



Pacific Northwest Plants and Animals

Module 4: AMPHIBIANS and REPTILES



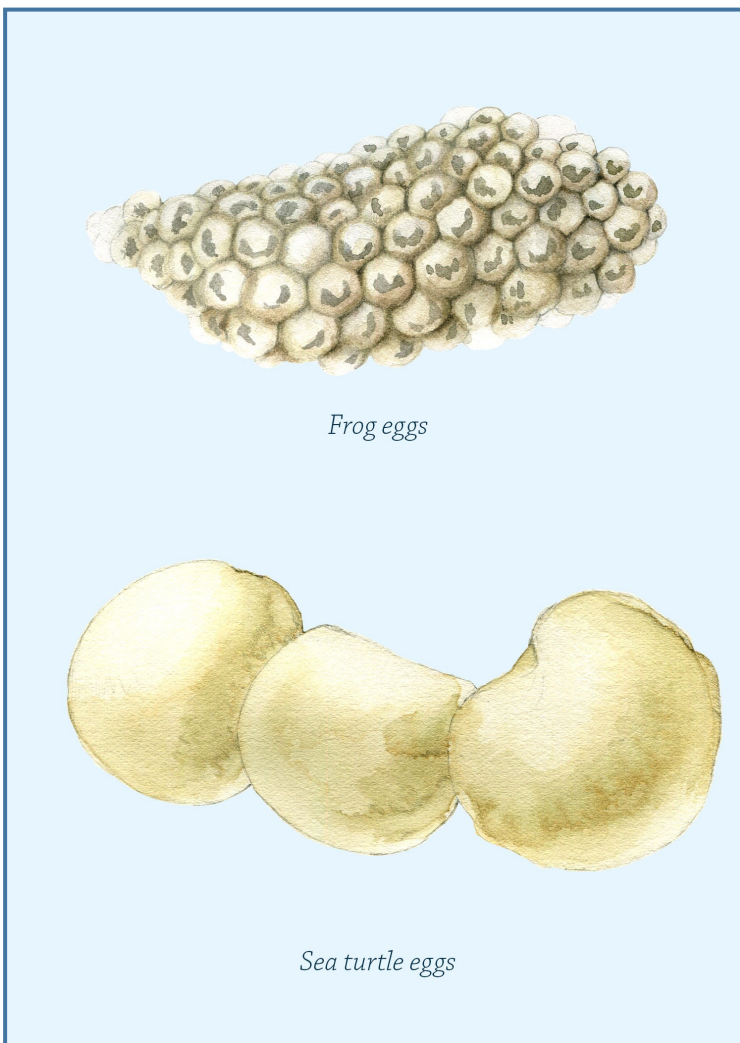
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Chapter 4: Amphibians and Reptiles

The history of amphibians, reptiles, and even our own species, is an epic journey through time. But exactly how long? A hundred years ago? A thousand? A million? Well, what about **380 million** years ago?

Why so long? Well, everything just seems to take a lot longer than we think it should. Just think about how long it takes to get ready in the morning—or do a math assignment! It takes *time* to move continents, make new species, and change the world.

Between 416 and 359 million years ago, the Earth started to change. This time period is called the Devonian. Somewhere around 380 million years ago, the first amphibians began making their way onto land, making them the first animals with a spine to do so. They were able to do this because they had developed lungs - allowing them to breathe oxygen by getting it straight from the air. This was a huge advantage because the oceans were running out of oxygen. Amphibians then, and even now, needed water to lay their eggs. Their eggs are soft and gooey. Without a shell to protect them, they will dry up and die. So remember—if you are trying to find an amphibian, find water first!



After the amphibians made their way onto land, some of them started to change again. Some created eggs that had a leathery or hard shell. This one adaptation gave rise to the reptiles. Reptiles first appear in the Carboniferous period (359.2 million years to about 299.0 million years ago).

As fossils go, they are easily recognizable because they laid eggs, had distinctive skulls, and were far from water. Laying eggs that did not need water let reptiles move into new lands. They quickly spread across all of the lands they could.

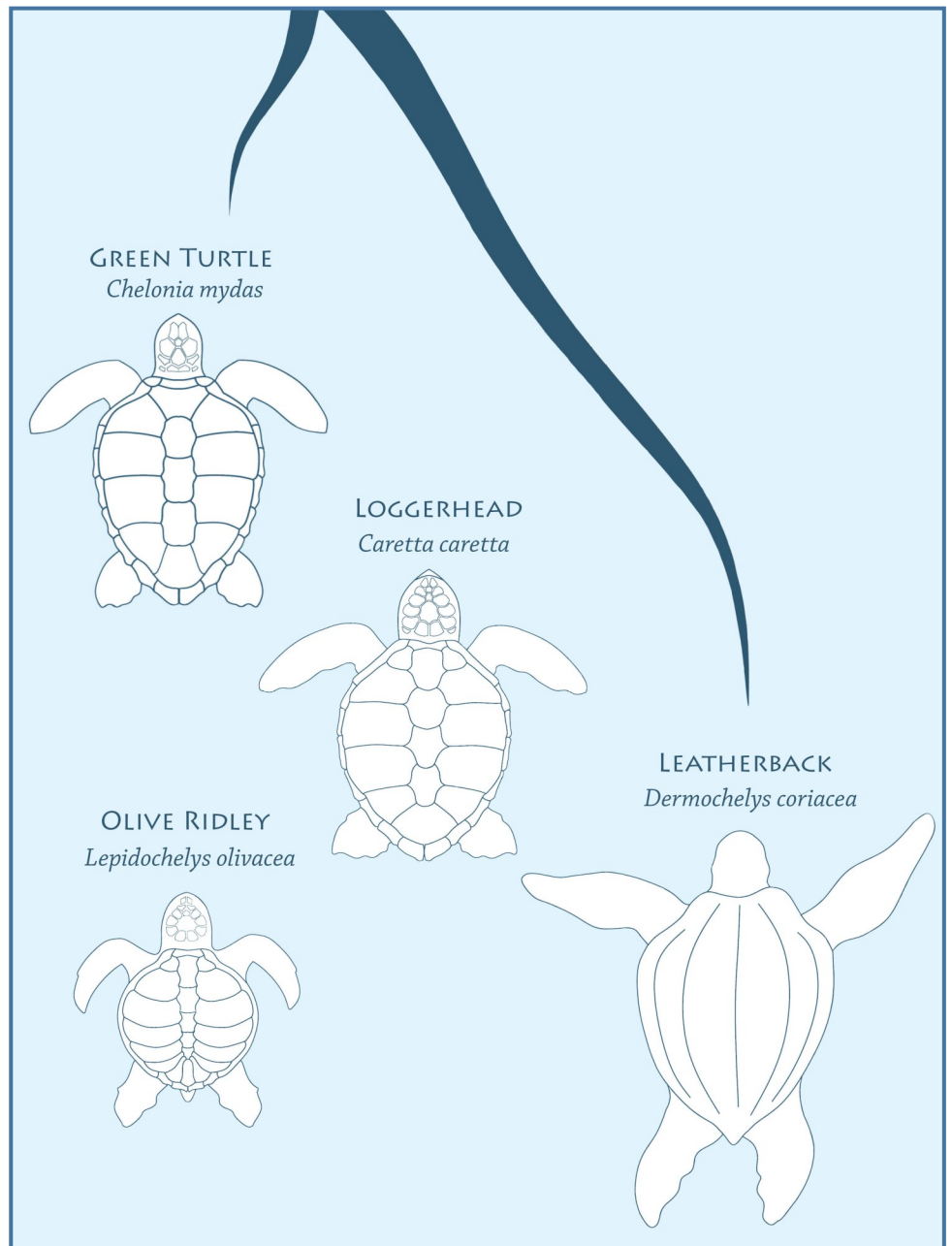
*Figure 4-1. Frogs and other amphibians lay their eggs in slippery piles called **masses**. Turtles lay individual eggs in a large group. Though solid, turtle shells aren't hard like a chickens egg. They are soft and allow air to pass through.*

Today, we still have amphibians and reptiles. In fact, scientists are still arguing over whether or not turtles are part of that first family of recognizable reptiles. Why? Because of the shape of their skulls. The earliest reptiles had mostly solid skulls. The only holes were for the eyes. Later, other species developed more holes – but turtles didn't. Or maybe they did and later went back to a more solid skull. Until we figure out if the turtles are part of that original solid skulled family or developed them later, the debates will continue. Stay tuned!

We do know that recognizable amphibians and turtles have been around for millions of years. We also know that the relatives of modern sea turtles show up in the fossil record around 110 million years ago. By 90 million years ago, the ancestors of the Leatherback, also called *Archelon*, were the scariest hunters in the sea. At about 20 million years ago, new marine mammals began taking over the seas - and they became the scary hunters!

Whales and dolphins began eating giant *Archelons* and other turtles with rubbery type shells. Worse still, if they weren't eating the turtles, they were eating the plants and animals the turtles needed to survive! Of all the turtles with softer shells, only the Leatherback we know and love today survived. For *20 million years!* Today, it is the only turtle that belongs in the *Dermocheloid* or the skin shelled turtle line.

Figure 4-2. There are seven different species of sea turtle swimming around in our oceans right now. But, only the four shown here live in, or routinely visit, the Pacific Northwest. The size, and shape, of a turtle helps determine where it can find food. Leatherbacks have a lot more mass and blubber to keep them warm in colder and deeper waters.



Hard-shelled turtles and tortoises are related to the Dermocheloids—but those hard shells put them in a different line. They are known as Chelonians. Chelonian basically means “shelled”. When you are trying to remember where the turtle you study belongs – think about its shell and it will guide you well!

Amphibians

Before we jump into a whole new topic, let’s go over what we know so far. Amphibians are the first animals with spinal columns (also called vertebrates) to survive as land animals. Their eggs were and are fragile and gooey and needed water, and some amphibians developed into the reptile family.

The class “amphibia” only includes three orders: frogs and toads (Anura), salamanders and newts (Caudata), and the caecilians (Gymnophiona). The word Caecilians looks like a lot to say – but don’t let it worry you. It sounds like *say-silly-yuns*. Caecilians might get confused for worms because they don’t have arms or legs. We also don’t need to spend a lot of time studying them right now because they live in the tropics.

The frogs, toads, salamanders, and newts in our region have great camouflage, so they can be hard to find. Making this task harder is their need to keep from drying out. They only go out in wet areas, shadowy places, or at night. Sometimes, they will use the sun to warm their bodies, but it is dangerous. Using a sunlit spot of shallow water is a safe place to get cozy.

Amphibians and reptiles share the ability to hibernate when the weather turns cold. Both are “cold-blooded” which means they can’t quite control the temperature of their own bodies and need a little help from the environment. If it’s too hot, they can climb into the shade or water. If it’s too cold, they can bask in the sun – carefully! But what about winter when even in direct sun it is still too cold? Or summer, when the sun is impossibly hot? Time to hibernate! Well, technically it’s called “estivate”, but they dig their way into the ground and wait it out.

Curious to learn more?

Check out this fun video about fish learning to breathe air:

<https://www.youtube.com/watch?v=E1h4kgt2520>

And this one about the earliest days of amphibians and reptiles!

<https://www.aquarium.co.za/blog/entry/where-did-sea-turtles-come-from>

Oregon spotted frog

Rana pretiosa

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Amphibia*

Order: *Anura*

Family: *Ranidae*

Genus: *Rana*



Length: body length 1.74 – 4 inches (approx. 10 cm)

Weight: --

Appearance: The spotted frog changes color throughout its life. As young frogs, they are mostly green, brown, or reddish. By the time they have grown up, most of their body is red – and is brighter too. No matter what age, the spotted frog – has spots. The black dots have light centers and are often over areas of lumpy skin. As the frogs mature, these spots get a little fuzzy around the edges.

These frogs love water! So much so that they are almost always found near lakes, ponds, and wetlands. They also like plants that they can hide in or even use as floating beds for resting. As tadpoles, they eat bits of dead animals and algae. They have sharp teeth that helps them pull the outer skin off plants too. They turn from tadpoles into frogs in their first year. By age three, they are ready to become parents too.

Why are they disappearing?

The Oregon spotted frog used to live over most of the Pacific Northwest – from northern California all the way up into British Columbia. Now, they can only be found in about 22% of the area where they used to live. Another way to think of that is like someone taking a dollar from you – and leaving you with one quarter. You might be able to do something with \$1.00, but it is a lot harder to do anything with only \$0.25. Some estimates place their habitat loss in the American west at 95% which is even more worrisome.

Like so many other species we have studied, or will study, the threats to this frog are mostly caused by humans. By now, you should be pretty familiar with the list: habitat loss, pollution, development, ditches and dams, and livestock grazing. But, there are also other causes like introduced species. Bullfrogs were introduced into the area and they eat a lot of native animals. Invasive plants like reed canarygrass choke out native species and that impacts what insects, birds, and other life can live there.

Northern leopard frog

Lithobates pipiens

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Amphibia*

Order: *Anura*

Family: *Ranidae*

Genus: *Lithobates*



Length: 1.97-4.37 in (5-11 cm)

Weight: 1.021 oz (29.02 g)

Appearance: The name leopard frog is a good indicator of what to look for when searching for these beauties. They have two main rows of spots down their back with at least one spot in between the lines. Their spots have a yellowish-white halo. They are also known for spots on the inside of their eyes and a single spot on their snout. They have creamy white undersides. Their dominant color can be a bright green, tan, or brown.

The leopard frog is usually found near permanent water sources. Unlike many other amphibians, this species will drift away from the water after the mating season. Sometimes, they will make a new home in a meadow. That is how they earned the nickname “meadow frog.” As tadpoles, they eat small foods like algae. As they get older, they eat larger animals and have been known to eat other, smaller frogs. But, they mostly eat insects, slugs, worms, and spiders.

There are about 20 species that regularly feed on the leopard frog! These include foxes, herons, pike, bass, hawks, gulls, and some snakes – and even leeches. Diving beetles are a threat to tadpoles. To survive these predators, the leopard frog developed a color pattern that helps it to disappear in the environment. They are also super-fast escape artists!

Curious to learn more?

Check out these videos from the Washington State University and the Oregon Zoo. These researchers are helping the Northern Leopard Frog recover!

<https://www.youtube.com/watch?v=rnRuvGO7OcA>

<https://www.youtube.com/watch?v=5A6HQp9kYjk>

Why are they disappearing?

It is always hard to point at a single cause for the loss of a species. The disappearance of the species in our region is no exception. It could be a combination of reasons. In the 1960s, a bacterial infection killed off a lot of these frogs across the country. In most areas, they have been able to recover somewhat. Which leaves us wondering why they haven't recovered here.

We do know that invasive bullfrogs species are eating quite a lot of them. Like other species, they have lost most their habitat and are struggling to find safe places to live. Other possibilities include pesticides in the water or changing water quality that kills off eggs. Cars are quite dangerous for them as well, particularly in Canada.

Since their primary role in their ecosystem is to control insect and other populations, what has happened to the health of our forests since they disappeared? What don't we know?

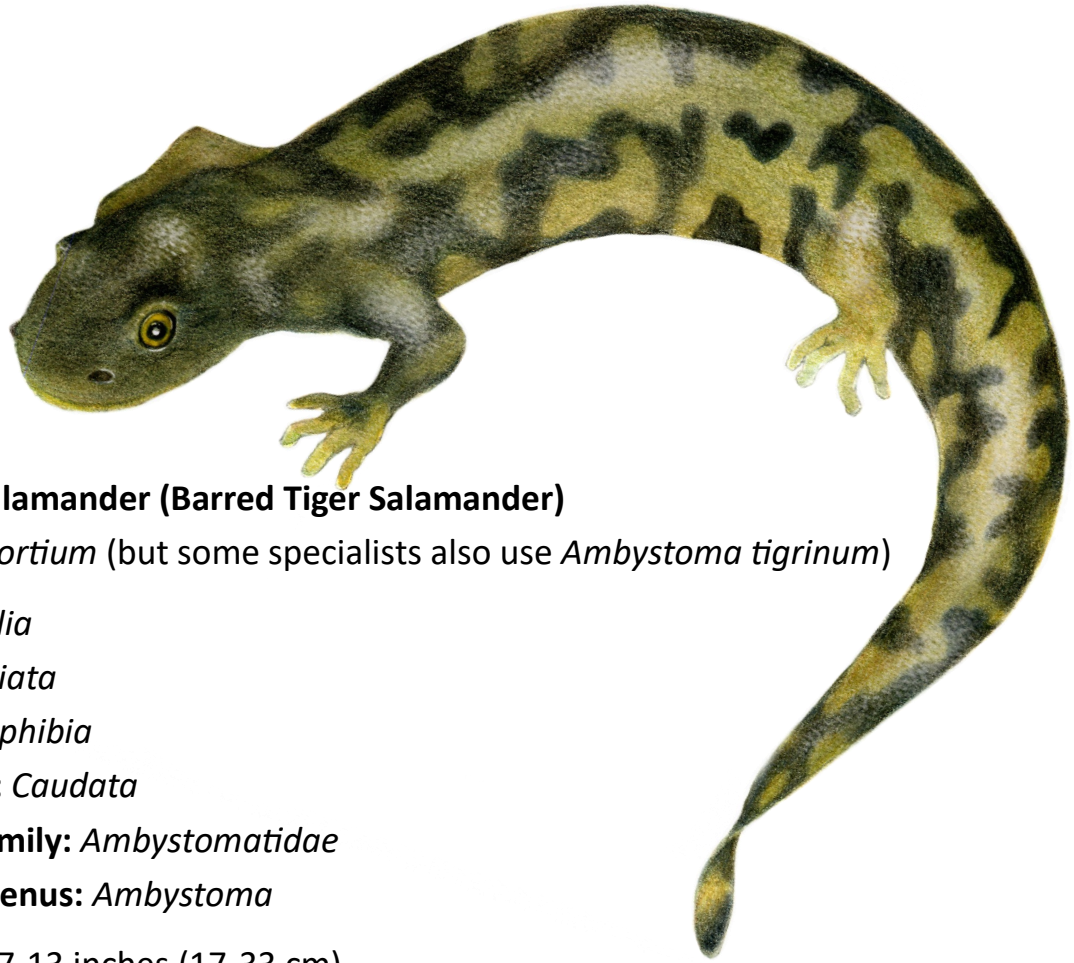
How do we know about these species?

To identify species from archaeological sites, researchers compare animal and plant remains to known specimens that exist today. It is like those matching games where you have to find two cards that look exactly same. Once you find bones that are an exact match, the species is identified!

Not every bone in an archaeological site was an animal that lived with humans—like their dogs or horses. Some weren't even the foods they ate. Some just get there on accident. Rain storms can wash in dead animals. Predators like coyotes and bears might drag parts of an animal to a new place to eat. Sometimes, rodents just die in their burrows and are uncovered later.

So, does that mean only some bones in a site are important? Well, some will definitely be more important than others, but all bones have a story to tell. If the animals were eaten by humans, the bones will have slender cut marks made by sharp tools to slice off meat or they might even be shattered to get at the gooey marrow inside.

Even the animals who died or ended up at a site on accident can teach us a lot. Little animals like rodents, lizards, and amphibians, live in small home ranges with specific environmental conditions. If we find their bones at a site, we can easily understand what that site looked like when they lived there, and that tells us how the world has changed, or stayed the same, over thousands of years.



Western Tiger Salamander (Barred Tiger Salamander)

Ambystoma mavortium (but some specialists also use *Ambystoma tigrinum*)

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Amphibia*

Order: *Caudata*

Family: *Ambystomatidae*

Genus: *Ambystoma*

Length: approx. 7-13 inches (17-33 cm)

Weight: 4.4 oz (approx. 126 gms)

Appearance: The western tiger salamander is only one name for a group of these amazing – and big – salamanders! Before you get too excited, when we say big for a salamander in the Americas, we are talking about something like a good-sized banana or a bit longer. They are shaped a bit like a banana too. They have chunky heads and tiny eyes that stick out.

Since these salamanders belong to a big and confusing family, their descriptions often try to include every variation. For you, that would be like describing every member of your family in just a few words! So, be patient with me and let's give this a try.

Keep in mind that this salamander and all its close relatives (or subspecies) live across most of the north American continent. They live in desert areas *and* in high-elevation glacial ponds. This means that their appearance changes depending on where they live. But some things are common to all family members. As young salamanders, they have dark and light stripes on their sides. When they grow up, their color is not as bold but they do keep a variety of blotches, bars, or stripes, on their sides. Their backs tend to be anything from beige to almost black in color. Their splotches fade to a kind of muddy yellow color. Perfect camouflage!

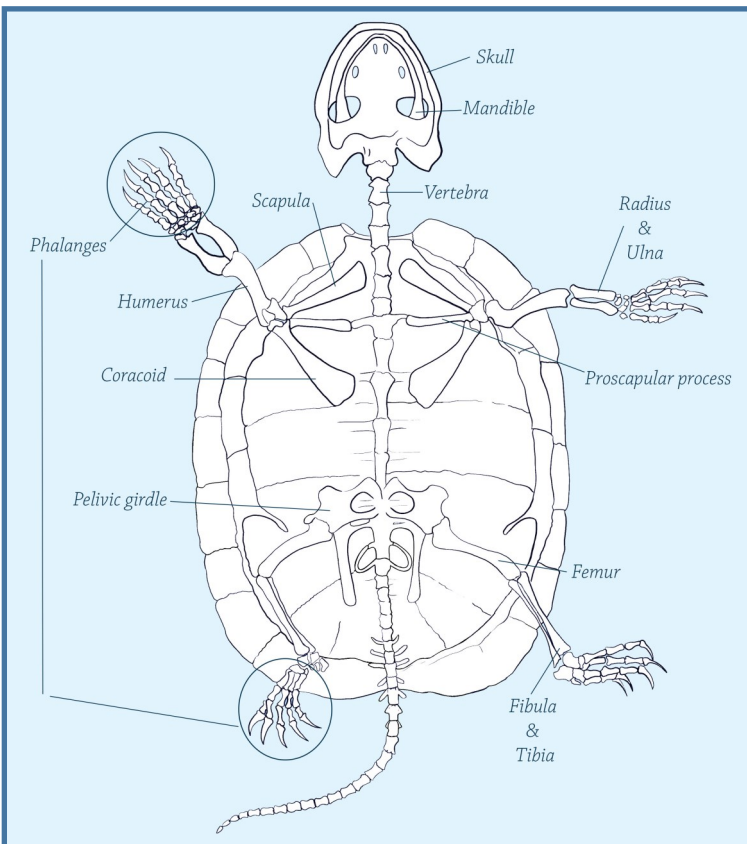
Why are they disappearing?

These large salamanders do well in high mountain lakes. Well, at least until the ponds are stocked with trout. The trout love to eat the young salamanders. At that stage, they are called larvae. When they can successfully hide from trout, their chances are a lot better. They also face an unusual threat – poo! That’s right, grazing cows and sheep tend to poo everywhere. A type of bacteria linked to the...uh, dung...gets into the water and harms the young salamanders. There is also the chytrid fungus that seems to be a player in their decline. This fungus has caused the death of a lot of amphibians around the world.

Salamanders also make great fish bait so some people catch them for a living. Worse than that, some people have put other types of salamanders into the places where the western tiger salamanders lives. Now, how is that supposed to work? There just won’t be enough food for everyone!

But, it is important to remember that poo, trout, and a fungus, aren’t the biggest problems the salamanders face. Their biggest threat is the loss of habitat. Cutting down forests and draining wetlands leave them without homes.

You know when you are just having a really bad, no good, kind of day? Then another bad thing happens? Then another? Then another? That is what is happening to these salamanders - and most of the species in these modules. They just can’t catch a break. But, if you think about it - there are a lot of ways humans can help these species out!



Turtles

Before we get too far into any discussion about turtles, we need to talk about what a turtle is. Take a deep breath... and here we go! All tortoises are turtles, but not all turtles are tortoises. Wow, that is a bit confusing! What does it mean?

Figure 4-3. A lot of animals have similar skeletons. If you look closely at this land turtle, you will see it has most of the same bones you do. They might look a little different, but that is ok. They are meant to do different jobs.

You don't have a proscapular process—but you do have a coracoid. But, your coracoid doesn't work the same as it does in other animals. See if you can figure out how much you share with this turtle!

Like all living things, turtles (including tortoises), are shaped to fit the environment they live in. Tortoises have high domed shells and big back legs for pushing their heavy bodies around on land. Turtles are flatter and that makes swimming easier. Turtles can swim, but tortoises sink. Please, don't try this at home – just trust me! Since tortoises aren't native to the Pacific Northwest, we can focus on who does live here – freshwater and sea turtles.

Turtles come in a wide variety of shapes, colors, and sizes. Land turtles are also called freshwater turtles. They live in or near ponds, lakes, wetlands, and the slower moving parts of streams. Freshwater turtles have webbed feet that stretch wide in the water. On land, they use long claws and paddle shaped feet to move over muddy ground (Figure 4-3).

Sea turtles have long thin flippers that look and work like a bird wing (Figure 4-4). Every bit of a sea turtle is designed to glide through the water. When we talk about cars, planes, or birds, and how they move, we use the word *aerodynamics*. That might be a big word but think about it in smaller parts. Air, or *aero*, is an easy one. What about *dynamic*? It means change. So, air change can be said as *aerodynamic*.

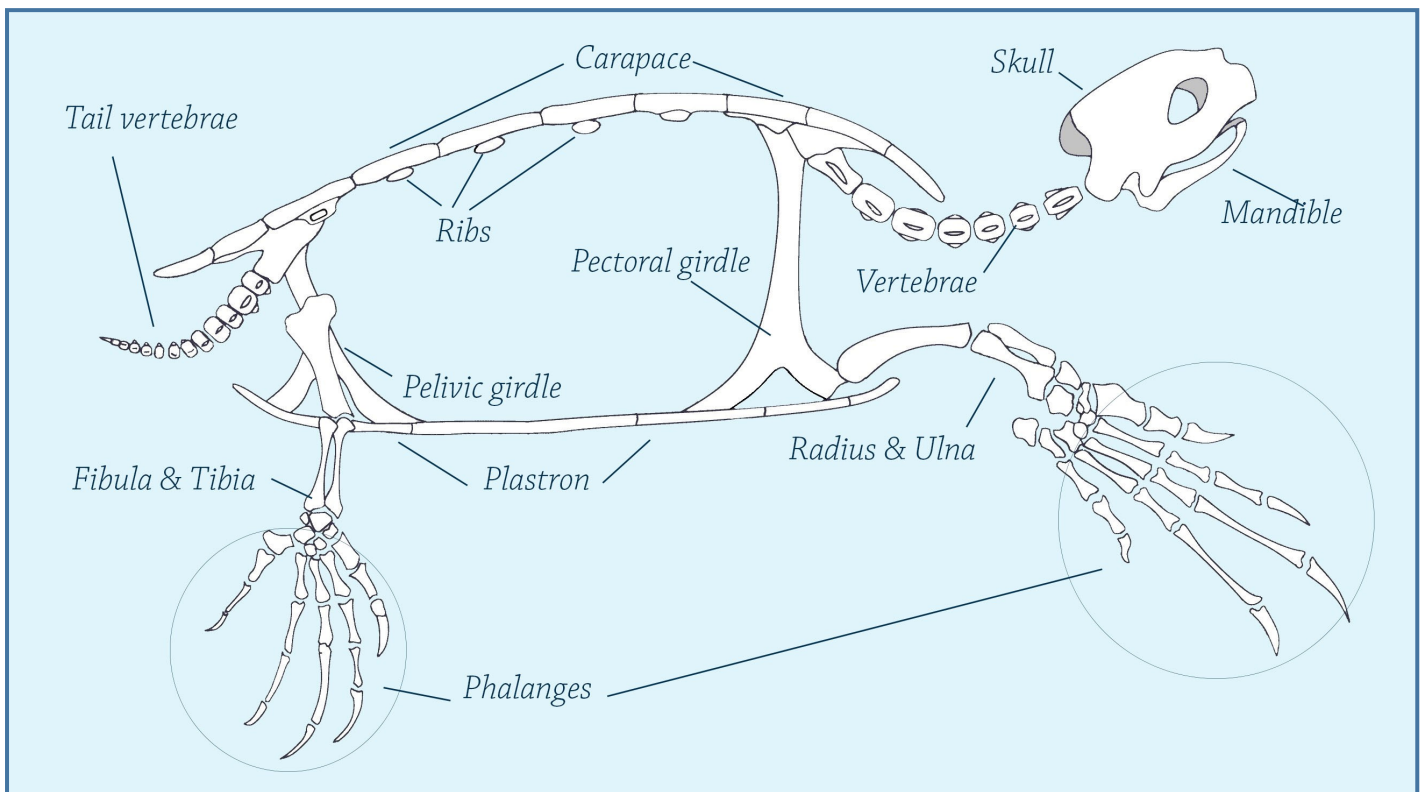


Figure 4-4. This is what most sea turtle skeletons look like. They also share a lot in common with land turtles so some of the names for things are the same. You might have noticed that in both land and sea turtles, the top of the shell is called the carapace, and the big flat plate that covers their stomach is called the plastron. Keep those terms in mind as we continue on, they are important. Most species are identified by the colors, shapes, and even textures of their carapaces and plastrons.

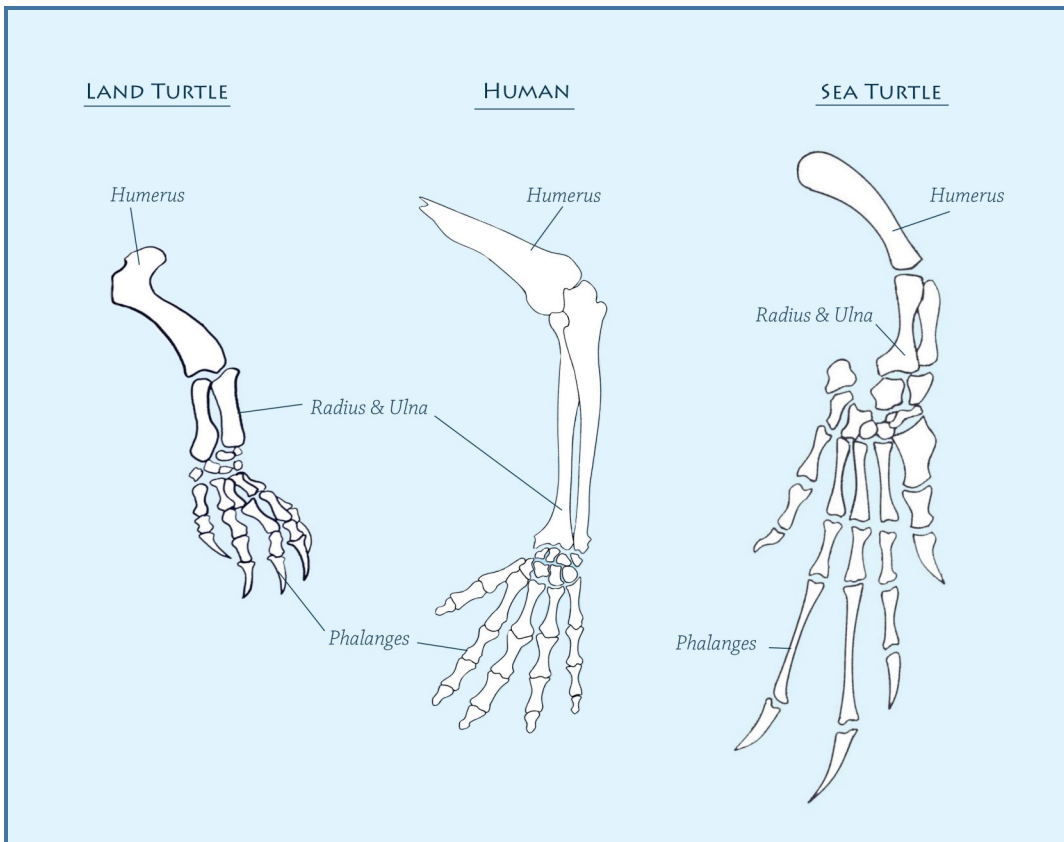


Figure 4-5. Just in case you weren't sure how your skeleton was similar to the turtles we are talking about, here is a comparison.

Check out the different sizes and shapes of individual bones. The turtles are built about the same, but one is better for digging into soil and pulling, while the other is meant to glide through the seas.

Human arms are made to do a lot of different tasks, so while they are made of the exact same bones, they are longer and move differently at the shoulder and wrist. Most important, our fingers move independently—unlike flippers.

All the rules that apply to air and the way it moves around something, also apply to water. Only we can't use the same word so instead we say *hydrodynamics*. Hydro means water. Instead of air dynamics, we are saying water dynamics.

We've all heard *hydro* in our daily lives. I bet you even have a *hydro* flask nearby. Our parents are constantly trying to get us to drink water, so we stay *hydrated*. We have all eaten *dehydrated* food, like beef jerky or fried fruit. So, we are already familiar with the idea of fluids and we know the basics of how water moves. Now, we need to think of water like air and turtles like birds.

Sea turtles use their flippers to swim almost the same way birds use their wings to fly. By moving their flippers in a big figure 8 shape, sea turtles *push* and *pull* their way through the water. This means that they fly through the oceans. They use their back feet to steer their flight.

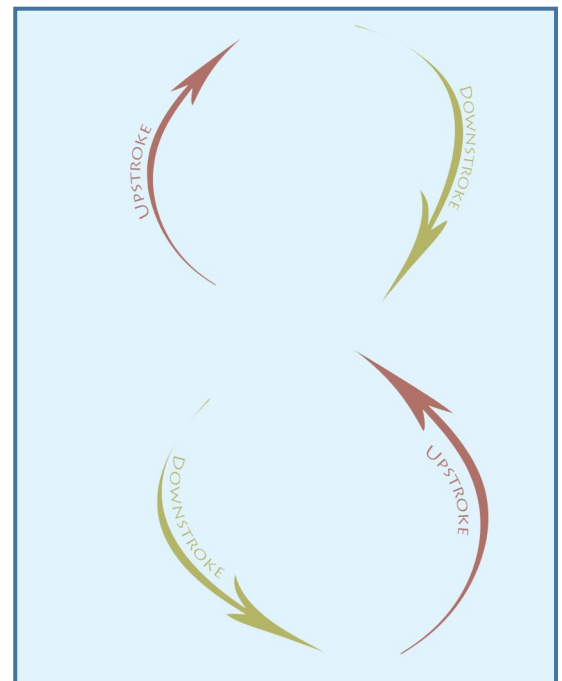


Figure 4-6. Have you ever tried to fly through the air like a bird? While we not be able to fly, we can do a decent imitation of a sea turtle by making the same motions under water. It's ok to practice on land, just remember to rotate your thumbs in and then push a bit forward and down to get the swim started. To keep going, you will need to put your thumbs out and pull back and up. Keep thinking about your hands as cups moving the water!

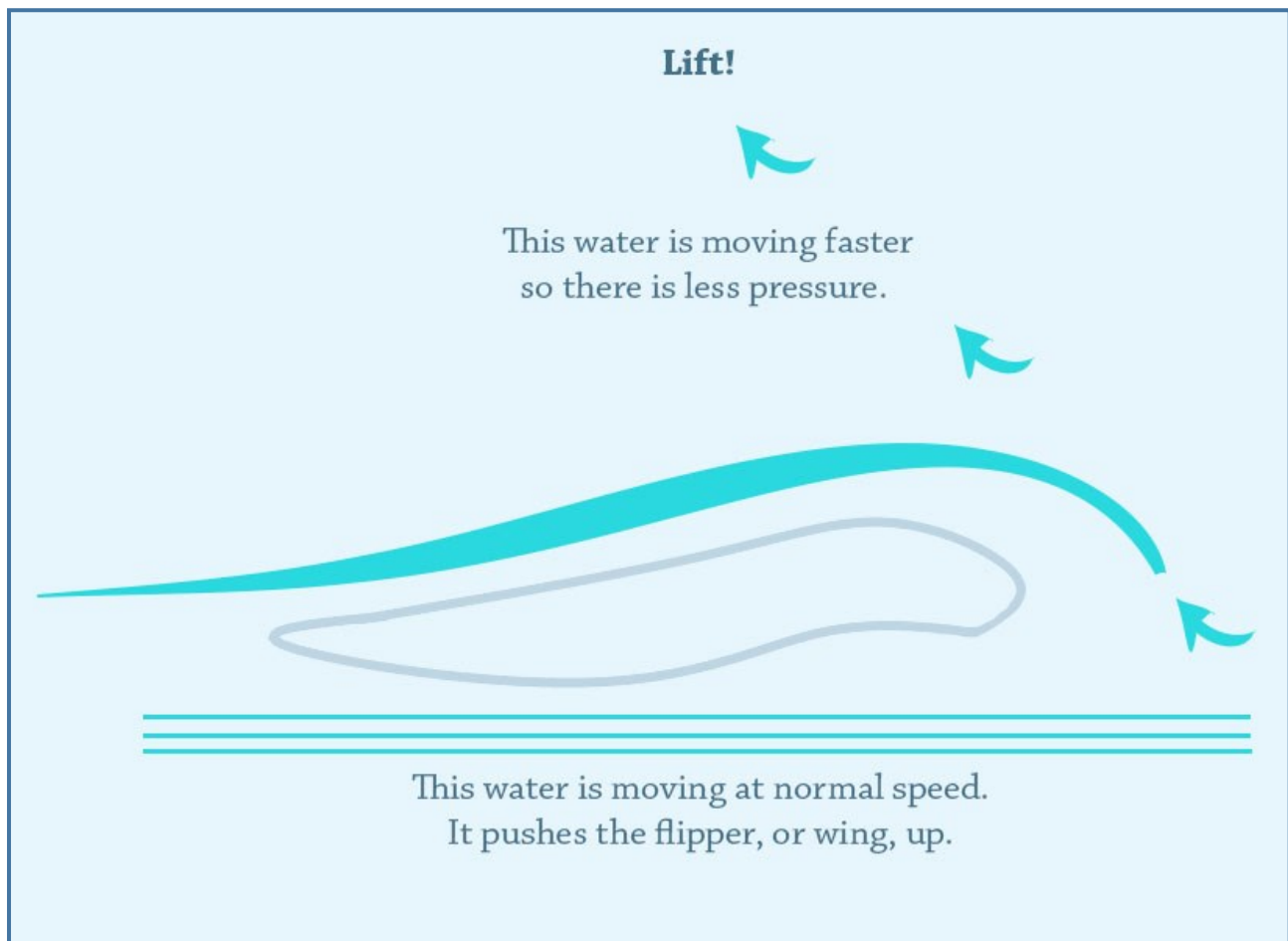


Figure 4-7. Chances are you have let your hand float in the breeze rushing past the side of a car while going somewhere. This picture shows how the air moves around your hand—and it explains why every so often your hand gets tugged up high, or pushed down low. It is all about the speed of the air above and below your hand. Or, in the case of turtles and birds, flippers and wings. When the air above your hand is moving really fast, your hand will fly up. Try playing with the wind when you go places. See how changing the shape of your hand will cause it to lift, drop, or veer from one side to the other.

Freshwater Turtles

There are two at-risk freshwater turtles in our region. If you have spent time near a lake or pond, you have probably seen a western painted turtle. You might not have found a western pond turtle though and they are worth discovering! But, be careful – they are super shy and jump into the water if scared.

Although freshwater turtles spend most of their time in the water, they also enjoy long hours basking in the sun. Time in the sun helps control their body temperature and the growth of algae and other things on their shells.

Both species do best in shallow or slow-moving waters where they can eat. They also like places with a muddy ground surface. The soft mud gives them places to hibernate during cold winters.

Western painted turtle
Chrysemys picta

Kingdom: *Animalia*
Phylum: *Chordata*
Class: *Reptilia*
Order: *Testudines*
Family: *Emydidae*
Genus: *Chrysemys*

Length: 3.54 – 9.84 inches (9 – 24 cm)

Weight: average adult 13.10 oz (371.8 g)



Appearance: Their smooth oval shells are dark green or even black. The edges of the carapace and plastron are brightly colored with yellow, orange, or red patterns. The females are larger than the males. If you can't remember what a plastron or carapace is, check over Figure 4-4 (Page 10), for a quick refresher!

Young western painted turtles tend to eat more meat than adults. They will eat small animals that have shells like crayfish or snails. Other favorite foods include small fish, tadpoles and insects. Sometimes they eat other dead animals. When they get older, they mostly eat different types of algae and leaves.

Why are they disappearing?

You should be able to find the painted turtle easily enough in the southern areas of the Northwest. In British Columbia, they are considered as a threatened species because of extensive habitat loss. In the southern areas of the region, they are mostly in danger from cars and habitat loss. Other threats include invasive species, like bullfrogs, that eat them and their eggs. Unlike many of the other animals in these modules, these turtles could be harmed by people who collect them for sale as pets.

FUN FACT!

These turtles are often eaten by fish – especially the largemouth bass. If caught, they can sometimes fight their way free using their long, sharp claws!

Western pond turtle
Actinemys marmorata

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Chelonia*

Order: *Testudines*

Family: *Emydidae*

Genus: *Actinemys*



Length: 6-8 inches (15-20 cm)

Weight: average adult 1–2.4 lbs. (445-1100 g)

Appearance: Males and females have slightly different shells. Males have flatter shells and females have more rounded, dome shaped carapaces. Both share the same coloring. The color of their carapace is usually brownish or black. This muddy appearance helps them blend in with their habitat. Their plastrons are yellow and black. The color of their skin is dark – like the shell – but with yellowish speckles. Males have a yellowish patch on the underside of their throats.

Western pond turtles are omnivores. If they can catch it, chances are they are going to eat it! They eat a wide variety of foods including insects, tadpoles, leeches, small fish, snails, and water beetles. Like the western painted turtle, they also eat algae. Unlike the painted turtle, they also seem to eat tule, lily pod plants, and cattail roots.

Why are they disappearing?

In 1993, a disease killed off all but 100 western pond turtles in Washington. They have had a hard time recovering. They are also struggling with poor water quality. Development and draining of wetlands is making it difficult for individual turtles to go where they might find others. That means making the next generation is getting more difficult. They are also being eaten by bullfrogs and largemouth bass.

Curious to learn more?

Check out this conservation program at the Oregon Zoo to help head-start young western pond turtles!

<https://www.oregonzoo.org/conservation/conservation-program/conservation-program-western-pond-turtles>

What do we know about these species?

The Oregon spotted frog, western tiger salamander, western painted turtle, and short horned lizard have all been found in one archaeological site near the town of Weiser, Idaho.

Evidence suggests these species have lived on, or near, this site for about TEN THOUSAND years! Maybe they didn't all live here at the same time, but they have all shown up there. So, what does that mean? Well, these animals have successfully been able to live in that area in a fairly continuous manner for millennia. Some of the animals are still found nearby, BUT they are risk.

One change that might be for the better involves our friend, the western painted turtle. It looks like this is one species that might enjoy some of the changes—it isn't used as food anymore!

Sea Turtles

It might feel a bit odd to be talking about sea turtles since our ocean waters are so cold. If we do see a sea turtle on our beaches, it is probably sick or dying. Healthy turtles are safely out at sea feeding. Those that wash up are usually cold-stunned. Sea turtles are sensitive to water temperatures and like to be warm.

When they feed, they follow warm currents and at times that brings them north into our waters. Normally, this isn't a problem, but in the winter months, the temperature can change quickly. It is that quick change that stuns the turtles into comas. The cold can do more than shock the turtles – it can cause life-threatening damage to their internal organs.

Unlike freshwater turtles, sea turtles rarely if ever, return to land. The Green sea turtle is the only species known to occasionally bask on sunny beaches. It is possible they sunbathe to help control their body temperature. In all other sea turtles, only the females return to land. When they do, it is a spectacular event. Whether the females go to shore alone or in large numbers to lay eggs, they start the next generation on its journey to the sea. Females don't lay eggs every year. In fact, they may only go every few years. Since it is such a hard job, they need to have a lot of strength saved up. So, the temperature, amount of food available, and kind of turtle, will decide how often they lay eggs.

All sea turtles are born from eggs laid in the warm, sand-covered beaches of the equatorial regions. As eggs, the turtles are fragile and unprotected. They are vulnerable. Humans are their most dangerous predators. Turtle eggs are popular food items. Aside from us, the eggs are eaten by raccoons, crabs, and insects, among others.

After hatching, the baby turtles race to the ocean. They have to hurry because there are predators every step of the way. Here they must outrun night herons, dogs, coyotes, pigs, coatis, and raccoons. They usually wait until nighttime to sprint to the water. This way they can avoid most predators and the hot sands of the daytime. Still, if they are out in the open they might be eaten by terns, frigate birds, pelicans, gulls, and other shore birds.

Within hours of making it into the ocean the tired little hatchlings have already begun making their way to the open sea. They do this by following the magnetic pull in their brains and letting the current carry them along. The hatchlings will all spend time maturing in deep waters before returning to a juvenile feeding ground. Sometimes called the *lost-years*, the deep-water time is also known as the *pelagic phase*. When a turtle reaches adulthood, it begins the long journey back to the beach of its birth and the cycle begins again. If not interfered with, sea turtles can easily live as long as a human.

Leatherback Turtle

Dermochelys coriacea

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Chelonia*

Order: *Testudines*

Family: *Dermochelyidae*

Genus: *Dermochelys*

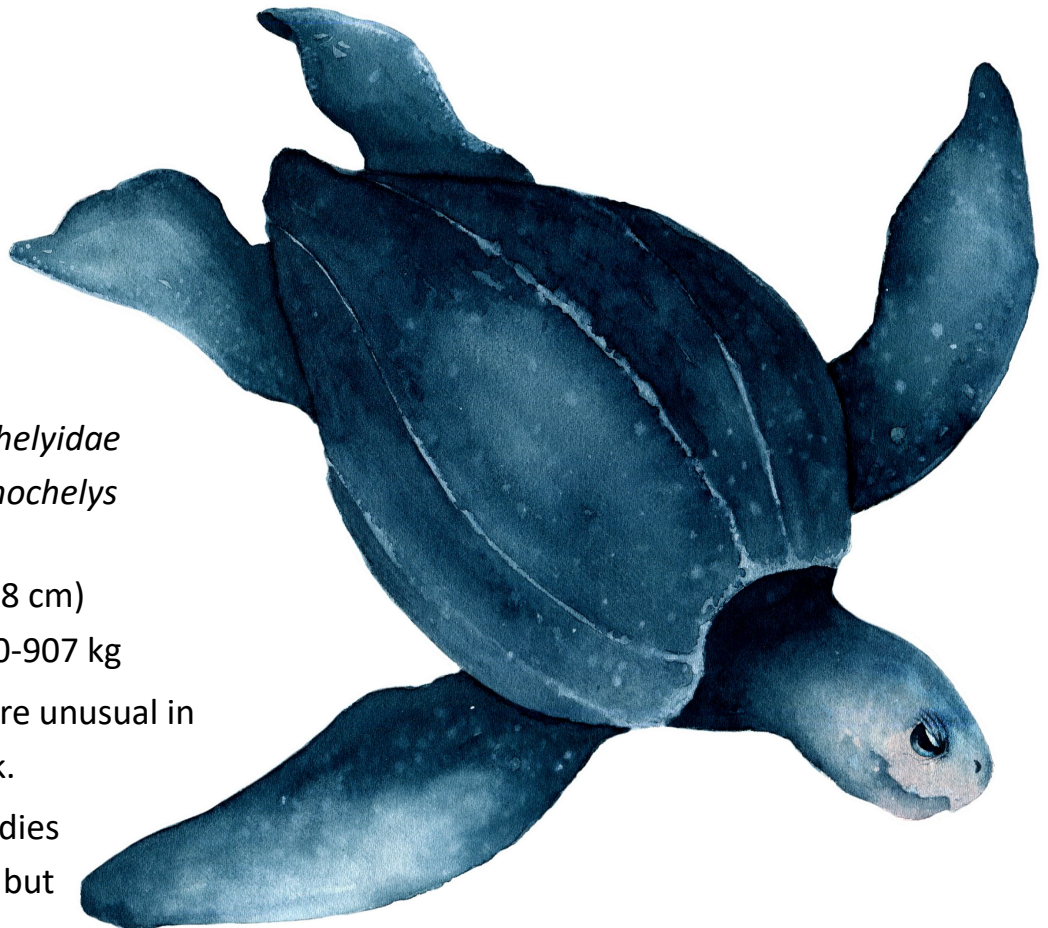
Length: 52-70 inches 132-178 cm)

Weight: 500-2000 lbs. or 250-907 kg

Appearance: Leatherbacks are unusual in that they are almost all black.

Their carapace and upper bodies are dark with white speckles but their plastron and undersides are the opposite.

When they are hot, blood comes to the surface of their skin to help cool them down. This will make some parts of them appear pink at times. Their dark color and the long ridges on their back make them easy to identify.



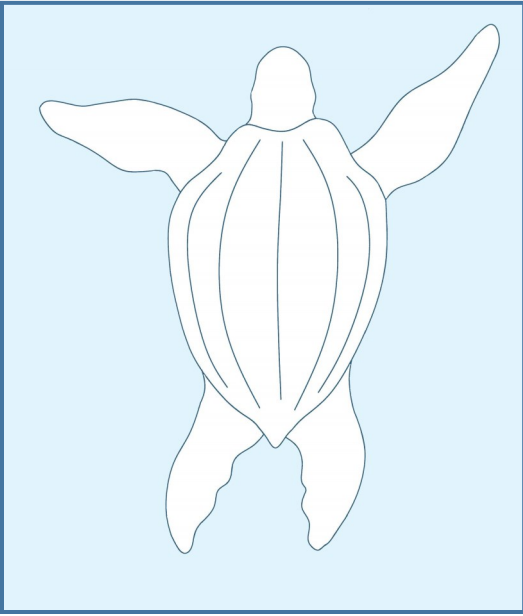


Figure 4-8. Aside from its size and unique color, the leatherbacks are easy to recognize by the long ridges running down their carapaces. All other turtles have scutes and bony plates.

Leatherbacks are the largest of the sea turtles. The shell of an adult male can reach close to 6 ½ feet long – or the average height of an NBA basketball player. These giants consume vast amounts of jellyfish, salps, and other invertebrates to power their long-distance travels. The Leatherback has longer and wider front flippers that make their annual migrations across the globe possible. From tip-to-tip, their front flippers can reach almost 9 feet! That is farther than an NBA player could stretch!

Their size and thick layer of body fat in their carapace protect them from cold waters so they are frequent visitors to our region. In fact, the Leatherback is the only sea turtle that stays in the deep ocean – or pelagic zone. They are rarely found in the warmer waters near the equator unless it is time for the females to lay eggs.

Why are they disappearing?

There is just no nice way to say this - leatherbacks and other sea turtles are dying slow, agonizing deaths because of humans. They are most frequently harmed by our garbage or by being tangled in fishing lines. Leatherbacks struggle to tell the difference between a floating bit of plastic and a jelly fish – so they eat the plastic. Eventually, their bodies fill with garbage that can't be digested and they starve to death. Their feeding grounds are close to where humans fish so they frequently get snarled in long fishing lines, nets, and hooks. As you might imagine, a turtle who can't swim well cannot feed or might even drown.

Some countries still harvest Leatherbacks and their eggs for food.

FUN FACT!

A leatherback turtle has to consume its own body weight in food every day to grow and stay healthy.

Green Turtle

Chelonia mydas

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Chelonia*

Order: *Testudines*

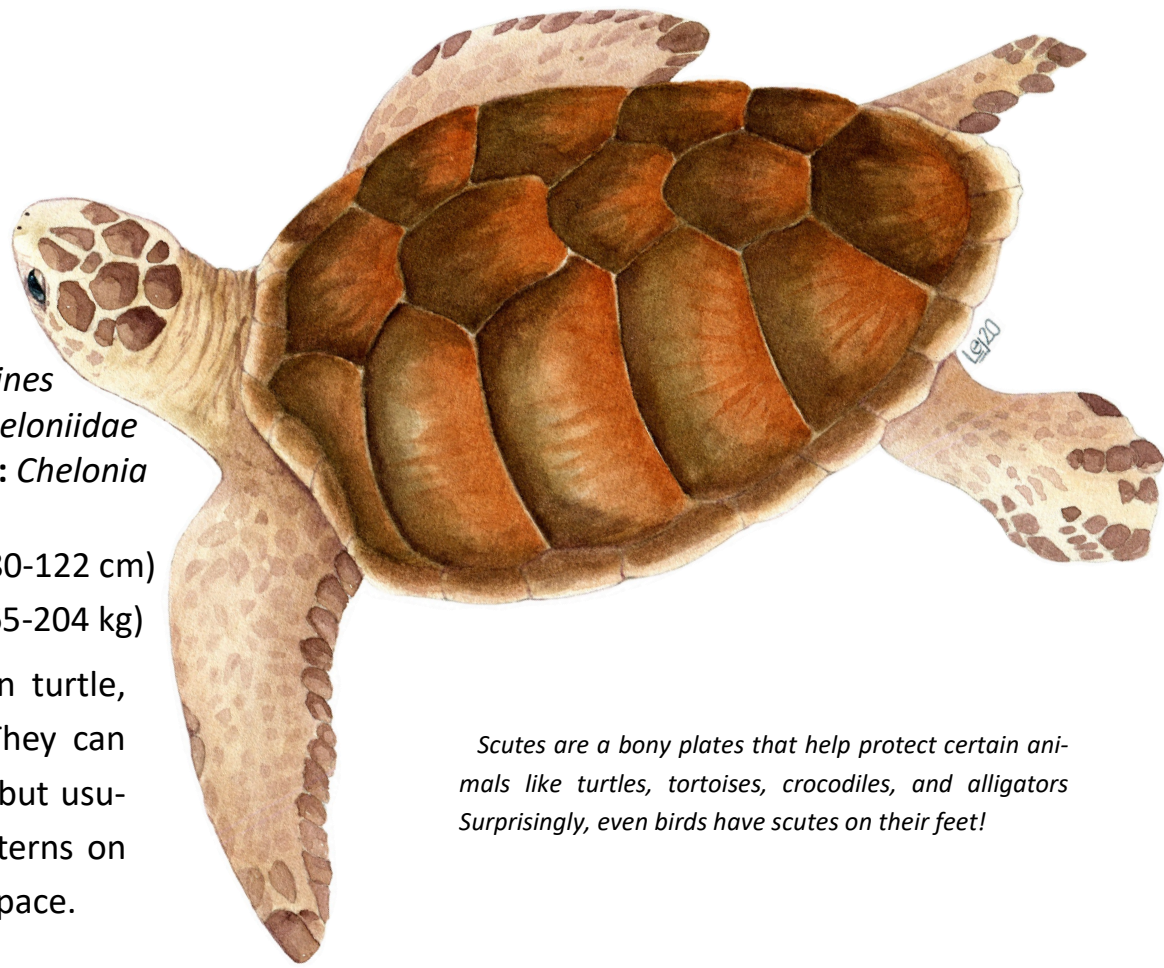
Family: *Cheloniidae*

Genus: *Chelonia*

Length: 32-48 inches (80-122 cm)

Weight: 144-450 lbs. (65-204 kg)

Appearance: The green turtle, is not always green. They can be a variety of colors but usually have starburst patterns on the scutes of their carapace.



Scutes are a bony plates that help protect certain animals like turtles, tortoises, crocodiles, and alligators. Surprisingly, even birds have scutes on their feet!

Their undersides are a soft yellow-white color. These turtles are called green turtles because the plants they eat make their skin and fat green. Of all the sea turtles, it is only the green that feeds mostly on plant material.

Although not common visitors to our waters, the green turtle does find its way here from time to time. Their territory actually covers most of the globe, but they choose to lay eggs in only 80 countries with warm beaches. Their favorite places to nest are Costa Rica, Australia, and Oman.

As young turtles, the green turtle feeds on floating foods like jellies while they are in the pelagic zone. When they return to shallower waters, their diets change to what is available in their area. They are especially fond of seagrasses.

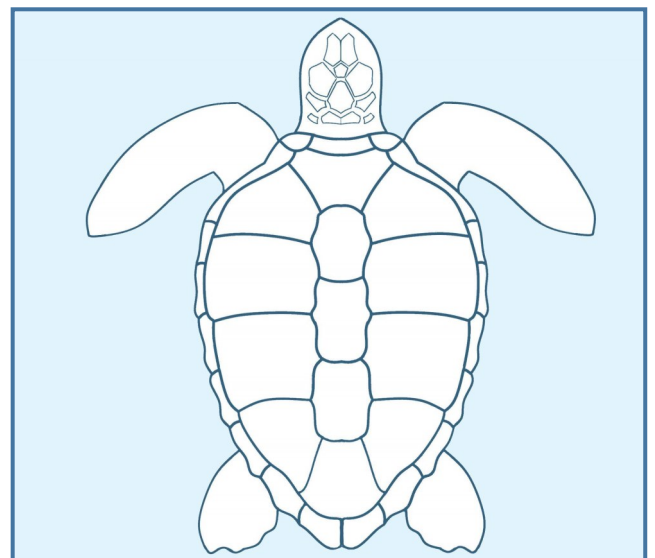


Figure 4-9. The green turtle can easily get confused with the loggerhead. To tell them apart, count the scutes on the side of the body and look at the size of their heads. Green turtles have four scutes and smaller, rounded heads.

Green turtles have a jagged portion on their lower jaw that works like our teeth. They use this serrated edge to groom the seagrass beds and nibble on mangroves. The way that they feed helps maintain the health of the oceans plants and helps them from overgrowing.

Why are they disappearing?

Like leatherbacks, young green turtles eat floating foods like jellyfish eat floating food like jellyfish, which means they sometimes mistakenly eat floating garbage. They also get tangled in nets or other fishing gear. But, the biggest threat to their survival is human consumption of their eggs. In some cases, humans will collect 100% of all the eggs laid in a season – guaranteeing no returning turtles. Within a few generations, entire nesting grounds are abandoned. Green turtles are also highly prized for their meat so they get hunted a lot. Some efforts at turtle farming and banning the sea turtle trade are helping, but time is running out.

FUN FACT!

Green turtles are homebodies! Most green turtles stick to a home territory where they feast on grass and algae. After a long day of grazing, they return to the same place night after night to sleep.

Loggerhead

Caretta caretta

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Chelonia*

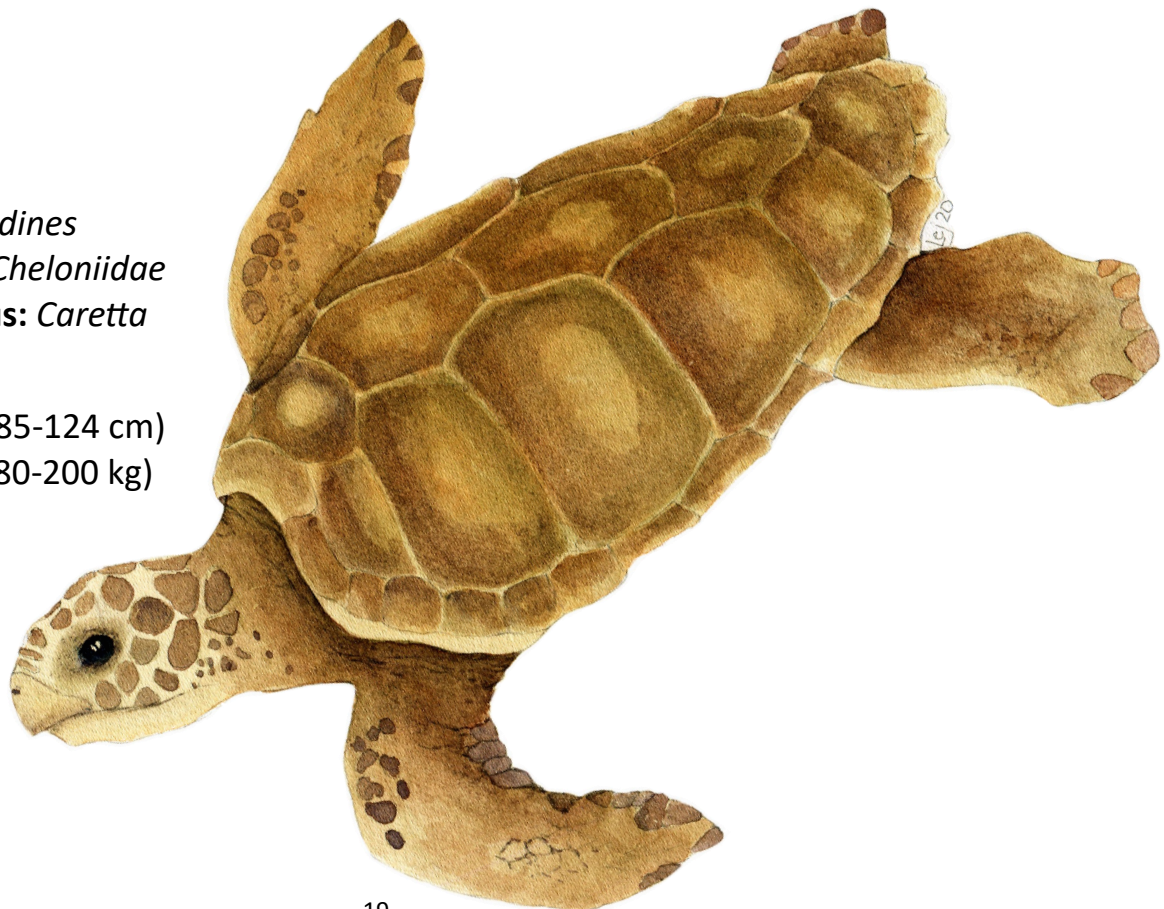
Order: *Testudines*

Family: *Cheloniidae*

Genus: *Caretta*

Length: 34-39 inches (85-124 cm)

Weight: 176-440 lbs. (80-200 kg)



Appearance: In theory, loggerheads are easy to recognize because of their color. Their carapace is a vibrant rust color and the plastron is a paler whitish-yellow. Younger turtles are darker. In some waters though, their colors and territories overlap so you need to look at the scute patterns on their heads and carapace to be sure of which species you are looking at. They do have the name “loggerhead” for a reason. Green turtles have small heads compared to their bodies. Loggerheads are the opposite. They are known for a more oval shaped carapace, big blocky heads, and two pairs of scales on the top of their head.

Loggerheads need that enormous skull of theirs to power through shellfish dinners! Their strong jaws and beaks easily break through the shells of molluscs, crabs, snails, lobsters, conchs, and even barnacles. But, those are just their favorite meals — they also love soft foods like a sea cucumber, sponge, or worms. Sometimes, they have to adapt to what is local in an environment and so might end up eating other things too — and they aren’t above a bit of scavenging.

Why are they disappearing?

Here again, commercial fishing and human consumption of turtle eggs is taking a devastating toll on this population. According to one source, the Australian loggerhead population dropped by 90% since the 1960s. They are not helped by human garbage making its way into the ocean.

Since these turtles will munch on just about anything they come across, plastic is a big threat.

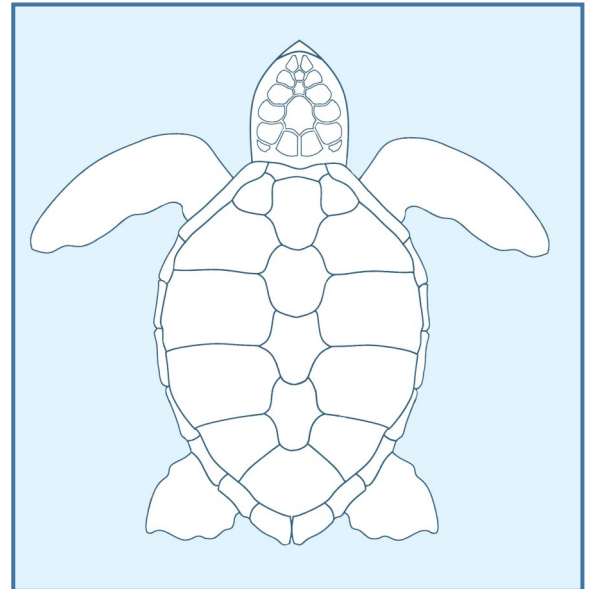


Figure 4-10. Look at the size of that head compared to the green turtle! In addition to having different scute patterns on their carapace, sea turtles can also be identified by the patterns on their heads and necks. Compare the loggerhead to the green turtle and see if you can spot the difference (Figure 4-9, page 18).

FUN FACT!

Sea turtles can’t really swallow since their tongues do not move. Instead of bumps on their tongue (called papillae) like we have, they have big spikes. They are a kind of a strainer to keep food from escaping! Check out this video to see how the papillae work:

<https://www.youtube.com/watch?v=xOBbkLtlgE>

Olive Ridley Turtle

Lepidochelys olicaea

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Chelonia*

Order: *Testudines*

Family: *Cheloniidae*

Genus: *Lepidochelys*



Length: 22-30 inches (55-76 cm)

Weight: 80-95 lbs. (36-43 kg)

Appearance: Like the name suggests, this turtle is mostly olive green or what some might call khaki. Their plastron is a mix of olive green and yellow. They are fairly easy to identify because their shells are almost round compared to the normal teardrop shape of other sea turtles. Also, they are the smallest of all sea turtles. Only growing to about 90 or so pounds, they are tiny compared to a leatherback!

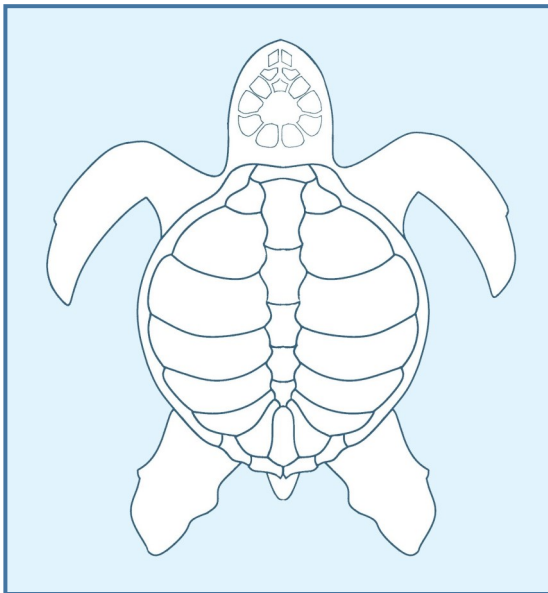


Figure 4-11. The smallest of the sea turtles, Ridleys are also the most round. They are easy to identify by their size, muddy colors, and number of scutes on their carapace.

Like the leatherback, the Olive Ridley is a world traveler and is often seen in Pacific Northwest waters. They even travel to the mainland of Alaska! Although they do frequent our area, they choose to lay their eggs in warmer regions in a truly epic event known as the *arribada* or *arribazon* – which means arrival or the great arrival. During these egg laying events, literally hundreds of turtles compete to lay their eggs on dwindling beaches. The event is so important to the local ecosystem that all of the native species flock to the beaches to eat the turtles and their eggs.

While everyone else in the world seems intent on eating an Olive Ridley or its eggs, they are looking for food of their own. What do they eat? Olive Ridley's are omnivores. They eat a wide range of invertebrate animals like jellyfish, salps, crabs, snails, clams, barnacles, and sea squirts. They will also capture fish or their eggs, and even algae.

Why are they disappearing?

Despite having worldwide territory, the olive ridley only breeds in a few specific locations. The overharvesting of their eggs by humans is the greatest harm to their population. In addition to loss of their young, the olive ridley is running out of good beaches to lay their eggs. Many are being lost to the sea, or are too polluted, or are too crowded with humans.

Lizards

Pygmy Short Horned Lizard

Phrynosoma douglasii

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Reptilia*

Order: *Squamata*

Family: *Phrynosomatide*

Genus: *Phrynosoma*

Length: 3-6 inches (approx. 10-15 cm)

Weight: .14-.19 ounce (4-5 grams)

Appearance: It is rare for scientists to just outright say that a species is adorable, but it is a word that is often used for these little lizards. At just a few inches long weighing no more than a few more dimes, they are sure to get your attention. If you can find them that is! They are usually the color of wherever they are living. They like loose soils that they can easily burrow into if threatened. Their colors tend to be the same as soil - sandy, red-brown, or sometimes a bit grey with some brownish spots on their backs. These spots help them blend in with some of the soil or rocky areas they live in. They have plump little bodies and short arms and legs. Their tails are sharp triangle points. If you like dragons – these lizards are for you. They have loads of spiny scales and like any good dragon, horns to protect its head and neck. In some places, they have been nicknamed “horny toads” because they do kind of look like a spiky little toad. But, you should know from this module that they are reptiles and not amphibians – so nope, not a toad!



These lizards are amazing! They can handle extremely high elevations, which means cold temperatures. Pygmy short-horned lizards have been found as high as 11,000 feet above sea level. That is higher than Mt. St. Helens! It's actually pretty close to the height of Mt. Hood in Oregon. When the temperatures aren't quite comfy enough, they burrow into the ground and doze until the world warms up. They can handle a lot of different terrains but like drier areas. These lizards eat insects, ants, beetles, bugs, and caterpillars. They do have to be on the lookout for birds, squirrels, and even chipmunks, though. Unlike a lot of lizards out there, the pygmy short horned lizard does not lay eggs. They deliver live young.

If you encounter one of these tiny lizards, be careful. They aren't as hardy as you might think with all that armor they wear. If they puff up their body, it is because they are scared and are trying to make themselves seem bigger. So, when you run into one, pay attention to that puffing – if they are afraid of you – it is probably time to leave them alone.

Why are they disappearing?

These lizards have incredibly small home territories. Some reports say a female can live her entire life in a 30 foot space – or about the size of a classroom. Finding other lizards must be hard!

They, like most other species in the world these days, are losing their homes to agriculture or development. While they seem to be stable over most of their home ranges, they are considered to be “extirpated” or extinct in British Columbia. If we aren't careful, this could happen these adorable little dragons in our areas too!

Curious to learn more?

Some members of the horned lizard family can do some crazy things to protect themselves! While our pygmy short horned lizard can't pull off this spectacular move, it does give you some idea of how amazing this family of little cuties can be!

<https://www.youtube.com/watch?v=qqr5k6CzKvA>

Do not try this at home.

Terrifying an animal for an experiment is actually not a common research practice. When used, it is carefully overseen by other scientists to make sure no physical or mental harm comes to the animal.

Desert Nightsnake

Hypsiglena torquata

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Reptilia*

Order: *Squamata*

Family: *Colubridae*



Length: 12-26 inches (30-66 cm)

Weight: --

Appearance: These snakes are basically brown or beige with dark patches and dots, they are often confused with baby rattlesnakes. It is easy to see why! If you aren't sure who you are looking at, try to get a good look at the tail. Remember not to get too good of a look though. A real rattlesnake can strike faster and from farther away than you might think possible! Unlike its sort of look-alike, the desert nightsnake does not have rattles and is only mildly venomous. They do have other physical traits that make them look more dangerous than they are. Their eyes have vertical pupils – just like a cat. Like other venomous snakes, their heads are roughly triangle shaped and their fangs are in the backs of their mouths. Keep in mind, most snakes are pretty much harmless. A bite might hurt like crazy, but the real danger to you will probably be from an infection rather than a toxin. Always use caution when exploring in the wild. Animals really don't want to meet you and they certainly don't want to bite you, but if they are scared they might do it to protect themselves. They usually keep themselves hidden away during the day and go out at night. If a snack wanders by their hiding spot during the day, they will grab it though. When they do go out, they like small animals like mice, birds, and other reptiles. We need them to help control these populations.

A big desert night snake is probably a female. They can be up to three times bigger than a male!

Why are they disappearing?

Over most of its range, the desert nightsnake is doing just fine and we probably don't need to worry. Up here in the northern reaches of the country, things are a bit different. Because we tend to be a little colder than the southern parts of the country, the snakes need it to be pretty warm and dry. These days, their territory is limited and getting smaller. In British Columbia, they are at risk.

They are also facing the usual suspects: urban growth, agriculture, pollution, being run over by cars, and the list goes on. Really, the best way to think of how to protect these animals is to think of ways to protect yourself. Our species can't survive habitat loss or dirty water, air, and dirt. We can't survive getting hit by cars. So, if we look to making life better for us, we will undoubtedly make life better for every species on these lists.

Sharp-tailed snake

Contia tenuis

Kingdom: *Animalia*

Phylum: *Craniata*

Class: *Reptilia*

Order: *Squamata*

Family: *Phrynosomatidae*



Length: approx. 12 inches (30 cm)

Weight: --

Appearance: These snakes are on the small side so actually seeing one might be hard. They are generally dark rust, brownish, or even grey. They have a pale stripe that runs down their sides. The stripe seems to vary from a light cream to almost coral color. On their bellies, they have bands of brighter colors like pale grey, green, cream and sometimes black. You may have noticed their name – sharp tailed snake. They earned this name by having a thorn like tip on their tails. It is a bit odd and no one is exactly sure what is meant to do. Maybe you will be the researcher to find out! Unlike our friend, the desert nightsnake, they are shiny so that might help you find them.

Why are they disappearing?

Their home range in the northern United States and Canada is limited. What little bit of warm land they can find is under development and will soon be lost altogether. Humans can help by thinking more carefully about how we develop land and building in new habitats.

Why use archaeology to talk about animals?

It might seem silly to talk about animals that lived and died at sites a few hundred—or even a few thousand years ago as a way to study species that live now. But, we use archaeology to understand humans from thousands of years ago, why not the plants and animals that lived alongside them?

In the way archaeology explains how humans ate, behaved, and lived, it can help us understand how we co-existed with these animals for thousands of years. More important, it shows us that these animals have played an important part of the natural world for eons, and it is our job to make sure that they are here to continue on.

I have seen some of those archaeology programs on TV. Some seem kind of ridiculous. How reliable is archaeology?

Sometimes when a field of study gets drawn into popular culture, important behind the scenes work gets left out. Worse, sometimes the work is just made more interesting by adding some fictional pieces. Real archaeology done by careful professionals is extremely reliable. Archaeologist's research is carefully studied by their peers to make sure that no one is promoting false information.

Earlier in this chapter, we talked about how several species were found at one site and how it was decided that those species were the ones that still live on today. What we didn't talk about were the months of careful excavation it took to recover the bones—each item has to be documented as it leaves the ground. Or, the months it took to clean the bones and compare them to others. There is also the research that goes into finding other sites in the entire region that have the same, or similar, bones. Over time, this process creates a database of known specimens from across a large area.

Sometimes, there just isn't enough of one animal recovered from a site to specifically say it is a particular species with absolute certainty. When that happens, the analyst studying the bones will have to use family, or even genus name.

Flip back to our friend the pygmy short horned lizard and look at the classification system. If the analyst can identify a lizard to this family or genus, but can't say which specific lizard it is—what terms will they have use to classify the bones?

Answer: Genus: Phrynosoma or Family: Phrynosomatidae

A special thank you to the SCBWI writers group of Moscow, Ariana Burns of Palouse Anthropology, Stacey Camp from Michigan State University, Alyssa Griffith of the Alfred W. Bowers Laboratory of Anthropology, and Jylisa Doney of the University of Idaho Library.

Call to action!

What should you do if you find a sea turtle on the beach? Chances are the turtle is sick or badly hurt. It is best for the turtle if you do not touch or move it. It might sound surprising, but even small touches can hurt a big turtle. Even if the turtle seems to be dead, call one of the numbers below.

Your call might be the thing that saves a sea turtle's life!

**If you see other turtles or other animals that are stranded or in danger — call:
Marine Mammal Stranding Network *immediately* at 1-866-767-6114
or the Oregon State Police tipline at 800-452-7888.**

For more information about sea turtles and stranding visit:

<https://aquarium.org/stranded-sea-turtles>

<https://aquarium.org/education/>

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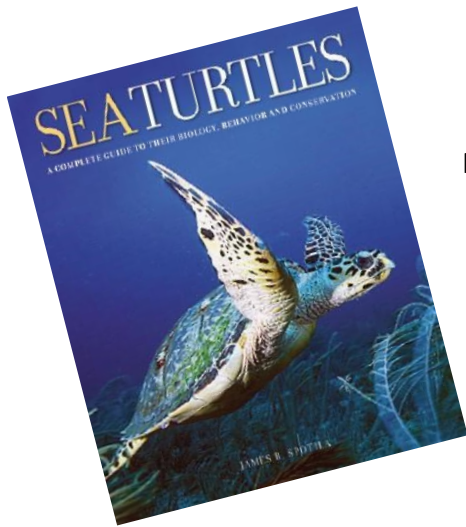
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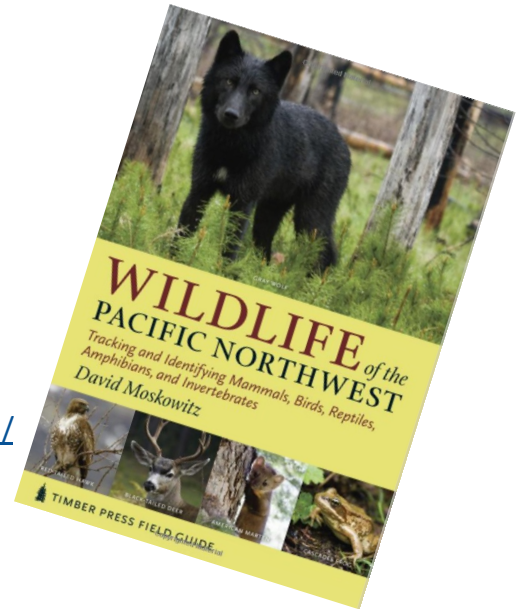
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Try these books!

Full of information about our local plants and animals. These books are suitable for most family members.

Or, you can search the species of British Columbia through this website:

<https://ibis.geog.ubc.ca/biodiversity/efauna/>



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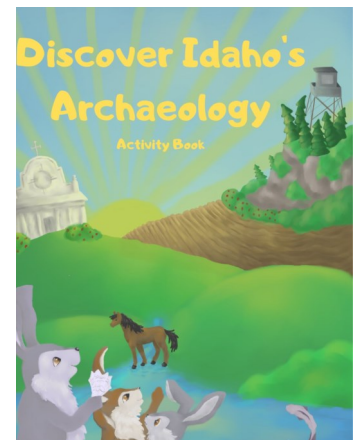
Palouse Wildlife Rescue & Rehabilitation

The Laboratory of Anthropology was founded in 1949 by Alfred W. Bowers to give students the opportunity to practice anthropology and archaeology in a safe environment before entering the professional community.

The laboratory is committed to serving the public through interactive educational programs, interpretive displays, public volunteering programs, lab tours and many other options.

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Palouse Wildlife Rescue & Rehabilitation began in 2006, founded by Idaho resident, Ryan Law. Palouse Wildlife serves animals in the greater Palouse region of north Idaho, in conjunction with veterinary partners at Washington State University and PAWS veterinary clinic.

Like all wildlife rehabilitators, Palouse Wildlife does not receive any state or federal funding—we are purely a result of the volunteered love, time, and gifts given by our kind-hearted community! To learn more about how you can assist local wildlife, click the "Get Involved" link at the top of the page. Thank you for your wonder-

<https://palousewildlife.wixsite.com/palousewildlife>