Forest Fast Facts


Sitka Spruce


Salal


Moss


Mosses & Lichens

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

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

- 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

- 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"

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)

Sword Fern

Western Hemlock

Redwood Sorrel

Red Huckleberry - winter

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)

Dunes/Grasslands Fast Facts


Beach Grass


Shore Pine


Kinnickinnick


Coastal Strawberry

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

Dunes/grasslands are…

- Historically open areas with native prairie vegetation - Large areas of open sand and sparsely vegetated with native dune plants, few trees and shrubs (high sun – 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 (wind & sun)

Beach Grass

- Most is not native – brought in to stabilize sand and it has done too good a job which has altered the dunes and grasslands dramatically. Non-native grows more aggressively and tight together – traps sand and makes it difficult for wildlife to move through, outcompetes other plants (no space)
- 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 roots structure to find and acquire water in sand

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

Kinnikinnick

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

Coastal Strawberry

- Always grow close to the sea
- Long rhizomes to create new plantlets, helps stabilize sand
- Have small, tasty fruits, tea can be made from the leaves

Pink Sandverbena

Searocket

Wax Myrtle

Evergreen Huckleberry

Mosses & Lichens

Pink Sandverbena

- Low growing on sand
- Has sticky hairs (glandular) on stems and leaves
- Was thought to no longer live in Washington State - was re-discovered in the early 2000s by refuge staff
- Related to a more common species, yellow sand verbena

Searocket

- Has fleshy stems and leaves
- Grows along outer dunes and upper sandy beach
- If buried by sand, it responds by increasing rate of growth

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

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)

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

Mudflats and Saltmarsh Fast Facts


Pickleweed


Salt Grass


Sedges


Green Algae

Tides, high sun/temperature, high disturbance, muddy or sandy soil

Salt marshes and mudflats:

- Are coastal wetlands that are flooded by tides (submersion, salinity, and temperature changes)
- Smell like rotten eggs due to bacteria that grow in areas of extreme low oxygen (high amount of organic material – decomposing)
- Occur worldwide, including every coast of the U.S. Are essential food, refuge and nursery habitat for more than 75% of all fisheries species
- Protect shorelines from erosion by buffering wave action and trapping sediments
- 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 (so most are perennial growing each year from established roots or clone by breaking off from parent plant to root)

Pickleweed, Glasswort or Saltwort

- Has fleshy stems eaten raw or preserved as 'sea asparagus'
- Has tiny leaves, deciduous/dies back in winter
- Doesn't grow in places with high wave action
- Highly salt tolerant – low to middle salt marsh

Salt Grass

- Grows from long rhizome/roots in tight mats (like sod/lawn grass)
- Highly tolerant of salt – low to upper salt marsh

Lingby's Sedges

- Lingby'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

Green Algae – Sea Lettuce

- Marine algae that need high light (green chlorophylls)
- Generally thin, bleaching to tissue-paper likeness when dead
- Lower salt marsh and upper mud flats

Western Dock

Western Dock

- Grows in wet to moist areas – upper salt marsh
- Can be up to 2 m tall from large tap root
- Tiny flowers turn into lots of papery seeds

Cow Parsnip

Cow Parsnip

- Very large (up to 3 m tall) and hairy plant
- Strong pungent odor
- Common in wet, sunny, disturbed areas – upper salt marsh
- Contains a toxin that can cause skin irritation

Yarrow

Common Yarrow

- Grows well in disturbed sites, high sun – upper salt marsh
- Very aromatic – crush leaves and smell
- Flowers white to pinkish
- Leave are soft and feathery

Gumweed

Entire-leaved Gumweed or Resinweed

- Grows from taproot
- Uppermost leaves and flower bases covered in sticky latex or gum
- Mostly lives in marine habitats – upper salt marsh

Freshwater Streams, Wetlands and Ponds Fast Facts


Skunk Cabbage


Licorice Fern


Red Alder


Western Red Cedar

High disturbance due to water - can have muddy, sandy or gravelly soils

Wetlands are

- Any area periodically inundated or saturated by water (slow or stagnant water)
- Are generally found near permanent water bodies (lakes, rivers, oceans, bays)
- Soak up 'excess' waters from rains or floods like a sponge quickly – 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 are

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

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
- Often have lichens growing on their bark, lichens create an acidic environment for moss to grow, mosses and lichens can create simple soils for other plants to grow
- Has prominent male and female cones, even in winter

Western Red Cedar

- Has scaly, overlapping needles and stringy bark.
- Grows in damp soils
- Is considered the "tree of life' by most 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)

Aquatic plants live in or on water and often lack structure to stems and leaves

Salmonberry

Sedge

Mosses & Lichens

Rush, Cattail

Douglas Spirea, Hardhack

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

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.

Willows

- Shrubs that grow between 6 and 35 feet tall
- 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

Rushes

- Are round, less tolerant of salty soils

Cattails

- Tall – up to 3 meters with stiff upright stalks and long narrow leaves
- Make great habitat for many animals (shelter, food)

Douglas Spirea, Hardhack

- Dark green leaves that are often grey and woolly on undersides
- Like stream banks, wet meadows, ditches
- Up to 2 meters tall and grow in thickets

Bay Fast Facts


Eelgrass


Diatoms


Rockweed

Open water and tidal cycles - Tides change salinity, temperature, and water levels

Willapa Bay:

- Salinity can change drastically – being more fresh when tide is out allowing river water to influence, higher when tidal waters from ocean inundate
- Sand and mud bottom, with patches of vegetation
- Shallow**, with only a few deep channels at low tide – "Fish Highways"**
- Rich organic content in mud, sand and water – lots of dead materials (plant, animal, waste/poop)
- Dominated by eelgrass meadows (few bays exist like this on the Pacific Coast)

Eelgrass

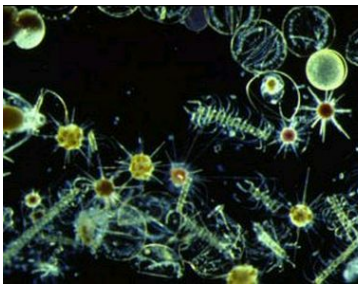
- Grows submerged or partially floating
- Grows in large colonies on muddy 'soils'
- Rhizomes keep it anchored and create habitat in the open waters of the bay (compare to beach grass, then trees)
- Grow in spring and summer, die back some during winter
- Support a variety of microscopic diatoms, bacteria, algae and detritus on their leaves. Animals, too!
- Is a flowering plant that grows under water, pollen is stringy and waterborne
- Slows currents and traps sediments
- Needs light to grow
- Doesn't grow beneath 22 ft below water surface – average 9-10 ft below

Diatoms

- One-celled organisms that use photosynthesis
- 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

Brown Algae, like Rockweed

- Grow at deeper water levels than green algae, because it has additional pigments similar to chlorophyll that can process more of the light spectrum (reds even deeper)
- Often have a holdfast (like a tiny fingered hand) to hold on to rocks. Few rocks exist in the bay, so algae hold onto eelgrass, other plants or pilings
- The stiffening agents for ice cream come from brown and red algae (carrageenan)
- Often found washed onto shore



Phytoplankton

Docks and Pilings

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

Sponges

- An animal, not a plant
- Filter feeder – pumps water through it and gathers food particles
- Often found washed up on the beach
- Invasive species from east coast
- Turns brown as it dries (its red when alive)

Docks & Pilings take the place of rocks in open water and create habitat