

# Forest Fast Facts

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- LIGHT:** Dominated by tall trees, layered canopy = very shady, openings made from a fallen trees provide sunny areas
- AIR:** Trees slow wind, except along forest edges and openings. Shade = cool temps
- WATER:** Fog and rain collect in tree branches and drip to ground.
- SOIL:** Lots of organics (needles, decaying leaves, tree trunks) makes lots of space for air and water in soil. Soil absorbs and holds water like a sponge.



Coastal Forest

## **Trees - Snags & Logs (producer in life, habitat in death) *photo, specimens***

- Trees are habitat to many plants and animals in life and death. Stumps, logs and standing dead trees provide important nutrients and access to L.A.W.S.

## **Fungus (decomposer) *specimen***

- Mycelia (nutrient absorbing filaments) help to break down scat, and dead plant and animal material into soil
- Mushrooms & conks are reproductive structures. The fungus is usually many times larger than what you can see.



Fungus

## **Varied Thrush (predator, omnivore, generalist) *study skin***

- Slender bill good at gleaning soft foods like insects, pill bugs, snails, worms, fruits and some seeds from ground.
- Hops and pauses to look for food. Flips leaves and debris with bill.
- Perching feet, with three toes forward and one back, are good for perching in trees and hopping on ground.



Varied Thrush

## **Ground Beetles (predator, carnivore/generalist) *live animal***

- Ground beetles have walking legs and sharp, biting jaws.
- Eats snails, slugs, maggots and worms.
- Generally nocturnal - large eyes and antennae. Hides under bark and in logs during day.



Ground Beetle

## **Northwestern Salamander (predator, omnivore/generalist) *live animal***

- Big eyes – sees well in dark places.
- Lives mostly underground in forests, also in soft/decaying logs, in bark or wood mounds around the bases of snags
- No teeth or claws
- Eats worms, beetles, slugs – anything it can catch and swallow
- One of the largest northwest salamanders
- Excretes large amounts of white poison when threatened, although it is not very toxic to humans



Northwest Salamander



Marbled Murrelet



Banana Slug



Northwestern Deer Mouse



Red Huckleberry



Townsend's Chipmunk



Big Brown Bat

**Marbled Murrelet (Predator, carnivore/specialist) specimen, photo**

- Diving seabird that nests in old-growth coastal conifers
- Webbed feet placed far back on body combined with slender pointed wings help birds 'fly' underwater to catch fish and crustaceans.
- No hind toe
- Can't soar – wings modified for swimming
- Needs tree branches that are at least 6" diameter on which to nest
- Because it is a rapid, but not precise flyer – there must be large spaces between branches so it can land. This bird drops straight off branch to gain speed for take-off.

**Banana Slug (prey, herbivore/decomposer) live animal**

- Secretes slime to help it move along
- Must have moist environment – active on humid days or at night
- Eats a variety of fungi and plants with a toothed tongue

**Northwestern Deer Mouse (prey, omnivore/specialist) skull, photo**

- Mostly arboreal (tree dwelling) – has long tail to help balance it while climbing
- Sharp front teeth for clipping and grinding teeth in back for chewing
- Eats berries, shrubs, seeds (especially spruce and hemlock seeds) and some invertebrates.

**Red Huckleberry (producer, specialist) specimen, photo**

- A deciduous huckleberry with edible fruit
- The first huckleberry to be ripe in early summer
- 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)

**Townsend's Chipmunk (Prey, omnivore/generalist) study skin, skull**

- Eats roots, bulbs, grasses, seeds, berries, fungi, large insects, eggs, baby birds and carrion.
- Runs fast, excellent climber
- May travel more than ½ mile in search of food.
- Can hold and transport more than 100 oats at one time in its cheek pouches.

**Big Brown Bat (Predator, carnivore/specialist) specimen, photo**

- Nocturnal – uses echolocation to locate night-flying insects
- Roosts by feet in tree cavities, in deep bark crevices, logs or under bark (and buildings)
- Eight species use the refuge – little brown myotis, big brown bat, Yuma myotis, long-eared myotis, long-legged myotis, California myotis, silver-haired bat, and hoary bat.

# Freshwater Wetlands, Streams and Ponds Fast Facts

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**LIGHT:** Streams often shaded by trees. Wetlands can be open and sunny

**AIR:** Moving water with riffles increases dissolved oxygen in water

**WATER:** Fresh water. Streams are generally clear. Wetlands can be murky with tannins

**SOIL:** Wet soils. Can be gravelly in streams and rich in organics with finer particles in wetlands and ponds



Stream



Pond & Wetland



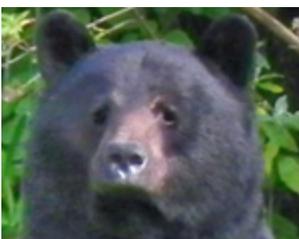
Skunk Cabbage



Salmonberry



Bees and Flies



Black Bear

## **Skunk Cabbage (producer, specialist) specimen, photo**

- Flowers release different odors at different temperature to attract pollinators. Sweet for bees, rotten for beetles.
- Grows in wet soils.
- Eaten by elk and bears.

## **Salmonberry (producer) specimen, photo**

- Dark green leaves – usually in clusters of three
- Prickly stems, bright magenta flowers
- Create thick stands along stream bank and wet areas – clones from one plant
- Soft berries are ripe early (May and June)

## **Pollinators – Bees & flies (prey, herbivore/detritivore/some specialists) specimens**

- Pollinators – 75% of all flowering plant species need the help of animals to move their heavy pollen grains from plant to plant for fertilization. Most of the pollinators are insects, such as bees, wasps, beetles, ants, butterflies, moths and flies. Some are specific to certain plant species.
- The larvae of some species of flies and beetles live and feed on carrion and scat. Some wasps lay eggs in a paralyzed host.

## **Black Bear (predator, omnivore/scavenger, generalist) skull, figurine**

- Eats almost anything – 95% of diet is plant material, including leaves, buds, flowers, berries, fruits and roots. Will also eat fish, insects (including bees), mammals and carrion.
- Great sense of smell.
- Teeth like ours – flat front for clipping, pointing canines for holding, flat molars for grinding.
- Claws for climbing and some digging.
- Eyes in the front – bears have vision as good as humans.
- Will forage in nearly all habitats, but tend to den in forested areas.
- Wetlands are a great place to look for bear tracks and scat.



Tree Swallow

**Tree Swallow (predator, carnivore/specialist) photo**

- Short, wide mouth and long pointed wings helps catch insects while flying at high speeds (needs open areas).
- Will eat berries and seeds, if insects are unavailable.
- Drink from water surface while flying.
- Nests in dead trees near wetlands



Red-legged Frog

**Red-legged Frog (predator, omnivore/generalist) live animal**

- Lives in wet forests, ponds or wetlands.
- Eats worms, beetles (invertebrates) – anything it can see then catch and swallow
- Tadpoles are herbivores and eat algae
- Attaches egg masses to submerged vegetation
- Eaten by herons, garter snakes, fish, racoons and bullfrogs



Raccoon

**Raccoon (predator, omnivore/generalist) skull, figurine**

- Highly sensitive paws allow it to probe and feel for food.
- Sharp teeth and jaws for slicing and chomping.
- Eats fruits, nuts, berries and insects, clams, frogs, fish, eggs, young birds and rodents. Will build large fat reserves for winter.
- Uses salt marsh and mud flat habitats, too!



Copepods

**Copepods (prey, herbivore/scavenger/generalist) photo, specimen**

- Microscopic crustacean (considered zooplankton) that is ~1-2 mm long
- Eats phytoplankton, detritus and bacteria



Western Pearlshell Mussel

**Western Pearlshell Mussel (predator/prey, omnivore/specialist) shell**

- Live only in cold, clear streams with gravelly bottoms
- Use gills to filter algae, zooplankton and bacteria out of water
- Needs salmon and trout for reproduction – larvae attach to fish gills and are transported in stream
- Eaten by raccoon and river otters.



Waterstriders

**Waterstriders (predator/prey, carnivore/generalist) photo, specimen**

- Skates on the water's surface, and uses highly-adapted foot hairs to sense prey.
- Pounce, catch, pierce and suck from insects, crustaceans that fall into the water or float to surface.



Coho Salmon

**Spawning Coho Salmon (prey) photo**

- In death, they provide important nutrients from the ocean to forest and stream soils (nitrogen and phosphorus).
- Doesn't eat once it returns to fresh water. Although some young males (called Jacks) will spawn and return to the ocean to become predators again.
- Eaten by many animals from invertebrates to otters, raccoons, bears and more.

# Estuary Fast Facts

**LIGHT:** No trees or shrubs = very sunny. Shallow water means that light reaches to the bottom in most places

**AIR:** Open = very windy. Lack of shade = warm temps

**WATER:** Brackish water, tidal influence (changing water and salinity levels)

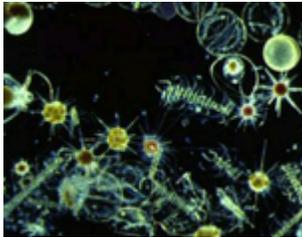
**SOIL:** Sandy, muddy or gravelly. Lots of dead and decomposing material.



Estuary



Eelgrass



Plankton



Lyngby's Sedge



Brant



Littleneck Clam

## **Plankton & Diatoms (producer, generalist) *photo***

- Microscopic, often one-celled plants, very diverse
- Hundreds of thousands of plankton can fit in a 1 centimeter cube

## **Eelgrass (producer, specialist) *specimen, photo***

- Create habitat by slowing current and collecting soil
- Leaves support a variety of microscopic diatoms, bacteria, algae and detritus. Invertebrates live on and eat them, too!
- Can't grow below 22 feet deep in water – needs shallow estuaries to grow

## **Lyngby's Sedge (producer, generalist) *specimen, photo***

- Lyngby's Sedge is the most common along estuary shorelines
- Prime forage for geese, swans and bears – high protein when young (25% crude)
- Create habitat (shelter) for other species

## **Brant (prey, herbivore/specialist) *specimen***

- Dabbler or grazer – long legs and webbed feet placed mid-body for ease of walking and swimming.
- Flattish bill to eat vegetation – primarily eats eelgrass in winter. Will eat some aquatic invertebrates, like isopods.

## **Littleneck Clam (prey, omnivore/detritivore/specialist) *shell, photo***

- Filter feeder – draws water through siphon and gills to filter out phytoplankton, zooplankton and detritus from water.
- Uses foot to dig into sand or gravelly substrate.
- As larvae they swim and are considered zooplankton
- Eaten by crabs, seals, raccoons, river otters and humans



Dungeness Crab



Chum Salmon Fry



Garter Snake



Townsend's Vole



Great Blue Heron



Amphipod



Eelgrass Isopod

**Dungeness Crab (predator/prey, carnivore/detritivore/generalist) shell, photo**

- Uses pincers to open and eat clams, small fish and marine worms. Will scavenge dead animals.
- Uses eelgrass beds as nurseries and hunting grounds.

**Chum Salmon Fry (predator/prey, omnivore/detritivore/generalist) photo**

- Feeds in shallow estuaries until large enough to escape predators – stripes and spots help it blend in with underwater vegetation, like eelgrass.
- Eats nearly anything it can fit into mouth, including: detritus, copepods, amphipods, larval fish, shrimp and crabs.

**Garter Snake (predator/prey, omnivore/generalist) shed skin, photo**

- Eats slugs and earthworms, will also eat snails, frogs, fish, salamanders, frogs and small birds and mammals.
- Often hunt near freshwater and shorelines.
- Seek out open spaces and rocks to sunbathe
- Can eat rough-skinned newts (tolerant of toxins)

**Townsend's vole (prey, herbivore/generalist) skull, photo**

- Digging claws
- Eats tender marsh and grassland vegetation, bark of shrubs, stems and root of conifers with slipping front teeth and flatten grinding teeth in back.
- Eaten by snakes, herons, raptors, weasels

**Great Blue Heron (predator/prey, carnivore/generalist) skull, photo**

- Long neck and bill help it catch and eat fish, amphibians, small mammals and nestlings. "S" curve of neck and other designs allow for lightning quick speed. Stalk and spear.
- Nests high in trees with other herons (colony nester) to protect from predators like raccoons. Makes a nest out of woven sticks.

**Amphipods (predators/prey, omnivore/scavenger/generalist) specimen, photo**

- Come in a variety of sizes, mostly smaller than a few centimeters in length.
- Flattened side-to-side, these crustaceans are free-swimmers, bottom dwellers, and are found under debris in tidal areas and salt marshes
- Eat plankton and detritus
- Eaten by shorebirds, crabs, fish, marine worms

**Eelgrass Isopod (prey, herbivore/specialist) specimen, photo**

- Crustaceans that are flattened-like a pancake (pillbugs are isopods)
- Eat plants, algae, eelgrass (some isopods are parasitic on animals)
- Often match the color of the plant they live on
- Use claws to hold onto plant.
- Major food source of fish

# Dunes and Grasslands Fast Facts

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**LIGHT:** Few trees and shrubs = very sunny

**AIR:** Open = very windy. Lack of shade = warm temps

**WATER:** High water table = seasonal wetlands. Sand drains quickly = dry

**SOIL:** Sandy with lots of space for air. Soil historically unstable and moved with wind.



Historic Leadbetter Dunes



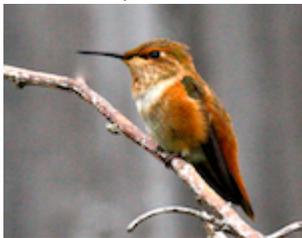
Grassland



Early Blue Violet



Spiders



Rufous Hummingbird



Porcupine

## **Grasses & Forbs (producers, generalists) specimen, photo**

- Often first plants to colonize, especially those with rhizomes that can search for water/nutrients and stabilize soils.
- Creates food and shelter for invertebrates, small mammals, snakes

## **Shore Pine (producer, specialist) specimen**

- Can tolerate salt spray and low-nutrient conditions such as sand
- Provides food, perches and shelter for birds, mammals, spiders and insects

## **Early Blue Violet**

- Dainty and low growing with small heart-shaped leaves
- Only host plant for the threatened Oregon silverspot butterfly larvae

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

## **Spiders – Orb weavers (predator/prey, carnivore) specimen, photo**

- Creates web of sticky and non-sticky elastic silk to capture flying insects, and rarely small birds.
- May create a new web each day, sometimes eating the old one

## **Rufous Hummingbird (predator/ prey, omnivore/specialist) study skin**

- Long slender bill and tongue designed to extract plant nectar. Also eats insects, spiders and tree sap.
- Roosts and nests in trees and shrubs
- Uses spider silk, moss and lichens when nest building

## **Porcupine (prey, herbivore/specialist) skull, claw, quills, footprint image**

- Strict vegetarian – eats leaves, buds, twigs, young bark and cambium
- Mostly nocturnal
- Gnaws antlers and bones for calcium
- Sharp, curved claws, bumpy soles and quills on the underside of tail help it climb trees



Oregon Silverspot Butterfly



Roosevelt Elk



Snowshoe Hare



Coyote



Barn Owl



Long-tailed Weasel

**Oregon Silverspot Butterfly (herbivore, specialist) photo**

- Threatened species, last seen on peninsula in 1990
- Larvae only eat early blue violet leaves
- Feeds on nectar as an adult

**Roosevelt Elk (prey, herbivore/generalist) antler, tooth, scat**

- Grinding teeth to eat grasses and forbs, twigs and woody vegetation
- Diurnal and crepuscular, sometimes nocturnal
- Elk are some of the most adaptable grazers – sedges and grasses can make up 80-90% of diet in spring & summer, woody plants and fallen leaves in winter.

**Snowshoe Hare (prey, herbivore/scavenger/generalist) photo/skull**

- Clipping front teeth and grinding back ones to eat grasses, forbs and brush, and alder and willow buds, twigs and bark. Will occasionally eat carrion.
- Runs fast and uses tall grasses and shrubs to hide from predators
- Eaten by coyotes, weasels, snakes, raptors

**Coyote (predator, carnivore/omnivore/scavenger/generalist) skull**

- Sharp eyes, good nose and fast runner (25-30 mph)
- Prefers small animals such as mice, voles, birds and rabbits, but will also eat eggs, amphibians, reptiles, fruits and berries, and carrion.
- Will take larger hooved mammals like deer and fawns
- Sharp teeth for puncturing and slicing

**Barn Owl (predator, carnivore/specialist) study skin**

- Nocturnal – active at night, rests during the day. Barred and mottled plumage helps owls hide during day.
- Strong feet and sharp talons to catch and kill prey. Can rotate third toe to side making a web of talons to catch and hold prey.
- Swallows small mammals (voles), sometimes amphibians, reptiles and insects whole.
- Big eyes for nocturnal vision. So big that they can't move them, so they have very flexible necks.

**Long-tailed Weasel (predator, carnivore/generalist) study skin, photo**

- Fast moving with sharp teeth – catches its prey by pounce, bite and wrapping long body around to slow prey's forward movement.
- Eats voles, mice, snakes. Will take squirrels, rabbits and shrews as well.