- Wetlands located north and south of 3rd Street Southwest appear to have been functionally isolated by the road, which does not have culverts.
- Two trail segments in this reach south of Bolstad West bisect wetlands.
- The stands of pine forest in this reach vary in density from moderate to extremely dense.
- Invasive Scotch broom (*Cytisus scoparius*) occurs in this reach, fairly thickly in some areas.
- Extensive non-native beachgrasses exist across this reach.

Restoration Opportunities

1. Culvert installation in 3rd Street Southwest west of the 1889 Line[†] and east of the public parking lot could restore north-south hydraulic connectivity in this area.
2. Two trail segments in this reach south of Bolstad West bisect wetlands. Board-walking these areas could restore habitat value and improve hydraulic continuity.
3. Eradicate invasive nuisance species on city-managed lands.

3.1.4 Reach No. 4

This reach encompasses about 11.5 acres of beach pine forest and wetland vegetation. Degraded areas or conditions include the following:

- Invasive Scotch broom (*Cytisus scoparius*) occurs sporadically in this reach.
- It has been reported by a citizen that installed culverts across 6th Street have been plugged or destroyed.
- An east-west trending driveway located just south of 8th Street Northwest has experienced flooding, and has wetland located immediately to its north and south.
- A home along 6th Street Northwest graveled a wetland buffer for parking.
- Extensive non-native beachgrasses exist across this reach.

Restoration Opportunities

1. It has been reported by a citizen that installed culverts across 6th Street have been plugged or destroyed. Culvert installation could restore north-south hydraulic connectivity in this area.
2. An east-west trending driveway located just south of 8th Street Northwest has experienced flooding, and has interdunal wetlands located immediately to its north and south. Possibly

reconfiguration of this drive or installation of additional or larger diameter culverts could increase hydraulic connectivity in this area.

3. A home along 6th Street Northwest graveled a wetland buffer for parking. Gravel could be removed and the area allowed to recover. This would protect and possibly enhance habitat.
4. Increase city efforts to have property owners eradicate invasive nuisance species.

3.1.5 Reach No. 5

This reach encompasses about 17.8 acres of beach pine forest and wetland vegetation. Degraded areas or conditions include the following:

- Invasive Scotch broom (*Cytisus scoparius*) occurs sporadically in this reach.
- Extensive non-native beachgrasses exist across this reach.

Restoration Opportunities

1. Eradicate invasive nuisance species on city managed lands.

3.1.6 Reach No. 6

This reach encompasses about 0.03 acre of wetland vegetation, with no beach pine forest. Degraded areas or conditions include the following:

- One trail segment in this reach west of the Chautauqua Lodge bisects wetlands.
- Extensive non-native beachgrasses exist across this reach.

Restoration Opportunities

1. One trail segment in this reach west of the Chautauqua Lodge bisects wetlands. Board-walking this area could restore habitat value and improve hydraulic continuity.
2. Increase city efforts to have property owners eradicate invasive nuisance species.

3.1.7 Reach No. 7

This reach encompasses about 38.5 acres of beach pine forest and wetland vegetation. Degraded areas or conditions include the following:

- In this mostly residential reach, some wetlands appear to have been functionally isolated by road or driveways that do not have culverts.
- Invasive Scotch broom (*Cytisus scoparius*) occurs sporadically in this reach, as does gorse (*Ulex*).
- Extensive non-native beachgrasses exist across this reach.

Restoration Opportunities

1. Install culverts as opportunities arise to restore hydraulic connectivity.
2. Increase city efforts to have property owners eradicate invasive nuisance species.

3.1.8 Reach No. 8

This reach encompasses about 7.8 acres of wetland vegetation, with two narrow areas of relatively sparse pine forest occur in Reach No. 8 at the north and south fringes. Degraded areas or conditions include the following:

- Casual observation indicates that Scotch Broom (*Cytisus scoparius*) is present at the north and south edges of this reach.
- Wetlands north and south of 28th Street Northwest appear to have been functionally isolated by the road, which does not have culverts.
- Extensive non-native beachgrasses exist across this reach.

Restoration Opportunities

1. Installation of culverts in 28th Street Northwest could restore hydraulic continuity.
2. Increase city efforts to have property owners eradicate invasive nuisance species.

3.1.9 Reach No. 9

This reach encompasses about 9.1 acres of beach pine forest and wetland vegetation. Degraded areas or conditions include the following:

- Invasive Scotch broom (*Cytisus scoparius*) and gorse (*Ulex*) occur in this reach.
- Extensive non-native beachgrasses exist across this reach.

Restoration Opportunities

1. Installation of culverts at 30th Street Northwest could restore or improve hydraulic continuity.
2. Increase city efforts to have property owners eradicate invasive nuisance species.

3.1.10 Reach No. 10

This reach is the ocean beach and the Pacific Ocean westward 3 miles from the ordinary high water mark[♦] (OHWM[♦]). Degraded areas or conditions include the following:

- Ocean acidification
- Ocean warming

Restoration Opportunities

While the ocean has been degraded, there do not appear to be substantial or meaningful restoration opportunities that are within the means of the city to effectively address in Reach No. 10.

3.2 Goals and Priorities

The majority of the Long Beach shoreline located west of the OHWM or within 200 feet east of the OHWM is relatively free of modification. Those modifications that do exist in this area—two outfalls, portions of public access facilities (including the two main beach approaches), public art installations—serve the common good. There are no private structures or other alterations in this area. However, in the area of associated wetlands between the 1889 Line to the east and the 1980 Seashore Conservation Line[◆] (SCL[◆]) to the west, overall moderate permanent human alteration has occurred; some locations where subdivision has occurred are substantially altered.

The following goals and objectives are meant to restore degraded areas and impaired ecological functions to the extent practicable. It focuses on what the city can reasonably achieve – including public education regarding restoration and the importance of shoreline functions, values, and critical areas; restoring/improving wetland hydraulic connectivity; and improving species diversity via vegetation management.

3.2.1 Goals and Objectives

Goal 1: Achieve no net loss of shoreline functions and values

Objective 1-1: Restore hydraulic connectivity to functionally isolated wetlands.

Objective 1-2: Avoid adverse impacts to the extent practicable.

Objective 1-3: Enforce the city's Critical Areas regulations in the shoreline area.

Objective 1-4: Increase public awareness of the functions that shorelines serve, and the value of those functions

Goal 2: Provide restoration opportunities for re-establishment and/or rehabilitation of impaired shoreline functions through voluntary, incentive-based public and private programs consistent with the intent of the SMA and the City's Critical Areas regulations

Objective 2-1: Reclaim and restore biologically degraded areas to the extent practicable while continuing to allow appropriate shoreline development.

Objective 2-2: Consider and conduct a public dialogue about allowing the foredune to return to its natural profile (to "fill in") at the two main beach approaches to protect from storms, coastal flooding, and tsunamis, and to retain a more natural view of the dune from the beach.

Goal 3: Increase shoreline biological diversity

Objective 3-1: Reduce the quantity of and the extent of Scotch broom and gorse over time; eventually eradicate.

3.3 Existing or Foreseeable Restoration Plans and Organizations

A number of existing plans are in effect and organizations are involved relevant to shoreline restoration and protection in and around Pacific County and the City of Long Beach. They are briefly discussed below.

3.3.1 Long Beach Comprehensive Plan

The Environment Element of the Long Beach Comprehensive Plan (City of Long, 2008) includes goals and strategies that directly or indirectly address restoration and protection of ecological functions. These include the following:

Goal 4-2: Protect the aesthetic quality and ecological functions and values of wetlands and the shoreline dune complex.

Strategy 4-2-e: Coordinate wetland and shoreline protection and enhancement plans with Pacific County where jurisdictional boundaries are involved.

Strategy 4-2-f: Encourage clustering of buildings in shoreline zones to protect natural areas, without compromising the overall density assigned to the property.

Goal 4-3: Comply with the SMA to protect environmentally sensitive critical areas, such as wetlands, shoreline dunes. and habitat.

Strategy 4-3-e: Mitigate wetland functions by replacing or enhancing the lost functions. Alleviate habitat fragmentation, or restore an area that was historically a wetland, resulting in net improvement to functions and values of the wetland system.

Strategy 4-3-h: Use incentives to protect or enhance the natural environment where practicable, including and not limited to buffer averaging, density bonuses, or other non-regulatory measures.

3.3.2 Pacific County Strategic Plan for Salmon Recovery

The overarching goal of this plan, which applies to Water Resource Inventory Area (WRIA 24) is to "reestablish the connection between fish and their habitat through the identification of human actions and their effects on salmon survival." (Applied Environmental Services, Inc., 2001) The plan provides a framework for prioritizing and selecting habitat restoration and protection projects most likely to effectively and significantly contribute to sustained salmon survival. Recommended restoration strategies include removing migration barriers; protecting and restoring riparian habitat; reducing sediment loads; replenishing stream productivity; and protecting intact and high-quality key habitats.

No fish habitat occurs in Long Beach west of the OHWM. However, Salmon do migrate offshore, and this plan considers strategies to reduce or eliminate sediment loads to the ocean via development controls in the shoreline area.

3.3.3 Pacific County Marine Resource Council (MRC)

The Pacific County MRC is a 28-member appointed citizen board that serves as a steward for the marine and estuarine resources in the county by facilitating science-based policies, research, and education that enhance the sustainability of the economy and ecology of Pacific County communities.

3.4 Potential Restoration Projects and Programs (Strategies)

For each objective identified above, this plan proposes strategies to implement that objective. In total, these strategies comprise a shoreline restoration program. The city intends to take an adaptive management approach to this plan: as strategies are implemented, their success as well as unanticipated secondary effects will be assessed, and the program modified to increase effectiveness and reduce impacts.

3.4.1 Achieve no net loss

Objective 1-1: **Restore hydraulic connectivity to functionally isolated wetlands.**

Strategy 1-1.1: Require restoration as part of development approval as opportunities arise.

Strategy 1-1.2: Require culverts in all new roads where culverts would retain or restore hydraulic connectivity.

Strategy 1-1.3: Establish a program of culvert installation in existing roads where such installation would restore hydraulic connectivity. Culvert at least one (1) road per year under this program. Currently, approximately eight (8) streets/driveways and three (3) trails appear to be candidates for hydraulic improvement.

Objective 1-2: **Avoid adverse impacts to the extent practicable.**

Strategy 1-2.1: All development, including water-dependent and preferred shoreline uses, shall be subject to mitigation sequencing.

Strategy 1-2.2: Adhere to mitigation sequencing as described in WAC 173-26-201 (2)(e), including the following, listed in order of preference:

- Avoid impacts altogether by not taking a certain action or parts of an action;
- Minimize impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to avoid or reduce impacts;
- Rectify impacts by repairing, rehabilitating, or restoring the affected environment;

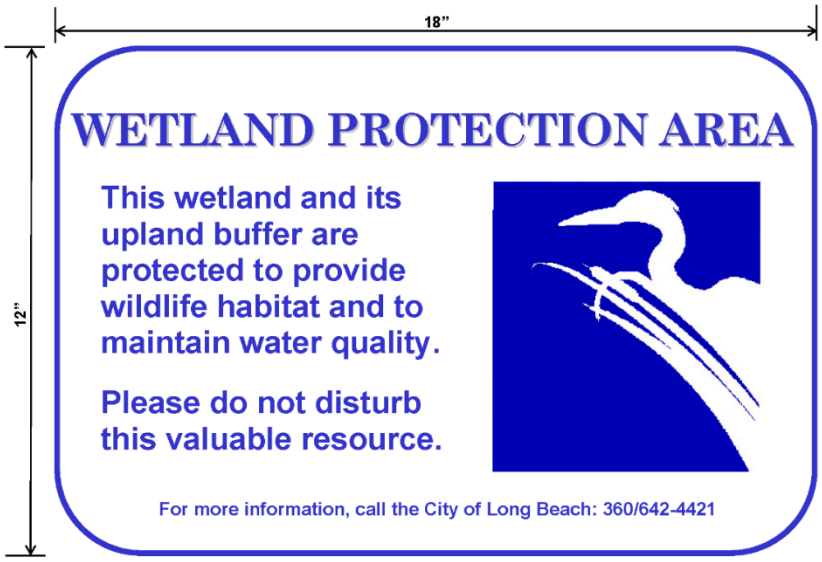
- Reduce or eliminate impacts over time by preservation and maintenance operations;
- Compensate for the impact by replacing, enhancing, or providing substitute resources or environments; and
- Monitor impacts, mitigation, and compensatory mitigation projects, taking appropriate corrective measures.

Strategy 1-2.3: All new development shall result in no net increase in runoff, and shall be required to demonstrate this requirement is met.

Objective 1-3: Enforce the city's Critical Areas regulations in the shoreline area.

Strategy 1-3.1: Require buffers and setbacks pursuant to the most current adopted version of the city's Critical Areas Regulations.

Strategy 1-3.2: Pursuant to the City's Critical Areas regulations, require posting of the city's wetland signage as a condition of approval for developments located on properties with wetlands. (see sign, below)



Objective 1-4: Increase public awareness of the functions that shorelines serve, and the value of those functions

Strategy 1-4.1: Include at least one new interpretive panel on the city's boardwalk regarding shoreline functions and values and their importance.

Strategy 1-4.2: Offer the city's wetland signage to owners of property with wetlands at a reasonable cost, or if funding is found, at no cost. (see sign, above)

Strategy1-4.3: The objectives of RCW 90.58.020 should be clearly relayed to the public, including the following:

- Recognize and protect the statewide interest over local interest;
- Preserve the natural character of the shoreline;
- Result in long term over short term benefit;
- Protect the resources and ecology of the shoreline;
- Increase public access to publicly owned areas of the shorelines;
- Increase recreational opportunities for the public in the shoreline;
- Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary.

3.4.2 Provide restoration opportunities

Objective 2-1: Reclaim and restore biologically degraded areas to the extent practicable while continuing to allow appropriate shoreline development.

Strategy 2-1.1: Remove refuse or old fill in wetlands located on land under city or state jurisdiction.

3.4.3 Increase biological diversity

Objective 3-1: Reduce the quantity of and the extent of Scotch broom and gorse over time; eventually eradicate.

Strategy 3-1.1: Develop and adopt by ordinance a vegetation management program, including a public information component.

Strategy 3-1.2: Encourage owners of property with Scotch broom and/or gorse and/or other noxious vegetation or other invasive species to eradicate same.

Strategy 3-1.2: Work with Pacific County Noxious Weed Board to establish a program of invasive noxious plant eradication.

3.5 Restoration Timelines and Benchmarks

To start, shoreline functions and values will be at a minimum maintained if not improved; over time with restoration, functions and values should improve.

3.5.1 In One Year

At the end of the first year, the following benchmarks should be met:

1. The city will adopt via ordinance a shoreline vegetation management plan, including public participation, and then disseminate its contents to the public.
2. The city and county will have established a joint invasive plant eradication agreement.
3. The city will have explained its wetland signage to the public and offered signage to owners of private property that have wetlands.

4. All new development on property where wetlands are located will sign the wetlands.
5. All new development will result in zero increased off-site runoff and sedimentation.
6. All new roadways that traverse wetlands will include sufficient culverts to maintain wetland hydraulic connectivity.
7. The city will develop language explaining the value of wetlands and will include it in utility bills, and will produce a wetland brochure and include it on the city's website.

3.5.2 In Five Years

At the end of five (5) years, the following benchmarks should be met:

1. Hydraulic connectivity will be restored in at least five (5) locations where existing roads have functionally isolated one portion of a wetland from another.
2. At least one (1) new interpretive board will be installed in the boardwalk addressing the importance of the restoration of shoreline functions and values.
3. At least 20 owners of property with wetlands will have installed the city's wetland signage.
4. All wetlands located on property under the jurisdiction of the city or the state will be signed.
5. All unauthorized fill located on property under the jurisdiction of the state or city will be removed.
6. 75% of invasive Scotch broom and gorse will have been eradicated.

3.5.3 In Ten Years

At the end of ten (10) years, the following benchmarks should be met:

1. Hydraulic connectivity will be restored in all locations where existing roads have functionally isolated one portion of a wetland from another.
2. At least 40 owners of property with wetlands will have installed the city's wetland signage.
3. All invasive Scotch broom and gorse will have been eradicated, with annual maintenance controlling these species.

4.0 Acknowledgements

The City of Long Beach is one of numerous government entities in the State of Washington required to update its SMP. We do this in accordance with Ecology's SMP Guidelines, the requirements of individual but similar SMA Grant Agreements, and following Ecology's Master Program Planning Process. Therefore, there exists a consistent SMP update approach across the State; this consistency of approach leads to a general product consistency while taking into account local circumstances. For that reason, Long Beach looked toward its colleagues and their SMP update work products in preparing this report; we saw no reason to re-invent the wheel. The City reviewed several existing visioning reports, and they are identified in the reference section of this report. Thanks to our colleagues who went before us in the SMP update process for creating a most worthwhile legacy.

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APPENDICES

A Article: *Control of European Beachgrass (Ammophila arenaria) on the West Coast of the United States.*

Control of European Beachgrass (Ammophila arenaria) on the West Coast of the United States

Andrea J. Pickart
The Nature Conservancy Lanphere-Christensen Dunes Preserve
Arcata, CA 95521

European beachgrass *(Ammophila arenaria)* is the most pervasive exotic plant species currently threatening coastal dunes on the west coast of the U.S. *Ammophila* is invasive in every major dune system from Santa Barbara County, CA, to the northernmost dunes of Washington. Active management of this species is on the rise, in part because of the Federal listing under the Endangered Species Act in 1993 of the western snowy plover.

Although interest in controlling *Ammophila* began about 1980, real success was not encountered until 1990, and implementation of control efforts on a large scale is still new and undergoing refinement. In 1997 management of *Ammophila* was carried out by a total of seven agencies on eight different dune systems in Oregon and California at a total cost of $131,000 (Table 1). Currently in use are manual, mechanical, and chemical methods of control, used alone or in combination. The goals of these efforts have differed, as have their success.

Ammophila is now so widespread on the west coast of the U. S. that its eradication is not practical unless a more economic means of control is found.

Species Biology

Ammophila is a perennial, rhizomatous grass native to coastal dunes in Europe between the latitudes of 30° and 63° N. It spreads primarily by rhizomes, although viable seeds are produced. Long distance dispersal is usually by marine transport of dormant rhizomes, which can withstand submersion for long periods (Baye 1990).

Once established, *Ammophila* develops vigorous root and rhizome systems. Active sand burial stimulates the production of rhizomes (Gemmell et al. 1953, Greig-Smith 1961). This growth pattern results in dense clusters of shoots and in part accounts for *Ammophila's* dense growth habit and "phalanx-like" spread (Fig. 1). *Ammophila* can tolerate more sand burial than the native dunegrass *(Leymus mollis)*, but has a lower salt tolerance. Without fresh sand burial, *Ammophila* declines in vigor. This phenomenon has been attributed to a variety of factors, including exposure to pathogens that reduce the formation of new tillers (van der Putten et al. 1988). Fresh sand accumulation allows *Ammophila* to escape build-up of these organisms.

Introduction History

Planting of *Ammophila* on west coast dunes was common in the first half of the twentieth century. First introduced at Golden Gate Park, San Francisco, in the late 1800s (Lamson-Scribner 1895), the species was heralded as a desirable sand stabilizer and was eventually embraced by U. S. Soil Conservation Service and other agencies. Thousands of acres of west coast sand dunes were stabilized during this period (Reckendorf et al. 1987), the majority located along the Oregon coast. As a result, the Oregon and Washington coastlines are now largely lacking intact native foredune plant communities.

The introduction and spread of *Ammophila* has been closely traced for the North Spit of the Humboldt Bay dunes, providing a good illustration of its patterns of invasiveness. Buell et al. (1995) documented the extent of *Ammophila* on the spit at intervals between 1901 (its first introduction) and 1989. After 1939 it expanded exponentially, increasing over 600% in area. Despite multiple introduction dates and interactions with other competing non-native species like yellow bush lupine *(Lupinus arboreus)*, the rate of spread has been consistent with invasion models (Hengeveld 1989, van den Bosch et al. 1992). The pattern of spread has been bimodal, as described by Baker (1986) and Hengeveld (1989). Movement along foredunes has been via continuous "wavefronts" while more inland areas have been characterized by "broken-up fronts" of independently propagating foci.

Table 1. Total Ammophila acreage in California dunes and in the Oregon Dunes National Recreation Area, and the amount expended on control in 1997.

Dune system	Ttl. Acres Ammo	Managing agency	Site/Project	Cost in 1997
Oregon Dunes	9,000	U.S. Forest Service	Oregon Dunes N.R.A.	$38,000
(Reedsport to Florence)		U.S. Bureau of Land Mgt.	Coos Bay Shorelands	$30,000
Lake Earl Dunes	1,300	Calif. Dept. of Parks & Rec.	Lake Earl State Park	No control
		Calif. Dept. of Fish and Game	Lake Earl Wildlife Area	No control
Gold Bluffs Beach	200	National Park Service/Calif. Dept. of Parks & Rec.	GoldBluffs Beach/Redwood National & State Parks	No control
Freshwater Lagoon	3	U.S. Park Service/ Calif. Dept. of Parks & Rec.	Freshwater Lagoon / Redwood	No control
Big, Dry. & Stone Lagoons	10	Calif. Dept. of Parks & Rec.	Humboldt Lagoons State Park	No control
Humboldt Bay Dunes	1,026	The Nature Conservancy	Lanphere-Christensen Dunes	$10,000
		U.S. Bureau of Land Mgt.	Manila Dunes ACEC/ONA	$20,000+
			Samoa Dunes NRA	volunteer
		Center for Natural Lands Mgt.	Manila Beach & Dunes/	$5,000+
			Eureka Dunes Protected Area	volunteer
		Humboldt County	Mad River & Clam Beach	No control
			County Parks	
		Calif. Dept. of Parks & Rec.	Little River State Beach	No control
		Calif. Dept. of Fish & Game	Eeel Rivei Wildlife Area	No control
Ten Mile Dunes	125	Calif. Dept. of Parks & Rec.	MacKerricher State Park & Inglenook Fen-Ten Mile Dunes Preserve	$15.000
Manchester Dunes	520	Calif. Dept. of Parks & Rec.	Manchester State Beach	No control
Bodega Bay	860	Calif. Dept. of Parks & Rec.	Sonoma Coast State Beach	No control
		Univ. of Calif. Reserves	Bodega Marine Reserve	No control
Point Reyes	1,600	National Park Service	Abbott's Lagoon, Point Reyes National Seashore	volunteer
San Francisco Bay	11	National Park Service	Golden Gate NRA	volunteer
Monterey Coast Dunes	80	Calif. Dept. of Parks & Rec.	Zmudowski, Marina, Salinas	$3,000
			River, & Moss Landing	
			State Beaches, Ft. Ord	
Monterey Peninsular Dunes	7	Calif. Dept. of Parks & Rec.	Asiloma State Park	volunteer
Morro Bay Dunes	55	Calif. Dept. of Parks & Rec.	Montana de Oro State Park & Morro Strand State Beach	No control
Guadalupe-Nipomo Dunes	275	The Nature Conservancy	Mobil Coastal Preserve	$1.000
		Calif. Dept. of Parks & Rec.	Pismo Dunes State Reserve, Oceano Dunes State Vehicular Rec. Area, & Oso Flaco Lake Natural Areas	No control
San Antonio Terrace Dunes	80	U.S. Air Force	Vandenburg Air Force Base	$12,000

Fig. 1. The dense shoot pattern of Ammophila causes its phalanx-like spread.

Ecological Impacts

Ammophila has had a devastating impact on the inherently restricted dune resources of the west coast. *Ammophila* is a better sand accumulator than the native dunegrass, and creates a higher, steeper foredune, decreasing sand flow to interior dunes (Wiedemann and Pickart 1996). Although cyclic stabilization of dunes is a naturally occurring phenomenon in the Pacific Northwest regulated by tectonic events (Clark and Carver 1992, Komar and Shih 1993), the presence of *Ammophila* shortens the time for stabilization, and in addition, drastically alters natural succession (Wiedemann and Pickart 1996).

Perhaps the most significant impact of *Ammophila* is its ability to displace entire native plant communities with its phalanx-like mode of spread. The native dunegrass series (Sawyer and Keeler-Wolf 1995) is restricted to the primary or first parallel foredune along the coast. Once occurring along most major dune systems of the west coast north of Monterey, CA, this community is now restricted to only two location, at Point Reyes and Humboldt Bay (Pickart and Sawyer, in press). The relatively more extensive sand verbena-beach bursage series, which once occurred on semi-stable dunes along the entire coast, has also been tremendously impacted by the spread of *Ammophila*. In a number of dune systems, especially those where *Ammophila* was deliberately planted and cultivated, this community is near extirpation.

Ammophila currently or potentially impacts six Federally listed endangered plants that occur on coastal dunes of California: *Chorizanthe howelld, C. pungens* var. *pungens, Erysimum menziesii, Gilia tenuiflora* ssp. *arenaria, Layia camosa,* and *Lupinus fidestromii (U.S.* Fish and Wildlife Service 1997). The species is also detrimental to the threatened western snowy plover, a shorebird that nests in open areas on the strand. Dense stands of *Ammophila* directly displace nesting sites, and enhance cover for predators, thus decreasing nesting success (U.S. Fish and Wildlife Service 1995).

Control

Ammophila, with its extensive underground rhizome network, is extremely tenacious and its eradication has proven to be a continuing challenge to managers. It has required a decade of research and experimental trials to develop effective eradication techniques, and when applied on a large scale these methods show variable success (Pickart and Sawyer, in press). The arsenal of known techniques now includes manual, mechanical, and chemical alternatives, but refinements and other methods are still being sought.

Manual Removal

Manual removal has been used with great success, but at great expense, at the The Nature Conservancy's (TNC) Lanphere-Christensen Dunes Preserve in Humboldt Bay dunes. The method was first tested and found to be successful over a two-year period in small isolated stands (Pickart et al. 1990). Between 1992 and 1997, a ten-acre area of *Ammophila* was subjected to repeated manual digging using California Conservation Corps labor (Miller 1994). The area was divided into three sub-areas, each of which was initiated in a different year. A patchwork of small stands comprised each sub-area to reduce erosion, but it was found that this was unnecessary since dead *Ammophila* stubble provided sufficient stabilization. In fact, the use of small stands increased edge and therefore cost.

The first removal was carried out in March, as plants emerged from dormancy. A shovel was used to sever rhizomes at a depth of about eight inches, since the majority of active rhizomes were found to be in this region. Grass was piled and later burned. Resprouting occurred throughout the season, more vigorously at first. Crews returned to pull and/or dig resprouts an average of eight times over the first season, and seven times the second season. By the end of the second season plants were largely eradicated. Some of the stands were scattered in remote areas and did not receive systematic treatment; these areas will require additional follow-up.

Ammophila often hides small, relict native plants. After the *Ammophila* was removed, these plants flourished, eliminating the need for revegetation. This is a significant benefit realized by the manual method, as it is possible to selectively retain native plants. The elimination of revegetation work saves on costs and should be considered in the choice of eradication method. By 1997, at the TNC site, native plant cover had reached 45% of the cover found in sites not invaded by *Ammophila* (Fig. 2).

Fig. 2. Native plants colonizing an area formerly covered with *Ammophila* the The Nature Conservancy's Lanphere-Christensen Dunes Preserve.

The amount of labor required to dig, pile, and burn beachgrass was 1,858 person-hours/acre. An additional 1,093 person-hours/acre were required for the time it took to transport CCC crews from the CCC center to the site (90 minutes roundtrip) and to walk from the trailhead to the restoration area (90 minutes roundtnp). At the current local CCC rate of $11.75/hour, the cost of removal was $21,831/acre and the cost of transportation was $12,843/acre, for a total of $34,674/acre. This per-acre cost covers removal of a continuous beachgrass cover; in actuality, beachgrass is often spread out over a larger area or mixed with native vegetation. The cost would be significantly lower for a less remote site.

The most labor-intensive part of manual control is the first dig, due to the large biomass, density of stems, and the difficulty of severing rhizomes. To determine whether this first dig could be replaced with a labor-

saving controlled burn, the Center for Natural Lands Management recently established an experiment at the Manila Beach and Dunes in Humboldt Bay dunes. Burning is known to stimulate growth in *Ammophila* (Van Hook 1983), and will presumably increase resprout vigor or density. However, it is hypothesized that the increased labor required to remove resprouts after a burn may still represent a time savings over the initial dig.

Mechanical Removal

Heavy equipment has been used extensively to control *Ammophila* at Oregon Dunes National Recreation Area (NRA). The NRA has approximately 6,000 acres of *Ammophila*, with few remaining examples of intact native plant communities. The U.S. Forest Service is primarily managing the beachgrass for western snowy plower habitat, although restoration of native plant communities is a stated goal (Segotta 1995). Heavy equipment is used in combination with manual and chemical control.

Over the past 3 years, the Forest Service has treated a total of 45 acres of *Ammophila* with a D-8 Caterpillar. *Ammophila* is excavated and theoretically buried to a depth of 3 feet, although in actuality the depth of burial is inconsistent and is often less than 3 feet, reducing the effectiveness of the treatment. Moderate resprouting has occurred in these areas (Fig. 3), and requires manual follow-up. A single follow-up dig has been effective, although insufficient for complete eradication. The use of herbicide as a follow-up to mechanical is not effective because of the limited surface area exposed to the herbicide.

Fig. 3. Resprouts; of *Ammophila* in an area previously treated using heavy equipment at Oregon Dunes National Recreation Area.

At the nearby Coos Bay Shorelands, the U.S. Bureau of Land Management used a different mechanical treatment on 50 acres of Ammophila adjacent to a snowy plover nesting site (Rittenhouse, pers. comm.). In the summer of 1996, the grass had been unsuccessfully treated with salt water. In fall 1996 a D-8 Caterpillar with a wing ripper was used to "subsoil" or "rip" rhizomes 3 feet below the surface. In early March 1997 this treatment was followed by a single manual pulling treatment. Plants were easily pulled by hand. This combination of treatments appeared to be very effective (Fig. 4); however separating out the effects of earlier treatments (disking, salt water) was not possible.

Obviously, mechanical removal is only suitable for sites that are easily accessible, relatively flat, and without significant numbers of native plant. The cost of this treatment has not been estimated, and varies depending on whether equipment and operators are available to the managing agency. Compared with manual removal, the method is more impact-intensive, detrimental to invertebrates and vestigial native plants. If the goal

is to establish native plant communities, revegetation will be necessary. However, for a large area, and if done with sufficient quality control, it should be more cost-effective than manual removal.

Fig. 4. Only a few resprouts have returned in an area formerly dominated by Ammophila at Coos Bay Shorelands in Oregon. The site was treated unsuccessfully with salt water irrigation in summer 1996, "ripped" with a wing-ripper in fall 1996, and subjected to one hand-pull of resprouts in March 1997. The photograph was taken in August 1997.

Chemical Control

Glyphosate (Roundup and Rodeo) has been used with some success on Ammophila, although its effectiveness is dependent on consistency and thoroughness. A label recommendation of 8% Rodeo plus 0.5 to 1.5%nonionic surfactant (spray-to-wet) was developed for Oregon, Washington, and California following trials by the California Department of Parks and Recreation, the Oregon Department of Fish and Wildlife, and the Monsanto Company. Rodeo, a form of glyphosate without surfactant, was preferred in Oregon because of concerns about groundwater contamination. Rodeo is approved for aquatic use because it lacks the polyethoxylated tallowarnine present in the surfactant in Roundup. The label also recommends wiper applications for selective control, using a 33% solution plus 1.0 to 2.5% nonionic surfactant and avoiding contact with desirable vegetation. For either method, plants should be treated during periods of active growth.

The use of Roundup to control Ammophila was tested extensively by the California Department of Parks and Recreation and the University of California Davis at several California dune systems. Although results have not been published, the investigator reports good success using a 10% solution with added surfactant (0.5%) (Aptekar, pers. comm.). Since these experiments were carried out, the surfactant in Roundup has been reformulated by Monsanto, which recommends no additional surfactant be added to Roundup-Pro or Roundup-Ultra (McColly, pers. comm.).

Herbicides have been used on Ammophila most extensively at the Oregon Dunes National Recreation Area. In 1996-1997 about 60 acres of Ammophila were sprayed with an 8% solution of Rodeo (with surfactant) at Tahkenitch and Ten Mile dunes. In the first year only one application was used. Results were inconsistent, with some areas clearly missed. However, overall density and cover was significantly reduced (Segotta, pers. comm). In the second year (1997), missed areas were resprayed, and new areas were given two applications, but results are not yet available.

Chemical treatment of *Animophila* is likely to be the most cost-effective method of those used to date. There are, however, problems with this method. Herbicides have biological impacts and may be politically

unacceptable in a given area or for a particular agency (for example, the Bureau of Land Management is under an injunction prohibiting the use of herbicides on non-noxious weeds). When native plants are present, selective spraying may be difficult or impossible. After spraying, dead biomass must be removed if revegetation is to occur. If only a small amount of *Ammophila* regeneration occurs, it is infeasible to treat it with herbicide since surface area will be insufficient. If complete eradication is desired, manual follow-up may still be required at an additional cost, and the cost of revegetation must be added.

The use of salt water as a method of chemical control was attempted over a 25-acre stand of *Ammophila* in Coos Bay Shorelands by the U.S. Army Corps of Engineers (U.S. Army Corps of Engineers 1996). A six-cylinder diesel pump was used to supply by water to a sprinkler system. Sprinkler guns were moved along lateral lines and operated for 24-hour periods, resulting in the deposition of about 12 inches of salt water. Three 12-inch applications were made between June and September, and were expected to raise soil salinity to at least 2% to a depth of 3 feet (the salt tolerance of *Animophila* is 1 to 1.5%). Although the treatment resulted in initial browning, observations on the site indicated that salt water did not penetrate below the top 5 inches of the soil.

There is still some interest in using salt water to control *Ammophila*. One drawback of this method is the broad nature of its impacts. Although *Ammophila's* tolerance to salt water is lower than for some native plants, the salt is likely to be toxic to some desirable plant species and to other organisms, including beneficial soil microbes.

The Need for a Regional Control Strategy

Given the enormous extent of the *Ammophila* invasion on west coast dunes, and the high costs associated with control, prioritization of efforts is essential. Funds should be expended on projects with the greatest ecological return. As with other exotic plant infestations, prevention of expansion into any new, pristine areas is critical. This principle is applicable at both local and regional scales. Region-wide (for the west coast, or a given state), efforts should concentrate on dune systems that have only incipient populations of *Ammophila*. One example of this situation is the Ten Mile dunes in Mendocino County. Although the nearby Manchester dunes were targeted by early dune stabilizers, Ten Mile dunes somehow escaped this plight. *Ammophila* is a relatively recent invader and occupies less than 125 acres of the 1,400-acre dune system. It is now spreading rapidly, and the chance for early intervention is nearly past. A window of opportunity for control of this species will be gone within half a decade. With scarce resources, the recognition of a priority like this at a regional level will help to focus the efforts of the managing agency (in this case, State Parks).

Near the southern limit of the range of *Ammophila,* it is tempting to ignore the species in favor of other more visible exotics such as iceplant *(Carpobrotus edulis*) and veldt grass *(Ehrharta calycina).* The prevailing perception is that *Ammophila* spreads less aggressively south of San Francisco than to the north. However, at the Guadalupe-Nipomo dunes system, (one of the southernmost sites), *Ammophila* now occupies a total of 275 acres and is spreading exponentially through native vegetation, posing a serious threat to rare plants and nesting snowy plovers (Chestnut 1997).

In many California dune systems, multiple landowners and managers, make prioritization difficult. At Humboldt Bay, dune agencies have formed an alliance known as the Dunes Forum in order to set regional restoration priorities and to cooperate in fulfilling them. The Coastal Dunes Guild of the California Chapter, Society of Ecological Restoration, has established an objective to inventory California dune resources carefully, as the first step in setting state-wide priorities. However, funding sources to fulfill this objective have yet to be identified. Until such priorities are set, competition within regions and within agencies for limited resources, as well as inefficient expenditures will continue. Alternatively, with priorities in place, agencies can work together to increase efficiency.

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