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## Grant Application Cover Sheet

Please complete the following coversheet. See the grant application guidelines on our website [www.myowf.org/grants](http://www.myowf.org/grants) to complete your application. Volunteer organizations without nonprofit status must have a tax-exempt fiscal sponsor. You may scan and email this cover sheet and your application.

### About You

- 1 Project Title: Exploring foredune restoration strategies with native vegetation to guide management practices on the Oregon coast
- 2 Organization: Oregon State University
- 3 volunteer organizations without nonprofit status, list your fiscal sponsor:
- 4 Tax id number (not required for governmental applicants): 61-1730890
- 5 Project Manager Name: Meagan Wengrove Title: Assistant Professor of Coastal Engineering
- 6 City: Corvallis, OR Address: 101 Kearney Hall, Oregon State University Zip Code: 97331
- 7 Phone (office): (541)-737-8813 Phone (mobile): (303)-895-7077 email: meagan.wengrove@oregonstate.edu
- 8 Tell us about yourself (brief biographical statement): I am an assistant professor at Oregon State University in the School of Civil and Construction Engineering. I am a coastal engineer and my research area focus is on adapting coastal engineering to promote natural and nature based features and systems (dunes, marshes) instead of man made structures (sea walls, revetments). The proposed project to OWF is part of a larger Oregon Sea Grant project that was funded to understand how we can promote the use of native dune vegetation instead of invasive species for dune restoration and stabilization along the coast. This is an important coastal engineering problem because the dune vegetation species have strong feedbacks to the dune shape.
- 9 Have you applied for a grant from Oregon Wildlife Foundation before? Yes  No
- 10 If "yes", what was the name of the project?

### About Your Proposed Project

- 11 What type of project are you proposing? Fish  Wildlife  Other
- 12 Will it address an Oregon Conservation Strategy habitat or species? Yes  No   
If "yes", please name the habitat and/or species addressed: coastal dunes
- 13 Proposed start date: 1 January 2021 Anticipated end date: 31 December 2021
- 14 Project Location (attach map): Nehalem Bay State Park, Oregon Nearest town or city: Brighton, OR County: Tillamook County
- 15 Has a local, state, or federal biologist reviewed this project? Yes  No   
If "yes", what is their name? Cheryl Strong Phone: (541)-786-3648 email: cheryl\_strong@fws.gov
- 16 If "no", what is your plan for an external review of the project?
- 17 Estimated project cost: \$25,000 Funding you are requesting: \$5,000
- 18 How will you use the requested funds? OWF funds will be used to support green house costs to grow native plants and contractor costs to help plant plants at the pilot study location. What will you accomplish (ex., stream miles enhanced, acres planted? We will accomplish a pilot study for the use of native Oregon dune grasses and forbes for dune restoration along the Oregon coast. The pilot project is not large (200 m x 20 m), but will have a large impact. It's focus is to change restoration management requirements to incorporate native dune plants when replanting dunes instead of continuing to replant with invasive species (current standard practice) along the Oregon coast.
- 19



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20 Check the following box to be added to our email distribution list:

**Project Abstract/Summary**

21 Limited to 750 characters. *Do not begin your narrative here or link to other pages:* The proposed project is to perform a pilot study using native Oregon beach dune vegetation (instead of invasive species) for restoration practices along the Oregon coast. The established practice for dune stabilization along the Oregon coast dates back over 100 years, and uses invasive grasses (mainly European Beach Grass). European Beach Grass grows so densely that it effectively squeezes Snowy Plover populations and native vegetation species out of the ecosystem, limiting eco-diversity. The Oregon Parks and Recreation Department has the goal to encourage the use of native vegetation for future projects. The pilot study will focus on understanding how to most effectively use native species for dune restoration.

**Certifications**

- 22  Check here to certify that you have already or will obtain necessary permits from all requisite agencies *as applicable to the proposed project.*
- 23  I have included pre-project pictures or video as well as a picture or video entry of myself.
- 24  I understand that I'm required to submit a Project Completion Report, copies of any publications or social media posts crediting the Foundation's support, and post-project pictures at the completion of my project.
- 25  I warrant that I am the legal owner of all pictures and video submitted in application and grant permission for the Foundation to reproduce, exhibit, or publish them for all general purposes in relation to Oregon Wildlife Foundation's work.
- 26 Signature of Applicant or Authorizing Official: Michelle Warf

F0BDF77D7804488  
Acting for Tuba Ozkan-Haller  
Associate VP for Research & Development  
8/6/2020 | 15:55:26 PDT

## Exploring foredune restoration strategies with native grasses to guide management practices on the Oregon coast

**Project Summary:** The proposed project is to perform a pilot study using native Oregon beach dune vegetation (instead of invasive species) for restoration practices along the Oregon coast. The pilot project is being performed by the Oregon Parks and Recreation Department (OPRD) in collaboration with Oregon State University (OSU). The established practice for dune stabilization along the Oregon coast dates back over 100 years, and uses invasive grasses (mainly European Beach Grass). European Beach Grass grows so densely that it effectively squeezes Snowy Plover populations (endangered bird) and native vegetation species out of the ecosystem, limiting eco-diversity. OPRD is the permitting party for dune restoration and stabilization in Oregon for both ocean views projects as well as habitat restoration projects. *OPRD has the goal to encourage the use of native vegetation instead of use of European Beach Grass for future projects.* The pilot project will work on a 200 m x 20 m section of a graded dune in Nehalem Beach State Park, the pilot is not a large land area, but will have a significant impact on future restoration projects. We will test 8 treatments of various mixes of dune vegetation to understand how to optimally encourage native ecodiversity in a dune system that has been dominated by invasive species for decades.

**Why OWF?** OPRD and OSU would like to reach out to OWF because our project was impacted by the COVID-19 economic setback. OPRD had budget to fund the pilot restoration campaign, but due to COVID-19, no longer can support the pilot component monetarily, although they are still actively engaged as partners (see letter of support). To complete the pilot project, we are looking for a total contribution of \$25,000. We are reaching out to OWF for \$5,000 of the needed budget and we are working to accumulate funds from many different sources including other foundations and federal agencies. OSU was funded by Oregon Sea Grant to preform the research, monitoring, and synthesis components of this project, as a match for OWF funds we are re-budgeting a portion of the Sea Grant project funds for planting (at least \$5,000). The funds from OWF will be used to hire a set of contractors for dune planting costs at the restoration site at Nehalem Spit, Oregon. Oregon Sea Grant will be funding (\$230,000) all of the research aspects of the proposed work and for creating an Oregon Dune Management Booklet that can disseminate knowledge (<https://seagrant.oregonstate.edu/research/current-research>). The \$230,000 includes graduate student pay and tuition, supplies and instruments for monitoring, funds for the dune booklet, and costs for university overhead.

**Justification and Alignment with OWF Mission:** The Oregon Wildlife Foundation works to protect, maintain, and enhance fish and wildlife resources in Oregon. Unfortunately, about 100 years ago the Oregon coastal dunes were planted with two species of invasive grasses (European Beach Grass and American Beach Grass). Our project is working to understand the best practices for reincorporating the ecodiversity of native grasses back into our coastal dune system in both dune systems managed for habitat conservation as well as dune systems managed for human recreation. Our proposed work aligns closely with the “projects that fall within ‘wildlife habitat restoration,’ ‘public area restoration or improvement,’ and ‘invasive species control’” thematic areas. Additionally, with our Oregon Dune Management Booklet, which will incorporate perspectives of all dune users along the coast, the project also aligns with the ‘natural resource or outdoor education’ thematic area. Our project will investigate

sustainable solutions for dune stabilization using vegetation in response to the needs of coastal residents. Our research will determine how beachgrasses and native plants can be replanted to stabilize foredunes and address community-driven demand while maintaining healthy ecosystems. In collaboration with Oregon coastal partners, we will work to understand the physics and ecology of different management scenarios and then apply that knowledge to communicate strategies using the proposed Oregon Dune Management Booklet.

***Anticipated Benefits:*** The goal of the pilot project is to lead to a new way of managing the Oregon coastal dune system by encouraging and even requiring the use of native vegetation in Oregon dune management planting practice in the future. By incorporating native species now, we will be able to re-gain ecodiversity of the Oregon dunes over time. These learnings will be communicated broadly through the Oregon Dune Management Booklet (described in the Oregon Dune Management Booklet section). See letters of support from both OPRD and the Oregon Coastal Management Program for the described benefits.

***Project Outcomes, Likelihood of Success, and Significance at State Level:*** It is highly likely that the pilot project will be successful and lead to requirements at the Oregon state level for incorporating native vegetation in to dune planting and restoration practices. The OPRD is the manager of the Oregon coastal dunes as set forth by Oregon's Habitat Conservation Planning document. Trevor Taylor, who is the Oregon Stewardship Manager for OPRD, has been advocating for this type of pilot project for several years. The management applications for the proposed work were co-developed with the OPRD, and are an explicit interest of the management agency. OPRD would like to develop management practices that consciously incorporate native flora in both graded dunes for views and in habitat restoration areas. Because many of Oregon's foredunes are vegetated by invasive species, our agency is looking to: 1) develop a mix of native dune species that will be successful for restoring foredune natural habitat including attracting the Western snowy plover, and 2) develop a mix of native dune species that will be successful for stabilizing sand in foredunes near coastal roads, homes, and businesses to avoid sand inundation scenarios. While OPRD is currently in a budget crunch due to COVID-19, they still have four staff working with us to make sure the pilot project is a success. Additionally, since they are a regulator for the Oregon coastal dunes, they have the capacity to change Oregon state management requirements. Oregon's conservation mindset, and state employees that advocate for ecodiversity further ensure that into the future, learnings from this pilot project will be incorporated into future restoration.

***Outline of Project Goals, Project Need, & Background on Dune Management in Oregon:***

Coastal foredunes are often a first line of defense against the impact of coastal storms and inundation for both natural habitats and built communities and at the same time they provide habitat to a diverse set of species and a place for human recreation (Barbier et al. 2011). Humans have increasingly engrained themselves to be a part of dune ecosystems, shifting natural coastal processes to include the human dimension. Coastal infrastructure, shoreline hardening, and recreational activities all influence the way our beaches and dunes evolve (Lithgow et al. 2014). Coastal managers must contend with balancing natural processes with the safety, needs, and well-being of coastal communities. The Oregon coast consists predominantly of unmanaged foredunes occupied by invasive beachgrasses, with a smaller fraction of foredunes heavily managed for human benefits near population centers on the north and central coasts of Oregon, and reclaimed foredunes for native species in unpopulated regions in

the north and south coasts of Oregon (Figure 1). The geomorphological (the relationship between the physical features and geological structure of an area) and ecological evolution of unmanaged foredunes populated by invasive beachgrasses is reasonably well understood (e.g., Hacker et al. 2012, Zarnetske et al. 2015, Ruggiero et al. 2018, Cohn et al. 2019 a,b, Biel et al. 2019). However, the evolution of managed and reclaimed foredunes is largely unstudied (Lithgow et al. 2013). In Oregon, there is an expressed need for this specific knowledge of best practices for Oregon coastal dune management. Coastal counties in the north and central coasts are predicted to see an 8% population increase by 2040, and managers want to be prepared for maintaining human interests as well as ecological benefits in Oregon foredunes. In the words of our management partners, Oregon Stewardship Manager Trevor Taylor, Ocean Shores Permit Coordinator Jay Sennewald (Oregon Parks and Recreation Department [OPRD]) and Oregon Coastal Shores Specialist Meg Reed (Oregon’s Coastal Management Program [OCMP]), *“we need up to date knowledge of best management practices for foredune stabilization”* and *“we need unbiased and non-governance affiliated information on foredune best management practices to guide Oregon coastal residence when making private dune management decisions.”*



**Figure 1:** Present day Oregon foredune archetypes: unmanaged (left), managed dune for human benefit (FMHB) (middle), managed Habitat Restoration Area (HRA) (right).

***To address our management partner needs, we are funded by Oregon Sea Grant to complete a study that will follow the evolution of Oregon foredune geomorphology from the small to the large scale in the context of foredune management practices. We will quantify both invasive and native dune plant sand trapping capacity as a function of plant maturity, starting from initial management scenario configurations (species diversity) through the first two years of growth. We will develop fundamental insights into coastal dune behavior and will provide science-based foredune management guidance for the state of Oregon via a community-accessible Oregon Dune Management Booklet.***

Managed foredunes refer to foredunes that are managed for human benefit (FMHB). FMHBs are graded and replanted with (mainly invasive) beachgrasses to improve viewsheds for homes and business (Figure 1) and to increase capacity for home and business accessibility. Reclaimed foredunes, or habitat reclamation areas (HRAs), refer to foredune systems where all invasive beachgrasses are typically removed. HRA management practices include deeply grading the dunes or using herbicides to remove all invasive species, grasses are not replanted so that native flora and fauna can take advantage of the highly dynamic sandy landscape. The evolution of and best practices for implementing managed and reclaimed foredunes is highly important to the wellbeing of both coastal cities (FMHBs) and coastal native species (HRAs).

At present, the most up to date resource for foredune management planning in Oregon is the

30-year-old Oregon Dune Management Planning document (Oregon DLCD, 1989), which is a guide that county planners can use to form their own dune management plans. The document is in fact older than most of the cumulative knowledge about Oregon foredune evolution antecedent to our proposed research project. Our proposed project is built on a platform of existing knowledge collected within the past 10 years that has documented how unmanaged foredunes in the Pacific Northwest evolved to their present form (see Ruggiero et al. 2018 for review of a present knowledge). Oregon field-based studies have shown that Pacific Northwest foredune geomorphology is, in particular, a function of the dominant plant species and beach width (Hacker et al. 2012, Biel et al. 2019). In the lab, studies have shown which plant species are most effective at trapping sand, how sand trapping is a function of plant density, and the manner in which mixed plant species tend to facilitate or compete with each other (Zarnetske et al. 2012, Hesp et al. 2019). We have used this existing body of work on coastal dunes and the explicit need of our Oregon dune management partners to identify a knowledge gap. *There are no existing studies that document how the influence of dune vegetation and geomorphology on each other change as a function of plant growth and corresponding foredune evolution in the context of dune management practice (e.g., plant species) on the Pacific coast.* Can we tailor dune management to site specific needs along the Oregon coast? For example, to facilitate native Oregon habitat, we manage our dunes by removing invasive grasses to ensure a dynamic dune ecosystem. But what if homeowners want viewsheds and stable foredunes, could they replant foredunes to allow them to be low and stable? Or if a dune is instead intended for coastal protection, what are the best plant species assemblages to encourage tall and wide foredunes? Oregon managers and coastal residents also want to know how dunes evolve with native plant instead of invasive grass (standard practice) restoration. Each management question is relevant to Oregon as well as other parts of the U.S. We have designed an experimental plan to explore foredune evolution in the context of management practices and within the context of Oregon Statewide Planning Goal 18.

**Project Goals:** Our project will:

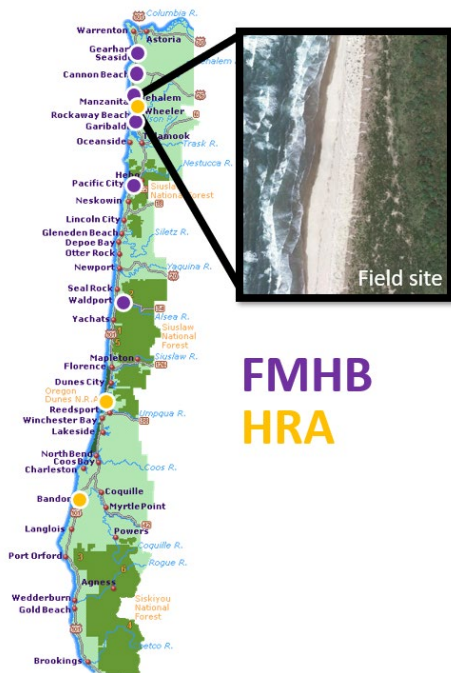
1. Quantify the ecomorphodynamic feedback mechanisms that control foredune stability by means of sand trapping capacity of vegetation in the context of best management practice strategies with respect to species diversity.
2. Quantify the geomorphic evolution of Oregon FMBH and HRA foredunes using field surveys and numerical modeling.
3. Engage with coastal management agencies (e.g., Oregon Parks and Recreation Department (OPRD), Oregon's Coastal Management Program (OCMP)) and local city and county planners to develop an Oregon Dune Management Booklet.

We will use an integrative approach of observations, manipulative experiments, and numerical modeling to understand how dune management practices influence foredune geomorphology and work with coastal managers to develop best practices for managed Oregon foredunes. Throughout the project, we will engage our stakeholder networks in the design of management scenarios that best represent their needs with regard to coastal protection and management of foredunes. We will also engage with Oregon communities faced with FMHBs to align the Oregon Dune Management Booklet with their needs and knowledge base.

## Research Work Plan

The OPRD and OCMP have been looking to quantify how well beachgrasses, especially native plants, can trap sand and therefore stabilize foredunes under dune management practices in both FMBHs and HRAs. Our proposed research is centered on addressing the needs of our management partners, while advancing our applied scientific understanding of how coastal dunes evolve in the context of dune management practices. We propose a combination of manipulative experiments, monitoring, modeling, and creating of an Oregon Dune Management Booklet.

Logistically, OPRD has planned experiments for dune restoration practices; the proposed work will partner with OPRD. OPRD has already graded 26 acres of Nehalem Bay State Park for HRA purposes, and is planning to plant that area with a combination of native plants to promote Snowy Plover habitat. OPRD has all the necessary permits for planting in the HRA and will issue M. Wengrove et al. a scientific permit for the proposed work.



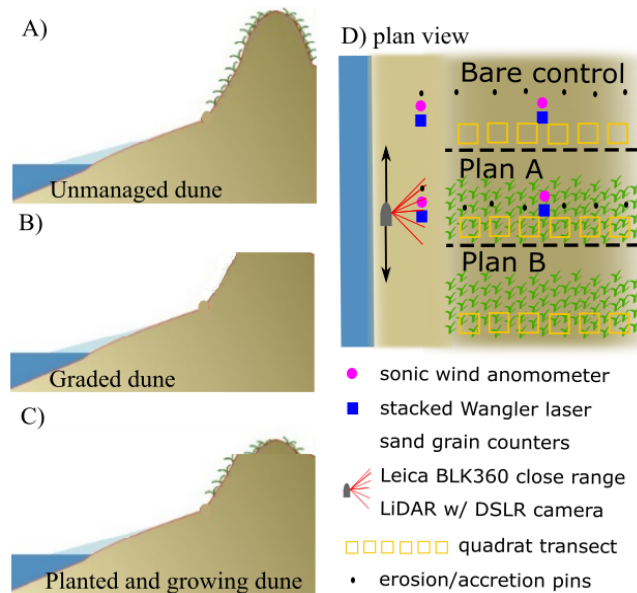
**Figure 3:** Manipulation site locations on the Oregon coast. FMHBs are current foredune grading sites in coastal communities that are graded for human benefit. HRAs are current foredune grading sites for habitat

**Manipulation Plan:** Our research will manipulate a field site at Nehalem Bay State Park in partnership with OPRD with experiments to quantify how different dune plants trap sand in the context of dune management scenarios (Figure 2). At Nehalem Bay State Park field manipulations will be done with a mix of native plants and some invasive plants to understand the dynamics between the species in the context of the present state of the Oregon coastal dunes. OPRD is keen to partner with us at OSU to develop a native planting protocol that, if effective, could become the new standard for FMBH sties. The graded foredune will be planted from its toe (seaward side) to its crest to its heel (shoreward side) with each planting treatment in 15 m alongshore distances, enough to have 3 transect replicates spaced 3 m apart for ecological and geomorphic profile monitoring (Figure 3). For each site there will be a bare control dune section, and the subsequent treatments will vary the planting mix of species. A subset of plants will be set aside to make initial morphological and biomass measurements that can be compared to final measurements (see below). The experiment will inform guidance on best practices for replanting beachgrasses in Oregon FMHBs and near Oregon HRAs. The experiments will inform us of the feedback mechanisms

between wind, sand, and vegetation evolution in the context of dune management practice from the time plants are planted to full grown, which will improve process based models that are used to predict coastal evolution in management contexts.

**Monitoring Plan:** Monitoring will include intensive field surveys during windy conditions approximately four times per year for a week at a time to understand the effects of seasonality on the ability of the vegetation to trap sand. Each planted strip will be instrumented with wind

anemometers used to measure the wind velocity and direction, instruments to measure sediment mobility, and camera and lidar instruments to measure changes in dune morphology.



**Figure 3:** Foredune manipulations outline. A-C) profile view of an unmanaged Oregon dune, a graded dune, and a newly planted and growing vegetated dune, respectively. The evolution of the planted dune shape is expected to be dependent on the plant species. D) plan view of example foredune manipulations and example instrumentation and data collection setup for monitoring. The dashed lines indicate the boundaries for each manipulation outlined (there will be a total of 7 manipulations with 3 replicates each). Each manipulation is 15 m in the alongshore length and extends from the dune toe to crest to heel in the cross-shore direction.

**Oregon Dune Management Booklet:** In partnership with OPRD and OCMF as part of this project we will develop an Oregon Dune Management Booklet to coach stakeholders through the dune management process. There are six Oregon communities that currently have chronic foredune management problems, each with increasing populations (expected 8% by 2040). Each of the six communities have foredune management plans that require them to plant graded dunes with invasive beachgrasses. Dune grading is done to eliminate sand inundation and for ocean views. We will work together with our coastal management partners to find a solution that will help address their needs. The Oregon Dune Management Booklet will focus on best practices for replanting foredunes using both the invasive grasses and a mix of native plants from Project Goal 1. OPRD wants to understand if there is a mix of native plants that could do an equally effective job at stabilizing foredunes compared to the invasive, and residents of Oregon are also passionate about keeping Oregon wild, which includes promoting native plants. The booklet will provide results from our experiments showing the effectiveness of planting with alternative native plants instead of the invasive grasses. The booklet will also have information about how dunes grow and change naturally and under management scenarios as well as tools and tips that communities can use to monitor their dune evolution and health of the replanted beachgrasses. The booklet will be modeled after a project supported by the North Carolina Sea Grant program ([ncseagrant.ncsu.edu/ncseagrant\\_docs/products/2000s/dune\\_book.pdf](http://ncseagrant.ncsu.edu/ncseagrant_docs/products/2000s/dune_book.pdf)) and the New Jersey Sea Grant consortium ([njseagrant.org/wp-content/uploads/2016/07/Dune-Manual-Pgs-compressed.pdf](http://njseagrant.org/wp-content/uploads/2016/07/Dune-Manual-Pgs-compressed.pdf)), which were very successful. Outreach and engagement surrounding the third project goal are discussed in the Outreach and Engagement Plan section.

**Societal Relevance and Community and Management Needs:** OPRD needs an effective method to communicate best practices for FMBH management and has interest to understand how well native plants stabilize dunes in hopes to revert Oregon dune ecology back to native species, each of which our project addresses. Additionally, OCMF is currently working to allocate



funding to update the Oregon Dune Management Planning document with the “best available science” – Meg Reed, OCOMP. The planning document guides Oregon coastal communities through making their own foredune management plans. The document is effective at giving useful guidance for graded foredune shape and volume requirements, but lacks guidance for how to effectively stabilize a graded foredune even though it is Oregon state law that graded foredunes must be stabilized and that communities wishing to grade their dunes must have a dune management plan. Oregon communities have looked to other dune management plans from the east coast of the U.S. for guidance, but plant species, erosion conditions, and sediments are all very different in east coast systems. *In Oregon there is not information on best practices for foredune management including addressing both invasive and native dune plants efficiency at trapping sand, the density of plants needed, and planting pattern, each of which our project will address. Management partners have explicit interest in our project outcomes and helped to co-develop the project goals.*

***Partners and Management Plan during and Post Pilot Project Tenure:***

***Direct:*** Oregon State University (R1 research and educational institution), Oregon Parks and Recreation Department (manager of Oregon coastal dune system), Oregon Coastal Management Program (resource for Oregon coastal planning). During the project period (2021-2023) the project will be managed by Oregon State University and the Oregon Parks and Recreation Department. After the tenure of the project, the pilot site will go back to being part of the Nehalem Spit Habitat Restoration Area for snowy plovers and will be continued to be managed by the Oregon Parks and Recreation Department as per Habitat Conservation Plan.

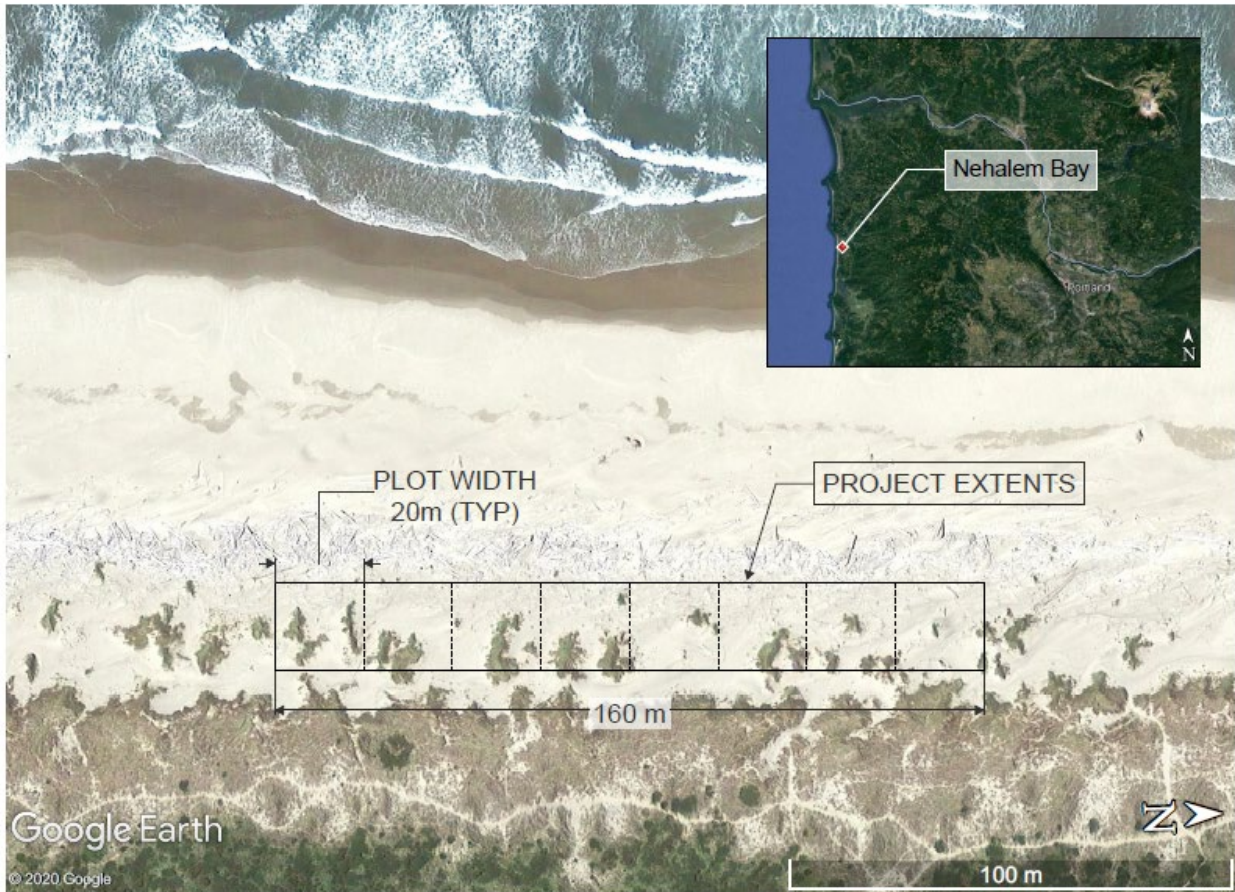
***Indirect:*** As part of our award we will be organizing an Oregon Dunes workshop that will incorporate those who work in dune politics and conservation along the Oregon coast, this workshop will additionally include DOGAMI, TNC, Siuslaw National Forest, the Oregon coastal planners, Tribes, community members, and others who we come in contact with along the way. We would be happy to invite OWF to our workshop if members are interested.

***OWF Recognition:*** OWF will be recognized for its support in the acknowledgements of the Oregon Dunes Management Booklet and on its back cover and during any and all conference presentations and journal publications. We will also be posting signs at the pilot site as information for people wandering by the site about the project and its goals, we will acknowledge both Oregon Sea Grant and the OWF on these signs.

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## Additional Attachment 1: Nehalem Spit Pilot Project Site



The dashed boxes show where the planting experiment will be located on the beach. Each plot will be planted with a different mix of species so that we can understand the influence of planting mix on dune morphology over time.



Nehalem Spit, OR restoration area pre-project photo. Ocean is to the left, dunes are pictured in the middle and to the right.

## Additional Attachment 2: Oregon State University Personnel

Our project team consists of 3 faculty members, 2 graduate students, and a high school student at Oregon State University. Outside of Oregon State University we are working with environmental specialists, biologists, and ecologists at the Oregon Parks and Recreation Department as well as a coastal shores specialist and the team of coastal planners that she works with at the Oregon Coastal Management program. It really takes a team to make change to promote conservation. Below are a photo and bio sketch of the three faculty members working on this project who are integrating coastal engineering, ecology, and coastal geomorphology to address coastal dune management questions.



Meagan Wengrove, Ph.D.  
Assistant Professor  
Coastal Engineer

This is me, Meagan Wengrove. I am an assistant professor at Oregon State University in the School of Civil and Construction Engineering. I am a coastal engineer and my research area focus is on adapting coastal engineering to promote natural and nature based features and systems (dunes, marshes) instead of man made structures (sea walls, revetments) and studying the physics of natural and nature based features in the coastal environment. Some of my current projects focus on the most effective method to design a marsh restoration sill to encourage continued support to vegetation as we adapt to Sea Level Rise; understanding the mechanism of beach dune erosion during extreme storms and natural ways that we can support beach dunes during storms with vegetation and biocementation; and this project, which focuses on using native Oregon plants to restore the Oregon coastal dunes and their capacity for trapping sand and changing dune morphology.



Sally Hacker, Ph.D.  
Professor  
Ecologist

Sally Hacker is an ecologist who has studied dune grasses and their influence on dune morphology for 20 years. She is interested in both managed and natural coastal communities. She is interested in species interactions and how they influence the structure, function, and services of communities. Her research investigates the magnitude and importance of native and non-native species interactions on community structure and function.



Peter Ruggiero, Ph.D.  
Professor  
Geomorphologist

Peter Ruggiero is a coastal geomorphologist who has studied beach dunes for 15 years. His research has discovered the controlling mechanisms on Oregon beach dune height and width. He focuses on nearshore morphodynamics, modeling coastal evolution, and large-scale coastal behavior.



Your budget should detail sources of support and expenses for your proposed project. Please do not use any format other than the one provided here. Instructions have been inserted as notes; put your cursor over the marked cell to read.

Project Budget			
Project Revenue	Cash	In-Kind	Committed/Pending
<i>Oregon Wildlife Foundation request</i> →	\$5,000.00		Pending
Oregon Sea Grant, as matching funds	\$5,000.00		Committed
All OSU personnel costs are in kind or covered by Oregon Sea Grant, and all OPRD personnel costs are in kind (none included in project cost estimate).			Committed
<b>revenues</b>	\$10,000.00	\$0.00	
<b>Total Project Support</b>			\$ 10,000.00
<b>Project Expenses</b>			<b>Amount</b>
Contractor costs for planting pilot plants and moving plants to site			\$10,000.00
<b>Total Project Expenses</b>			\$10,000.00
<i>Balanced budget? This cell should read "\$0.00" →</i>			\$0.00



# Oregon

Kate Brown, Governor

## Parks and Recreation Department

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[www.oregonstateparks.org](http://www.oregonstateparks.org)



August 5, 2020

Dr. Meagan Wengrove, Assistant Professor  
Civil and Construction Engineering  
Oregon State University  
1491 SW Campus Way  
Corvallis, OR 97331

Dear Dr. Wengrove,

I am writing to support your proposal to the Oregon Wildlife Foundation entitled “Exploring foredune restoration strategies with native vegetation to guide management practices on the Oregon coast.” The proposed effort will help fill data gaps in foredune management techniques for both foredunes heavily used by coastal communities as well as those in restored habitat areas. The management applications for the proposed work were co-developed with Oregon Parks and Recreation Department (OPRD), the state agency charged with management of Oregon’s beaches. The information we hope to gain from this project are an explicit interest of our management agency.

OPRD would like to develop management practices that consciously incorporate native flora in both dunes graded on private property and in managed natural areas, such as habitat restoration areas. Many of Oregon’s foredunes are vegetated by invasive species, therefore, our agency is looking to: 1) develop a mix of native species that will be successful for restoring foredune natural habitat including attracting the western snowy plover, and 2) develop a mix of native dune species that will be successful for stabilizing sand in foredunes near coastal roads, homes, and businesses to avoid sand inundation. While it may be necessary to include non-native species in the mix, it will be beneficial to put science behind management decisions and guide homeowners through available best management practices for planting in Oregon’s foredunes. The Oregon Dune Management booklet developed from this project will be specifically formulated for Oregon dunes, which are different than other dune systems in the U.S. because of heavy sand supply. It will be a resource to our management needs internally, but also for Oregon’s coastal county and city planners, and for the public. We are excited to partner with you on the proposed research to investigate the stabilizing capacity of Oregon’s native dune plants.

As we move past this pilot project, we will use the information to make Oregon’s coastal dunes more ecologically diverse. We will encourage the incorporation of Oregon’s native species back into their dune systems. These are ongoing goals of OPRD and this pilot project will give us the scientific backing to promote ecological diversity in our coastal dunes. We look forward to working with you and believe the proposed study will improve existing knowledge, contribute to our management objectives, and be useful to Oregon’s coastal communities.

Sincerely,

Trevor Taylor  
Stewardship Section Manager



# Oregon

Kate Brown, Governor

Department of Land Conservation and Development

Oregon Coastal Management Program

810 SW Alder Street, Suite B

Newport, OR 97365

[www.oregon.gov/LCD](http://www.oregon.gov/LCD)



August 4, 2020

Dr. Meagan Wengrove  
Assistant Professor  
Civil and Construction Engineering  
Oregon State University  
1491 SW Campus Way  
Corvallis, OR 97331

Dear Dr. Wengrove,

On behalf of Oregon's Coastal Management Program (OCMP), I am writing to support the proposal to the Oregon Wildlife Foundation entitled "Exploring foredune restoration strategies with native vegetation to guide management practices on the Oregon coast." The proposed effort will help fill data gaps in foredune management techniques that affect at least six communities along the Oregon coast.

The state of Oregon requires that communities wishing to manage their foredunes have a dune management plan in place. Coastal City Planners are enlisted to help communities come up with an effective dune management plan. Oregon has a Dune Management Planning document that provides guidance for drafting a county or city specific Dune Management Plan. The planning guide is intended to outline restrictions under Oregon's Statewide Planning Goal 18, but since it was last updated in 1984, it falls short of pointing planners to the best available science. OCMP would like to update its best practices guidance about Oregon dune management to both private and state entities needing to manage foredunes. Having better science about dune systems in Oregon would help inform that guidance. Oregon dunes are much different than those on the east coast, where much of the knowledge exists. The proposed work in this project will increase scientific capacity surrounding dune management practices in Oregon. OCMP will then be able to point coastal communities and homeowners looking to form or update their Dune Management Plans to the proposed Oregon Dune Booklet as an unbiased scientific resource.

In addition, we look forward to inviting you to the Oregon Coastal Planners networking meetings to introduce the idea of the Oregon Dune Booklet and engage with coastal planners to make sure that the format of the results are useful and usable. We look forward to working with you and believe the proposed study will improve existing knowledge and be useful to Oregon coastal communities.

Sincerely,

Meg Reed, Coastal Shores Specialist  
Oregon Coastal Management Program  
Department of Land Conservation and Development