City of Cannon Beach Ocean Management Zone Shoreline Protective Structures Review

Introduction

The goal of this report is inform amendments to the City of Cannon Beach's zoning ordinance regulations on shoreline protective structures and their less intensive alternative erosion control methods, particularly "Structural Shoreline Stabilization" and "Non-structural Shoreline Stabilization Programs" as they are referred to in the code.

In recent years, staff and stakeholders observed increasing numbers of permit requests for shoreline protective structures. The City's zoning ordinance regulates SPS to manage their impact on the surrounding area, neighboring properties, and public use of the beach. Stakeholders have noted opportunities for the code to improve in meeting its own stated purpose and relevant plans and goals.

The report summarizes high level trends in the City's shoreline conditions related to erosion, the regulatory framework for SPS, interests of some preliminary stakeholders, alternative approaches used in other jurisdictions, and potential conceptual amendments to the zoning ordinance.

Introduction to SPS

For this report, the term shoreline protective structure has the same meaning as another commonly used term, "beach front protective structure', and shares the definition for that term identified in Oregon's Guidebook on Erosion Control practices for the Oregon Coast[1].

> ""A static structure that is intended to remain in a fixed position with the purpose of redirecting wave energy and to minimize or eliminate coastal erosion risk to development. BPS are purposefully constructed and intended to maintain that form over time. This includes, but is not limited to, rip-rap revetments, seawalls, groins, breakwaters, jetties, bulkheads, geotextile sandbags, sand burritos, gabions, and concrete or mortar reinforcement such as shotcrete. Beachfront protective structures do not include dynamic treatments such as sand nourishment, cobble revetments, and similar non-structural or nonfixed erosion mitigation measures."

Shoreline protective structures can effectively slow long term erosion trends and mitigate erosion damage from large rare storm events, by deflecting wave energy from the property needing protection. The City and State recognize that there are circumstances when SPS are needed, and have provided process for obtaining permits and emergency approvals for SPS.

[1] https://www.oregon.gov/lcd/Publications/guidebook_erosion_control_practices.pdf

The City and State have also recognized that SPS impact adjacent properties, natural resources and ecological functions, and public recreational use of beach areas, among others. For example:

- SPS often occupy 1.5 - 2 ft of beach area for every foot of height.
- SPS restricts beach sand supply (the sand behind the structure that is protected from erosion) that would otherwise be available to nourish surrounding beaches.
- SPS deflect wave energy, some of which becomes redirected at neighboring beaches and properties, which may have their own erosion challenges.
- In depriving the beach of sediment and sand that would otherwise be eroded from behind the structure, and deflecting wave energy back off the structure, SPS have the effect of lowering beach elevations in front of them. The ocean occupies lower beach elevations, resulting in the publicly accessible beach becoming narrower.
- SPS construction processes require heavy machinery to travel on the beach from road access points, occupy beach areas, move sand and materials around, impacting natural resources and public use of the beach.
- SPS may have scenic impacts in introducing geometric forms and foreign materials to the beach environment.

Some of these impacts are also caused by less intensive or less permanent erosion control methods.

Shoreline Environmental and Development Context

Shoreline Conditions

The recently completed Foredune Management Plan and associated reports provide detailed descriptions of shoreline characteristics. Generally, areas north of Haystack Rock have experienced sand accretion, and areas south of Haystack Rock have experienced erosion between 1997 and 2016. Predominant El Niño climate patterns and southerly winds have on the whole caused a northward drift of sand in the Cannon Beach area. The areas listed here have all lost sand since 1997[2]:

- Tolovana North — lost ~4,350 m3 (5,690 yards);
- Tolovana South — lost ~17,500 m3 (22,890 yards);
- Silver Point — lost ~1,660 m3 (2,170 yards);
- Arcadia Beach — lost ~9,670 m3 (12,650 yards);
- Hug Point — lost ~5,070 m3 (6,630 yards); and
- Falcon Cove — lost ~12,800 m3 (16,740 yards).

[2]

Development Trends

Existing and Potential Armoring

While there are already over 2.3 miles of SPS in Cannon Beach, an additional 3 miles of shoreline is probably eligible. Recently, there has been a proliferation of armoring projects in the Tolovana area.

Regulatory Context

Oregon Beach Bill

The 1967 Oregon Beach Bill codified the public's rights to dry sand beaches. This is the basis for OPRD's jurisdiction over beaches, and the basis for land use planning goals and their implementation measures that protect public interests in the beaches.

Goal 16

Statewide Planning Goal 16 guides planning and management of Oregon's estuaries. While SPS are sometimes needed and have impacts in estuaries as they do on beaches, the scope of this report does not address estuarine SPS.

Goal 17

Statewide Planning Goal 17 addresses planning for coastal shorelands. Implemented through local plans and zoning, Goal 17's Implementation Requirement 5 emphasizes "land-use management practices and non-structural solutions to problems of erosion and flooding." This leads to requirements for alternatives analyses, ensuring structural erosion control is only used when necessary.

Goal 18

Statewide Planning Goal 18 is to "conserve, protect, where appropriate develop, and where appropriate restore the resources and benefits of coastal beach and dune areas; and to reduce the hazard to human life and property from natural or man-induced actions associated with these areas." It requires local beach and dune inventories that describe their stability, movement, groundwater resources, hazards, and values, and it requires local policies to manage beaches and dunes.

Goal 18 limits shoreline protective structures to areas where development existed before 1977, essentially capping and limiting the future extent of SPS, while providing further criteria for approving SPS to limit their impact on neighbors and public beaches. These broad criteria include that: (a) visual impacts are minimized; (b) necessary access to the beach is maintained; (c) negative impacts on adjacent property are minimized; and (d) long-term or recurring costs to the public are avoided.

Goal 18 also directs local governments to regulate shore structures and other beach actions to minimize erosion.

> Local governments and state and federal agencies shall regulate actions in beach and dune areas to minimize the resulting erosion. Such actions include, but are not limited to, the destruction of desirable vegetation (including inadvertent destruction by moisture loss or root damage), the exposure of stable and conditionally stable areas to erosion, and construction of shore structures which modify current or wave patterns leading to beach erosion.

OPRD Framework

OPRD has jurisdiction over the "Ocean Shore State Recreation Area," which is the area between extreme low tide and either the statutory vegetation line (ORS 390.770) or current vegetation line, whichever is further inland. OPRD permits shoreline armoring projects, access ways, sand alterations, pipelines, cables, conduits, and natural product removal.

Ocean shore alteration permits require a detailed description of the hazard and the threat it poses to the property, a description of all potential impacts, the proposed dimensions, materials, and construction methods, analysis of alternatives, and for projects greater than 50' in length, a geologic report from a registered professional geologist experienced in coastal processes.

The geologic report must address erosion rates on the subject property and adjacent properties, the project impacts on erosion rates on the subject and adjacent properties; the impacts from the proposed project on sand source, supply and movement on the beach, a review of why nonstructural solutions were unsuccessful or why they were unfeasible, and a review of how the proposed project may affect or be impacted by geologic and seismic hazards.

OPRD permits for SPS must be consistent with local enforceable policies of the Oregon Coastal Zone Management and other state and federal laws. OPRD evaluates the permit with a set of criteria given in OAR 736-020-0010 through 736-020-0030.

- The General Standards (OAR 736-020-0010) require justification for the proposed project based on an evaluation of alternatives, including consideration of how the proposed project and the alternatives protect or impact public rights to access the beach, public costs of remediating projects at the end of their lives, and compliance with other state laws.
- The Scenic Standards (OAR 736-020-0015) require projects to retain and blend in with natural features and materials, including the preservation and restoration of vegetation that may be impacted by the project.
- Recreation Use Standards (OAR 736-020-0020) prohibit projects that would be detrimental to public recreational use of the beach.
- Safety Standards (OAR 736-020-0030) address the structural safety of the SPS, safety implications of any obstruction that SPS may cause to beach users, and safety impacts to neighboring properties.
- The Natural and Cultural Resource Standards (OAR 736-020-0030) require projects to avoid or minimize impacts to fish and wildlife, other estuarine values, navigation,

historic, cultural, and archeological sites air and water quality of the ocean shore area, areas of geologic interest, fossil beds, ancient forest remnants, and native plan communities.

OPRD permits may include conditions such as deed recordation of the permit and conditions, cash bond, and terms for inspection, revegetation, and maintenance.

Emergency permits can be issued for properties in "imminent peril" if they also satisfy the Goal 18 eligibility requirement necessary for the issuance of a typical shore alteration permit.

City of Cannon Beach

City of Cannon Beach regulates preservation grading and SPS through its Foredune Management Plan and Comprehensive Plan, and zoning code.

Comprehensive Plan Beachfront Protective Structures Policies

The City Comprehensive Plan Beachfront protective structures policies on pages 24 and 25 reflect the preference for less impactful stabilization measures over more impactful one, and the general approval criteria from Goal 17, and that are repeated in the City Development Code.

Foredune Management Plan

This Foredune Management Plan[3] implements Goal 18 and is implemented primarily by Chapter 17.42 of the Cannon Beach Municipal Code. It is particularly focused on dune grading and does not refer to SPS. The plan goals are:

1. To ensure the dunes sustain an adequate sand volume in order to withstand the erosional effects of extreme weather and to minimize any potential for wave overtopping and inundation (flooding) of backshore;

2. To strengthen weak points in the dune system by repairing areas subject to localized blowouts from wind or waves in order to prevent the dune buffer from weakening and potentially being breached during a storm;

3. To maintain valuable habitat for a wide range of plants and animals, such as shellfish, including razor clams, and in some cases rare species; and

4. To maintain the integrity and natural beauty of the dunes, while providing for the necessary functions of public access, facilities and utilities

The plan allows for preservation grading, which is sand movement necessary to repair blow-outs, erosion or maintain public access or facilities. Preservation grading may be permitted through a conditional use permit if the area is committed to development and the proposal

[3] City of Cannon Beach Foredune Management Plan

meets the requirements of Comprehensive Plan Foredune Management Policy, and is consistent with the plan goals listed above.

Zoning Ordinance

Chapter 17.42 Oceanfront Management Overlay Zone

Chapter 17.42 Oceanfront Management Overlay Zone specifies uses permitted or conditionally permitted in the Overlay Zone, along with substantive and procedural standards for each use. Structural shoreline stabilization, non-structural shoreline stabilization, and preservation grading may be permitted as conditional use.

Section 17.42.050 includes standards for all uses permitted in the Ocean Front Management Overlay Zone. Section 17.42.060 includes standards specifically for non-structural shoreline stabilization, while referring to specific standards for structural shoreline stabilization contained in Chapter 17.80 on Conditional Uses.

Chapter 17.80 Conditional Uses

Chapter 17.80 Conditional Uses includes procedures and criteria for deciding conditional use permit requests. Section 17.80.230 includes conditional use approval standards for structural shoreline stabilization. This section specifies the prioritization of least intensive solutions closely mirroring the guidance of State Land Use Planning Goal 18.

2. Where riprap, bulkheads or seawalls are proposed as protective measures, evidence shall be provided that high priority methods of erosion control will not work.

E. Qualifications for Beachfront Protection.

1. Structural shoreline stabilization methods for beachfront protection shall be permitted only if:
   a. There is a critical need to protect property that is threatened by erosion hazard;
   b. Impacts on adjacent property are minimized;
   c. Visual impacts are minimized;
   d. Access to the beach is maintained;
   e. Long-term or recurring costs to the public are avoided; and
   f. Riparian vegetation is preserved as much as possible.

Initial Stakeholder Input

To gather initial stakeholder input we interviewed City of Cannon Beach and Friends of the Dunes Staff, and reviewed meeting notes and emails between them and staff from CREST, Surfrider, Oregon Coast Alliance, and DLCD staff. The discussion draft amendments are not yet informed by property owners or qualified professionals who prepare their applications for SPS.

City of Cannon Beach Staff

Staff review SPS applications and write staff reports to the Planning Commission to support their decisions. Staff also administer permit compliance and conditions. Staff have a basic interest in SPS regulations with the following characteristics:

- being internally consistent
- consistent with the comprehensive plan and state laws
- supported by permit fees that pay for the scope of the required review
- have relatively objective standards

Staff went on to identify the following potential issues:

- The zoning code requires a geotechnical or geologic evaluation, but does not specify required the reports' information and conclusions.
- There may be potential gaps between the City Foredune Management Plan and the zoning code.
- The zoning code does not specifically require applicants to use less intensive solutions before using more intensive solutions, or it does not effectively include standards to implement the preference for less intensive solutions.

Friends of the Dunes, Surfrider, Oregon Coast Alliance

- Protective of natural resources and complementary to natural processes
- Generate knowledge that can be used to improve future decisions at the subject property and in the surrounding area and citywide
- Provide opportunities for public comment and appeals
- Meaningful evaluation of alternatives and standards implementing the code's stated preference for less intensive solutions.
- SPS approvals are requested using a conditional use permit application. This application does not prompt applicants and staff to consider the full range of issues expressed in the zoning ordinance and comprehensive plan.
- The permit process does not require sufficient justification from applicants to demonstrate that less intensive solutions are insufficient, and that more impactful solutions are required to manage the hazard.
- The permit process does not require sufficient justification from applicants that interventions of any kind are required to manage the hazard.
- Small cities do not employ coastal geomorphologists and geotechnical engineers, so in-house staff don't have all of the expertise needed to evaluate applicant's reports. The City probably does not charge sufficient permit fees to support a city consultant review.
- The permit process effectively does not require applicants to follow through on SPS performance reporting requirements.
- The permit process effectively does not have meaningful enforcement mechanisms for applicants that deviate from the work described in their permits, or from the reporting requirements.

- The zoning ordinance does not reflect forecasted flood hazards in a changing climate.
- The zoning ordinance does not require collecting the kind of information needed to track the performance of interventions.

Notable Practices

While there are no comprehensive best practices guides for Oregon local governments on regulating shoreline protective structures and their less-intensive alternatives, some communities and states have produced guidelines and regulations that illustrate a broader range of strategies.

Guidebook on Erosion Control Practices of the Oregon Coast

The Guidebook on Erosion Control Practices of the Oregon Coast[4] explains the legal framework for regulating shoreline protective structures and less intensive alternatives in Oregon. The Guidebook also provides introductory information on the performance and limitations of over a dozen erosion control practices, including a qualitative assessment of how each practice may perform with rising sea levels.

Tillamook County

A Dune Area Development Permit is required for any new development, new construction, substantial improvement, shoreline alteration or grading activity in the Beach and Dune Overlay Zone[5]. The Dune Area Development Permit requirements emphasize the importance of a comprehensive and detailed report prepared by qualified professionals. For example, the report must show the engineering work, refer to the generally accepted standards upon which it based, quantify expected erosion rates, quantity a variety of impacts to surrounding areas, evaluate each of a series of alternative approaches. The qualified professionals who prepare the report must then certify that any building or engineering plans are consistent with the recommendations of the report, that their inspections of the actual work performed are consistent with the recommendations of the repot, and finally that monitoring, vegetation stabilization and other maintenance measures are being implemented consistent with the recommendations of the report. Notably Tillamook County issues Dune Area Development Permits as a Type 1 administrative procedure and does not require a Dune Area Development Permit for beachfront protective structures regulated by OPRD under OAR 736-020.

Washington Shoreline Management Act

[4] Guidebook on Erosion Control Practices of the Oregon Coast

[5] Tillamook County Beach and Dune Overlay Zone

The Washington Shoreline Management Act and its state implementing regulations and locally adopted shoreline master programs offers some alternative perspectives on regulating shoreline erosion control measures. Conditional use permits are typically not required for new SPS that will protect an existing single-family home. Local regulations require a geotechnical report that demonstrates a need for SPS, that the SPS employed is the least impactful solution available, that the extent of the SPS is the minimum necessary, and that the SPS occur at or landward of the ordinary high-water mark.

Draft Amendments

Discussion draft code amendments will focus on improving the information in permit applications, improve the approval criteria, and improve reporting requirements to more meaningfully implement the City's preference for least intensive solutions and to create a framework for owners, their consultants, staff, and planning commissioners to understand a more complete range of options, issues, and prior successes and failures while considering permit decisions.

Under the discussion draft amendments applicants and the City will continue to rely on the expert analyses of the applicants' consultants to describe conditions, hazards, solutions, and impacts, however the amendments require more specific information from those experts to show their work, justify their conclusions, and create a record that can be used to inform better decisions on individual applications, administrative practices, and future code amendments.

While the City's development code is acknowledged, and the new Foredune Management Plan does not appear to include new policies directed at structural shoreline stabilization and non-structural shoreline stabilization programs, the discussion draft code amendments can be seen as a step towards more completely fulfilling the following Statewide Land Use Planning Goal 17 and 18 elements.

> Goal 17 Implementation Requirement #5: Land-use management practices and non-structural solutions to problems of erosion and flooding shall be preferred to structural solutions. Where shown to be necessary, water and erosion control structures, such as jetties, bulkheads, seawalls, and similar protective structures; and fill, whether located in the waterways or on shorelands above ordinary high-water mark, shall be designed to minimize adverse impacts on water currents, erosion, and accretion patterns.
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> Goal 18 Implementation Requirement #3: Local governments and state and federal agencies shall regulate actions in beach and dune areas to minimize the resulting erosion. Such actions include, but are not limited to, the destruction of desirable vegetation (including inadvertent destruction by moisture loss or root damage), the exposure of stable and conditionally stable areas to erosion, and construction of shore structures which modify current or wave patterns leading to beach erosion.
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> Goal 18 Implementation Requirement #5: 5. …The criteria for review of all shore and beachfront protective structures shall provide that: (a) visual impacts are minimized; (b) necessary access to the beach is maintained; (c) negative impacts on adjacent property are minimized; and (d) long-term or recurring costs to the public are avoided.

Chapter 17.42 OCEANFRONT MANAGEMENT OVERLAY (OM) ZONE draft amendments primarily add to the monitoring and reporting requirements for nonstructural shoreline stabilization programs. They relate to draft amendments on structural shoreline stabilization, encouraging applicants to meaningfully use and report on the outcomes of non-structural shoreline stabilization programs before applying to use structural stabilization methods.

Chapter 17.50 DEVELOPMENT REQUIREMENTS FOR POTENTIAL GEOLOGIC HAZARD AREAS draft amendments add to the geologic investigation report requirements for coast adjacent projects, specifying more details, evaluations and conclusions that must be made in the reports.

17.80.230 Shoreline stabilization draft amendments add requirements to implement the existing stated preference for less impactful stabilization methods, add an impact minimization criterion for ecological values, and adds monitoring and reporting requirements. The draft amendments also add a requirement that riprap installed under an emergency authorization follow a similar approval process as other structural stabilization projects (except that the process will occur after installation) and consider alternative methods for modifying the installation to minimize its impacts.

Forms and Fees

Given the extent of the information required of applicants, and that the applicant's qualified professional needs to customize it to each property in a Geologic Site Investigation Repot, an application form that prompts applicants for all of this information would be very long. Instead, the City may consider creating an application checklist of components that would comprise a typical complete application packet and that prompts applicants to consider some important questions that might not otherwise receive sufficient attention given that they will be new requirements and that they will be included among a relatively long list of other requirements.

If the City wants to enable analysis of multiple projects and project outcomes across time and the City's geography without bespoke data collection and processing from written reports for occasional analysis projects, a more substantial effort would be needed to set up a process for collecting and processing data as it is submitted in applications and the annual reports described in the draft amendments. The City may consider using electronic forms and GIS data submittal requirements to collect key quantitative performance metrics over time, such as the width of the beach in front of a proposed structure. Given the preliminary nature of the draft amendments, and that digital or paper application forms will be based on the ultimate adopted code amendments, more input is needed on the draft amendments and broader research and analysis interests.

The discussion draft amendments propose two new bonding requirements that would fund the City's assumption of some applicant responsibilities in the event that applicants do not complete them. The City's posted fee schedules indicate a $750 fee for a conditional use permit application and building permit fees. The posted fee schedules do not indicate any fees oriented to funding staff or consultant resources for reviewing geological site investigation reports, or for understanding and monitoring the projects that they inform. The City may also consider

reviewing its fees associated with shoreline stabilization projects to ensure that the City has adequate staff and consultant resources to understand stabilization projects as they are proposed and implemented.

Next Steps

The current iteration of this report and associated draft amendments is a first draft for discussion purposes with the stakeholders that requested assistance. Following their review and edits, additional stakeholder input will be needed to ensure that the draft amendments employ a broader range of local and expert knowledge.

The draft amendments considered here are intended to be part of a larger City development code revision process, that includes a reorganization of the code. The City's consultant for that larger project is in the process of proposing reorganization of the development code in Summer 2023.

With additional feedback from the initial stakeholders, and the initial results of the City's proposed code reorganization, the draft amendments can be revised and prepared for a broader audience.

References

Bond, Haily. Guidebook to Erosion Control Practices on the Oregon Coast. Department of Land Conservation and Development. 2022. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.oregon.gov/lcd/Publications/guidebook_erosion_control_practices.pdf

Oregon Coastal Atlas. 2023. https://www.coastalatlas.net/oceanshores/

City of Cannon Beach Comprehensive Plan

City of Cannon Beach Foredune Management Plan

City of Cannon Beach Zoning Ordinance

City of Cannon Beach Land Use Fee Schedule