



THE BEACHGRASS PROJECT **FIELD GUIDE**

Using field work to help
student scientists grow



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OUR GOAL

This field guide is meant to be used by students at many different grade levels and scientific abilities.

You will find in these pages helpful photos and notes to help you identify various species you will see on the beach during your work. Once identified, you can make observations, collect data, and become part of the scientific research happening in our state.

The goal of this work is to empower you as a scientist, to realize that you have skills and can do work to improve our understanding of the world.



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INTRODUCTION TO DUNES



Dunes cover nearly a third of the world's ice free coastlines, and provide many ecosystem services, including recreation, protection from storms, carbon storage, and habitat for a wide variety of species.

Left: View from the top of the dunes at Pacific City, Oregon. Photo from Risa Askerooth.

Dunes are built by beachgrasses that trap sand. Eventually, feedback between sand deposition and beachgrass growth forms large, parallel dune ridges.

Structure of a dune

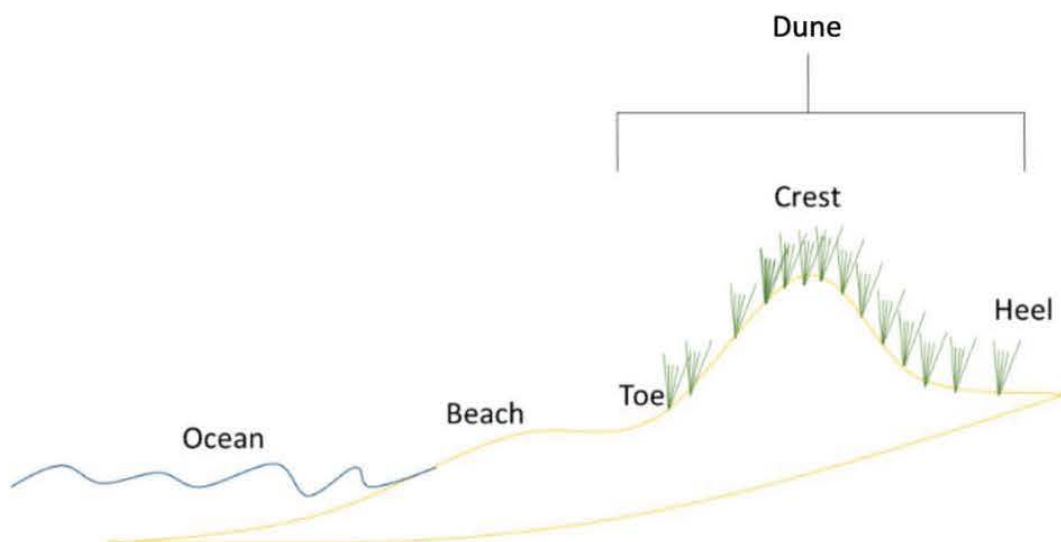


Figure adapted from John Stepanek.

The three major parts of a dune are called the toe (closest to the beach), crest (the highest point on the dune), and the heel (low point behind the crest).

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DUNE GRASS SPECIES



European beachgrass
Ammophila arenaria

- Stems growing in a tight clump, dense
- Leaves rolled
- Ligule long, pointy (~20mm)



American beachgrass
Ammophila breviligulata

- More space between stems, less dense
- Leaves wider
- Ligule very short and flat (~2mm)



Hybrid beachgrass
Ammophila arenaria x *A. breviligulata*

- Intermediate leaf width
- Intermediate ligule length (~7mm)



American dune grass
Leymus mollis

- The only native dune grass here!
- Very wide leaves with waxy coating, often grey-blue
- Prominent midrib
- Very short ligule (<1mm)

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OTHER PLANT SPECIES



"Abronia latifolia habit on a beach in Washington state" by Eric Yarnell is licensed under CC BY-SA 3.0

Yellow sand verbena
Abronia latifolia

- Yellow, trumpet-shaped flowers
- Native to the west coast of the U.S.
- Edible roots, which were traditionally eaten by the Chinookan peoples



"Sea rocket on beach" by John Tamm, 2011 is licensed under CC BY 2.0

Sea rocket
Cakile edentula and *C. maritima*

- Both American and European sea rocket grow on Oregon coastal dunes
- Produce purple or white flowers
- Sprawling stems with thick leaves



"Beach pea" by Anita Gould, 2005 is licensed under Attribution Non-Commercial 2.0 Generic (CC BY-NC 2.0)

Silky beach pea
Lathyrus japonicus

- Opposite leaves with purple flowers and tendrils at the end of stalks
- Peas flower in mid- to late- summer



"Fragaria chiloensis" by Michael J. Piegens, 2008 is licensed under Attribution-ShareAlike 4.0 International (CC BY-SA 4.0)

Beach strawberry
Fragaria chiloensis

- Small, white flowers
- Leaves are dark green, lobed
- Spreads through runners on the sand

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ANIMAL SPECIES



"Double-Crested Cormorant" by Colin Durfee is licensed under CC BY-NC-SA 2.0

Double-crested cormorant
Nannopterum auritum

- Large water bird with long neck
- Orange-yellow skin around chin
- Often seen "wing-spreading" to dry feathers



"La Jolla Sea Lions, California" by reidneuebler is licensed under CC BY-SA 2.0

California sea lion
Zalophus californianus

- Slender, tapering body, brown in color
- External ears
- Rotate rear flippers to move quickly



"California 06424 - Western Sandpiper" by archer10 (Dennis) is licensed under CC BY-NC 2.0

Western sandpiper
Calidris maur

- Often seen landing to feed and taking off
- Quick moving birds along break line on sand



"Western Snowy Plover Adult Feeding" by USFWS Pacific is licensed under CC

Western snowy plover
Charadrius alexandrinus

- Endangered & protected
- Moves along sand on foot
- Back cap behind a white forehead

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ANIMAL SPECIES



"Pacific Mole Crab female" by Ingrid V Taylor is licensed under [CC BY 2.0](#)

Pacific sand crab
Emerita analoga

- Body is the rough shape of an egg, their underside is white and their eggs are orange
- They are motile (capable of motion) filter feeders



"Polyphyla decemlineata" by Junjardapark is licensed under [CC0 1.0](#)

Beetles
Many different species

- There are roughly 107 beetle species found in Oregon
- Beetles have poor vision, and rely on pheromones, sounds or vibrations for communication



"Wildlife at Hyatt Lake" by BLM Oregon and Washington is licensed under [CC BY 2.0](#)

Osprey
Pandion haliaetus

- Ospreys are migratory, coming to Oregon in April and leaving, often for Mexico, around September
- They mate for life, returning to the same nest each year



"American bald eagle" by Howcheng is licensed under [CC BY-SA 2.0](#)

Bald eagle
Haliaeetus leucocephalus

- Opportunistic feeder, preying mainly on fish
- Females are 25% larger than males
- Bald eagles are not actually bald - their name comes from an older meaning of the word "white-headed"

MEASUREMENT RESOURCES

Since vegetation affects the shape of dunes by trapping sand, and also because certain species are threatened or endangered, it is important to understanding the abundance and diversity of dune plant species.

Some of the methods we use to collect measurements are:

- Quadrat surveys
- Transect surveys

Some of the plant characteristics that we measure are:

- Beachgrass stem height
- Beachgrass stem density
- Visual estimates of percent cover

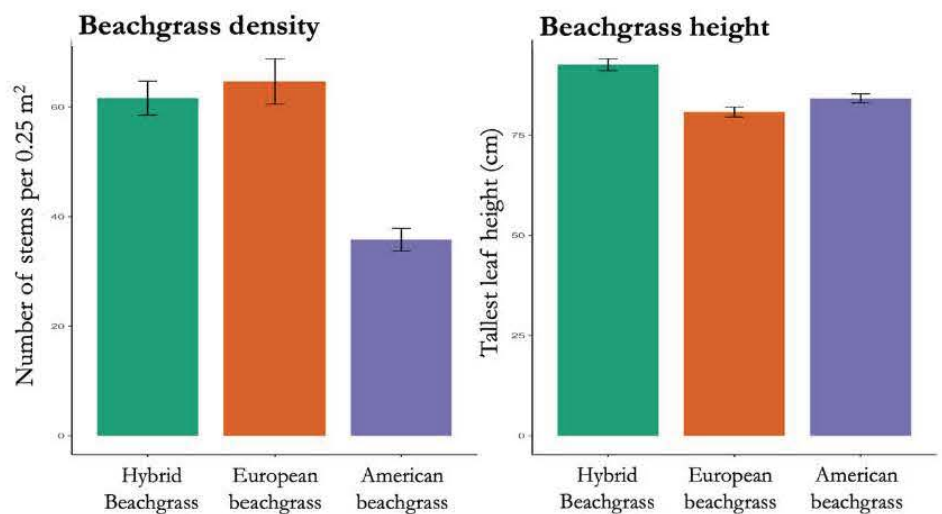
Height measurement example



Taller plants can lead to more sand captures and potentially taller dunes. Therefore, it is important to determine how tall different grass species grow in the field, by measuring the height of a beachgrass stem from the base of the sand to the leaf tip.

Data from the field

The stem density and stem height data on the right was collected by scientists at Oregon and Washington coastal dune sites. From these data, we can see that the hybrid grows denser than one of its parents, and taller than both of them.



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CONTACT US

Oregon Marine Scientist and Educator Alliance
(ORSEA)

<https://oregoncoaststem.oregonstate.edu/orsea>