

Camp Westwinds Field Exercise—Succession Forest Through Time and Space 2004

Objectives

Succession is difficult to observe in a short period of time on one site. Succession is a process which operates through time. Because this is a slow process, change in soil and vegetation at any one location from bare sand to a late stage in the succession such as dune forest will take hundreds of years. However, because the dunes near the coast are young and mostly become progressively older the further one travels from the beach, it is possible to use distance as a surrogate for time.

The goals of this field exercise are to:

- Complete a transect from the beach to the forest
- Identify as many of the beach plants as possible
- Gain familiarity with standard ecological field methods and the difficulties encountered in field work
- Examine the successional patterns and strategies of dune plants

Supplies

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| 1. String, 12 ft | 5. Bags for plant samples | 9. Measuring tape |
| 2. four stakes w/ flagging | 6. Field notebook | 10. Clinometer |
| 3. four nails with flagging | 7. Compass | 11. Pencil and paper for labeling specimens |
| 4. Plant id books | 8. DBH tape | |

Field exercise

You and your field crew (**three students max** per group) will conduct a transect beginning at the sand/vegetation interface. The faculty will assign you and your partners to a specific point to begin your transect. Your first sampling plot (small plots are called quadrats in plant ecology) will be with one edge parallel to the shore at the beginning of your transect.

- 1.) Use your string to mark out your quadrat, 3 feet on a side. Anchor the corners with nails
- 2.) At each sampling site, note the depth of the soil and any legacies that you can observe. In addition, list the environmental factors at each site that could influence the plant community.
- 3.) Record all of the species within the quadrat. Collect a voucher specimen for each species to assist in identification (use “Plant List” for help). Label the plant specimens with your names. If you don’t know what the plant is then write down a distinguishing character that will allow you to recognize the plant again.
- 4.) For each plant, assign it a coverage class (dominant, abundant, common, occasional, rare) and also estimate the percent cover it occupies in the quadrat. You may have percent covers that total more than 100% if you have significant understory vegetation.
- 5.) For each plant, see if you can determine how it is pollinated (wind, self, insect) and how it spreads (seeds, rhizomes, runners etc).
- 6.) Complete the assigned length of your transect with the specified number of quadrats/ plots. This will be specified once we have arrived at the camp. As you walk along your transect, note changes in the plant community even if you aren’t taking a quadrat right where the change occurs. Record the distance from the beach edge where you first encounter a tree.
- 7.) Once you get into trees, switch sampling methods to fixed plot, 1/20 (0.05) acre. Measure all trees and estimate coverage classes using the same methods we have been using in other forests.

Back in the field lab

Identify any unknown plants. Summarize your plant data in neat tables on newsprint. List plant species from dominant to rare. Organize your data from the beach into the forest (left to right). Label with your names.

Questions to consider

- 1.) What patterns do you see in your transect? Look at the plants, the method(s) of reproduction, and legacies. Be ready to communicate these to the rest of the class.
- 2.) At the point where the plant community changes, did it change abruptly or gradually? Can you explain the pattern you observed?
- 3.) An interesting thing to note is the progression of the Shore Pine forest towards the beach, against the prevailing summer and winter (onshore) winds. How does that happen?
- 4.) Imagine that you have to teach a group of junior high school students about succession at the beach. What are you going to tell them?

Dune Plant List

Beach		Swale, Deflation plain	
<i>Ambrosia chamissonis</i>	Silver Bursage	<i>Aster subspicatus</i>	Douglas Aster
<i>Cakile edentula</i>	American Searocket	<i>Carex obnupta</i>	Slough Sedge
<i>Cakile maritima</i>	European Searocket	<i>Juncus falcatus</i>	Sickle-leaved Rush
<i>Honkenya peploides</i>	Seabeach Sandwort	<i>Juncus lesueurii</i>	Salt Rush
Upper Beach, Foredune, Unstable Sand		<i>Potentilla pacifica</i>	Pacific Silverweed
<i>Abronia latifolia</i>	Yellow Sand Verbena	<i>Trifolium wormskjoldii</i>	Springback Clover
<i>Ammophila arenaria</i>	European Beachgrass	Dry Shrub, Forest	
<i>Ammophila breviligulata</i>	American Beachgrass	<i>Arctostaphylos uva-ursi</i>	Kinnikinnik
<i>Calystegia soldanella</i>	Beach Morning Glory	<i>Gaultheria shallon</i>	Salal
<i>Carex macrocephala</i>	Big-headed Sedge	<i>Pinus contorta</i>	Lodgepole Pine
<i>Elymus mollis</i>	American dunegrass	<i>Rhododendron macrophyllum</i>	Western Rhododendron
<i>Glehnia leiocarpa</i>	American Glehnia	<i>Vaccinium ovatum</i>	Evergreen Huckleberry
<i>Lathyrus japonicus</i>	Japanese Beachpea	Wet Shrub, Forest	
Meadow		<i>Alnus rubra</i>	Red Alder
<i>Cardionema ramosissima</i>	Sandmat	<i>Lonicera involucrata</i>	Black Twinberry
<i>Festuca rubra</i>	Red Fescue	<i>Myrica californica</i>	Pacific Wax-myrtle
<i>Fragaria chiloensis</i>	Coast Strawberry	<i>Picea sitchensis</i>	Sitka Spruce
<i>Hypochaeris radicata</i>	Hairy Cat's-ear	<i>Salix hookeriana</i>	Hooker's Willow
<i>Lupinus littoralis</i>	Seashore lupine	Mature Dune Forest	
<i>Polygonum paronychia</i>	Black Knotweed	<i>Arbutus menziesii</i>	Pacific Madrone
<i>Solidago spathulata</i>	Dune Goldenrod	<i>Arctostaphylos columbiana</i>	Hairy Manzanita
		<i>Pseudotsuga menziesii</i>	Douglas Fir
		<i>Tsuga heterophylla</i>	Western Hemlock