

Forest Fast Facts

Low light, low winds, cool temps, high water, rich soil, rare catastrophic events



Coastal Forest

Coastal temperate rain forests have:

- A complex structure including many different canopy layers and different age trees in a single stand - lots of habitats in this habitat!
- An abundance of epiphytes (plants living on the surface of other plants, such as lichens, mosses and ferns).
- Are unique in their abundance of coniferous trees which can grow year round. Have cool temperatures, short growing seasons and a short drought period in summer
- Few deciduous tree species and these are found primarily in disturbed areas (riverbanks, blow-down sites, clear-cuts, etc.) - deciduous tree need more light
- Half of their biomass made of dead trees, including snags and nurse logs (the making of organic soils!)



Sitka Spruce

Sitka Spruce

- Grows well in foggy, cool air and moist soils
- Needles grow from the branch in stiff, sharp bottlebrushes- “shake hands with the spikey Sitka spruce”.
- Scaly cones and bark.
- Typically grow to be 70m tall, 2m in diameter and several hundred years old.
- Good habitat for other organisms
- Was believed by several aboriginal groups from Vancouver Island to have special powers for protection from evil thoughts due to its spikey needles.



Salal

Salal

- Is an evergreen shrub with thick, leathery and shiny leaves
- Has white to pinkish, bell-shaped flowers
- Has reddish-blue to dark-purple, hairy berries that are an important food source for wildlife and aboriginal people (who eat them fresh and dried into cakes).
- Is harvested commercially on the Olympic Peninsula for floral arrangements by “bushwackers”



Moss

Mosses and lichens like the high acids of rich forest soils and high water (they need moisture to reproduce, also lack the more defined water transport structures that other plants have)



Lichens



Sword Fern



Western Hemlock



Redwood Sorrel



Red Huckleberry



Evergreen Huckleberry



False Lilly-of-the-Valley

Sword Fern

- One of the most common ferns in our forests
- Leaves are called fronds and roots are called rhizomes
- Reproduce using spores, which are gathered in groups called sori located on the undersides of the fronds covered by a membrane called an indusium. Spores are spring-loaded to scatter spores away from parent plant.
- Has leaflets that look like tiny swords
- Were used as a protective layer when cooking or storing foods
- Were used as floor and bed coverings
- Rhizomes were baked, peeled and eaten like a potato

Western Hemlock

- Has lacey, short and irregular needles and small cones
- Has a droopy top
- Grows well in shade
- Has bark with a high tannin content and makes an excellent dye

Redwood sorrel

- Often holds its leaflets horizontally to collect light in its shady forest home
- Sometimes folds its leaves vertically if growing in bright sun, at night or if raining - this process takes about 6 minutes to fold and about 30 minutes to unfold
- Contains oxalic acid, which gives them a sour, tangy taste - although edible can be harmful if too much is eaten

Red Huckleberry

- A deciduous huckleberry with edible fruit
- The first huckleberry to be ripe
- Needs high acid/organic soil and good light – often grows on nurse logs or stumps
- Likes light – so grows in openings (often made by falling trees)
- Red berries used as fish bait in streams (look like salmon eggs)

Evergreen Huckleberry

- Sharply toothed shiny evergreen leaves
- Grows in areas near coast, often with salt spray or tidewaters
- Grows near edges or openings (needs light)
- Berries are good to eat and ripe in mid-fall, but last through early winter (making them a good winter food source)

False Lilly-of-the-valley

- Low growing with broadly heart-shaped leaves
- Prefers moist to wet, acid soils, and shady habitats
- Can be the dominate ground cover in coastal Sitka spruce forests
- Small white flowers turn into light green berries mottled with brown

Freshwater Wetlands, Streams and Ponds Fast Facts

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Stream



Pond & Wetland

Wetlands are

- Any area periodically inundated or saturated by water (slow or stagnant water)
- Generally found near permanent water bodies (lakes, rivers, oceans, bays)
- Soak up 'excess' waters from rains or floods quickly like a sponge and release slowly
- Serve as filters and buffers (slow currents, sediment falls from water)
- Plants often have less structure because they will be supported by water at least part of the time

Streams have

- Moving water
- Have large woody debris, pool & riffles, canopy shade, cool temps, high dissolved oxygen
- Experience frequent disturbance from high-flow events (e.g. flooding)

Skunk Cabbage

- Flowers release different odors at different temperature to attract pollinators: Sweet for bees, rotten for beetles
- Has leaves that can grow 3 feet long and 1 foot wide in the shade
- Blooms early in spring



Skunk Cabbage



Licorice Fern

Licorice Fern

- Rhizome tastes of licorice
- Most often found growing in mats of moss on rock, dead logs or live trees

Red Alder

- Thrives in disturbed areas – high sun, poor nutrient soils
- Has a bacteria that grows on its roots that transfers nitrogen from the air into the soil, supporting grasses, sedges and ferns
- Lichens grow on their bark and create an acidic environment for moss to grow.
- Has prominent male and female cones, even in winter



Red Alder

Western Red Cedar

- Has scaly, overlapping needles and stringy bark.
- Grows in damp soils
- Considered the "tree of life" by indigenous cultures on the NW Pacific Coast
- Was rarely cut down before European contact - Planks and bark were taken from the standing tree to be used in a myriad of ways
- Very aromatic – used as pest repellent (lice, ticks, fleas, bed bugs)



Western Red Cedar



Salmonberry



Willow



Water Starwort



Slough Sedge



Mosses & Lichens



Douglas' Aster

Salmonberry

- Shrub can grow up to 4 feet tall
- Dark green leaves – usually in clusters of three
- Prickly stems, bright magenta flowers
- Create thick stands – clones from one plant
- Berries can taste different from one clone to another
- Soft berries are ripe early (May and June)
- Twigs with berries were attached to fishing line and used as bait

Willows (Hooker's, Scouler's, and Sitka)

- Shrubs that grow between 6 and 35 feet tall
- Oval leaves, sometimes grayish green
- Grows along wetland or stream edges, sometimes in dunes
- The soft "pussywillows" or catkins emerge in spring before the leaves do
- Catkins are like flowers and there are both male and females on one tree

Different-leaved Water Starwort

- Roots in mud and can live floating within water or prostrate on mud
- Has minimal structure because water supports stem and leaves
- Creates large mats in slow moving water, ponds and sloughs
- Pollination can occur via air, floating on surface or in water

Slough Sedge

- Has edges (triangular and solid stalks), leaves and stalks roughly hairy
- Is slightly salt tolerant and can be found in upper tidal marshes, but generally prefers freshwater wetlands

Lichens and mosses colonize recently disturbed areas and help to create soil.

Douglas' Aster

- Primarily coastal
- Prefers moist soils in meadows, stream banks and wetlands

Estuary Fast Facts

Tides, high sun/temperature, high amount of daily change, muddy or sandy soil



Estuary



Salt Marsh



Tidal Mudflats



Deep Channels



Eelgrass



Diatoms

Estuaries are characterized by the mixing of freshwater streams with ocean tides.

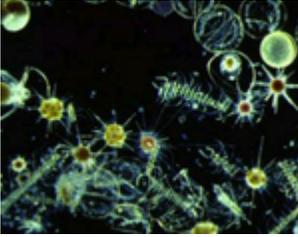
- Include open water and deeper channels, mud flats and salt marshes.
- Salinity can change drastically – being more fresh when tide is out allowing river water to influence, higher when tidal waters from ocean inundate
- Occur worldwide, including every coast of the U.S. Are essential food, refuge and nursery habitat for more than 75% of all fisheries species.
- Shallow, with only a few deep channels at low tide – “Fish Highways”
- Willapa Bay is dominated by eelgrass meadows (few bays exist like this on the Pacific Coast)
- Smell like rotten eggs due to bacteria that grow in areas of extreme low oxygen. This is created by the high amount of decomposing organic material.
- Have salt-loving plants (halophytes) that grow in different elevational zones. These zones may differ in as little as a few centimeters but has great effect on the amount of salinity the plant may be faced with (high in elevation more salty due to less water to flush the dried salts away).
- Can have sandy (near streams) or muddy soils (more influenced by ocean).
- Plants are often succulent or waxy to maintain water.
- Currents make it hard for annual plants to establish from seed. Most plants are perennial, growing each year from established roots or clone by breaking off from parent plant to root.

Eelgrass

- Is a flowering plant that grows under water, pollen is stringy and waterborne
- Grows in large colonies on muddy “soils”; submerged or partially floating
- Rhizomes keep it anchored and create habitat in the open waters of the bay
- Leaves, called blades, slow currents and trap sediments
- Needs light to grow and will not grow more than 22 feet below water surface. Average is 9-10 feet below
- Support a variety of microscopic diatoms, bacteria, algae and detritus on their leaves. Animals, too!
- Grow in spring and summer, dies back during winter

Diatoms

- One-celled organisms that use photosynthesis (part of phytoplankton)
- Can sometimes live in filamentous colonies - can be confused with brown algae
- Make a thin, scummy brown growth on rocks, shells, wood, mud, plants, or can be free-floating
- Cell wall composed of silica – makes them slippery on your fingers



Phytoplankton

Phytoplankton

- Microscopic, often one-celled plants, very diverse
- Live in water column
- Food for many
- Diatoms are plankton
- Hundreds of thousands of plankton can fit in a 1 centimeter cube



Pickleweed

Pickleweed, Glasswort or Saltwort

- Has fleshy stems that can be eaten raw or preserved as 'sea asparagus'
- Has tiny leaves
- Is deciduous and dies back in winter
- Doesn't grow in places with high wave action
- Highly salt tolerant. Lives in the lower to middle salt marsh



Salt Grass

Salt Grass

- Grows from long rhizome/roots in tight mats (like sod/lawn grass)
- Highly tolerant of salt. Lives in the lower to upper salt marsh



Lyngby's Sedge

Lyngby's Sedge

- Lyngby's Sedge is the most common along estuary shorelines
- Pioneer colonizer of mud flats
- Forms large meadows along salty and brackish shorelines
- Sedges have edges
- Create habitat (shelter and food) for other species



Dock

Western Dock

- Grows in wet to moist areas such as the upper salt marsh
- Can be up to 6 feet tall from large tap root
- Tiny flowers turn into lots of papery seeds



Cow Parsnip

Cow Parsnip

- Very large (up to 9 feet tall) and hairy plant
- Strong pungent odor
- Common in wet, sunny, disturbed areas such as the upper salt marsh
- Contains a toxin that can cause skin irritation



Seashore Plantain

Seaside Plantain or Goose-tongue

- Grows from taproot in saltmarsh, and sandy or gravelly beaches
- Slender, fleshy leaves grow from base
- Leaves are succulent and can be eaten

Dunes and Grasslands Fast Facts

High wind, high sun/temperature, high disturbance from wind, sandy soil/low organics



Historic Leadbetter Dunes



Grassland

Dunes and grasslands are...

- Historically open areas with native prairie vegetation. Large areas of open sand are sparsely vegetated with native dune plants, few trees and shrubs (high sun due to lack of shade).
- Native plants have been out-competed by non-native grasses and sand stabilization
- These openings were maintained by high disturbance - wind transported sand, small mammal activity, herbivory (animals eating plants) and fire.
- Characterized by low relief, mild temperature, high rainfall and fog, high water table, and wind.
- Most plants have thick, leathery or waxy leaves to maintain moisture from wind & sun.

Beach Grass

- Most is not native – brought in to stabilize sand and it has, which has altered the dunes and grasslands dramatically. Non-natives grasses grow more aggressively and tight together trapping sand and making it difficult for wildlife to move through. It outcompetes other plants leaving little to no space for other species
- Spreads by rhizomes/roots underground (stabilizes sand with roots and collects more sand by capturing wind-blown particles in leaf bases)
- Can be more than 3 feet tall, with roots 3-4 feet deep
- Sand stimulates root growth
- Uses long and prolific root structure to find and acquire water in sand



Beach Grass



Kinnikinnick

Kinnikinnick

- Grows low along the ground in dry soils, has leathery leaves
- Latin name is *Arctostaphylos uva-ursi* which translates as common bearberry
- Has berries – but they are dry, pulpy and tasteless.



Coastal Strawberry

Coastal Strawberry

- Always grow close to the sea
- Has long rhizomes from which new plantlets grow; helps to stabilize sand
- Have small, tasty fruits, and tea can be made from the leaves



Large-headed Sedge

Large-headed Sedge

- Lives along seashores and in coastal dunes
- Single or small groups of stems grow from a long, horizontal rhizome buried in the sand creating nearly straight lines of plants.
- 10 – 40 cm tall and stout with a large egg-shaped inflorescence (that looks shreddy and spikey)
- Leaves are clustered near base



Red Elderberry

Red Elderberry

- Shrub or small and tree-like
- Bark is dark and warty, twigs are soft and pithy (toxic)
- Leaves are lance-shaped, toothed and grow in 5-7 leaflets
- Grows along stream banks, moist clearings and open forests
- Small white flowers turn to bright red berries



Lichens and Mosses

Lichens and mosses colonize sand in less windy areas and start to form soil

Early Blue Violet

- Dainty and low growing
- Small heart-shaped leaves
- Blooms in early spring and may still have flowers into mid-summer
- Only host plant for the threatened Oregon silverspot butterfly larvae



Early Blue Violet

Wax Myrtle

- Has waxy, evergreen leaves
- Has wax covered cones/fruits – great winter food for many types of birds
- Grow as large shrubs/small trees
- We are near the northern end of their range – habitat is generally unsuitable north of Grays Harbor area



Wax Myrtle

Shore (Lodgepole) pine

- Can tolerate salt spray and low-nutrient conditions such as sand and bogs
- Generally only grows to be 20m tall, and can sometime have a bonsai form that is only a few feet tall and twisted
- Has needles in bunches of two and cones with a sharp tip
- Has pitch that was used to waterproof canoes and baskets, as glue, and to protect fishing nets



Shore pine

Common Yarrow

- Grows well in disturbed sites, with high sun (i.e. upper salt marsh, grasslands)
- Very aromatic – crush leaves and smell
- Flowers white to pinkish, and leaves are soft and feathery
- Nectar plant for the for the threatened Oregon silverspot butterfly



Yarrow

Pearly Everlasting

- Narrow lance-shaped leaves, often woolly below
- Flowers are a cluster of “pearls” that last well into winter
- Grows nearly anywhere open and sunny (i.e. grasslands, dunes, upper salt marsh)
- Nectar plant for the for the threatened Oregon silverspot butterfly



Pearly Everlasting