

New Segments!

WEIRD AND INTERESTING ADAPTATIONS, ICONIC WILDLIFE OF THE 50 STATES, AND FROM THE FIELD



THE DIFFERENCE BETWEEN POISON AND VENOM



**ENDANGERED SPECIES OF THE ISSUE
KAKAPO- THE GROUND DWELLING PARROT**



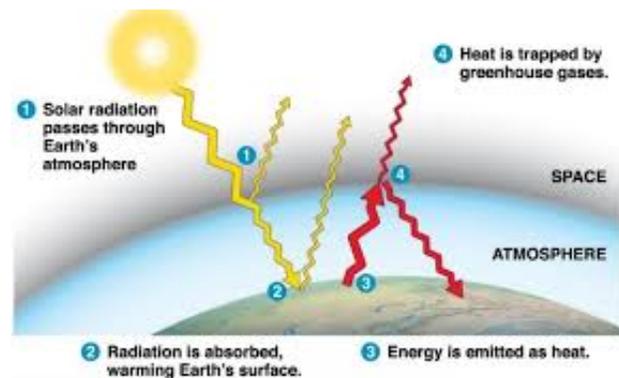
MORE ZOOLOGY KNOWLEDGE WITH THE ADDITION OF PAGE 11!

NEWS FOR THE DEDICATED ZOOLOGIST

Global Climate Change

Often the words *global warming* and *global climate change* are used interchangeably, but these terms do indeed refer to different threats Earth faces.

Global warming focuses specifically on the long- term heating of our planet. The phenomena of global warming has been documented since the pre- industrial time period (1850-1900). During the industrial period, many new innovations were developed. However, such innovations, such as automobiles, factories, and other machinery that led to a burst in human population, were not considered for their environmental impact. Thus, huge quantities of carbon dioxide, methane and other green-house gases were released



into the atmosphere. This marked the time when global warming sky-rocketed (pun intended).

Global Climate Change is the long-term change in Earth's average temperature. To ratify this statement, global climate change not only focuses on the increased temperatures caused by human actions, but also the decreasing temperatures. With human impact on Earth comes jurassic changes in weather patterns, which can include warming and cooling. Generally, scientists use the word *global climate change* when referring to Earth's changing climate because it focuses on global warming *and* global cooling.



As humans continue to burn fossil fuels, raise more livestock (especially cows), etc., more greenhouse gasses are released into Earth's atmosphere. Greenhouse gases, such as carbon dioxide (CO₂), methane (CH₄), Nitrous Oxide (N₂O), and chlorofluorocarbon (CFC), are gases that, when released into the atmosphere, diminish the ozone layer. The ozone layer is what shields Earth from excessive heat and radiation from the sun. This is called the greenhouse effect.

Without the ozone layer and the thickening barrier of greenhouse gases, the sun's heat and ultra-violet (UV) radiation can pass through more easily, and escape with greater difficulty. The greenhouse effect is causing an increase in global temperatures which, without a doubt, causes more evaporation and less rainfall, warming oceans and melting glaciers, diseases such as skin cancers, cataracts, and immune system deficiencies in humans, and unbearable heat in some locations.

The effects of climate change are setting in, and fast! If we do not take action soon, we may face the irreversible damage of climate change and our irresponsible impact on the planet. Luckily, people are taking a stand!

On September 20, 2019, an estimated 4 million people participated worldwide in the Global Climate Strike. Recently, Swedish climate activist, Greta Thunberg (age 16), has become the face of the global climate crisis. In her November 2018 Ted Talk, Thunberg states "Instead of looking for hope, look for action. Then, and only then, hope will come." So hurry up and help end global climate change, because sunscreen and hats won't protect you for much longer.

Iconic Wildlife of the 50 States



California: The California Newt

The California newt (*Taricha torosa*) is an endemic species of California. *Taricha* means "preserved mummy" in Greek. The species name *torosa* means "full of muscle" in Latin.

Like all amphibians, newts must live in wet environments in order to survive. California newt range stretches along the California coast, as well as the coast range mountains of Mendocino county and that of Santa Monica. Their habitat consist of oak forests, chaparral, and grasslands.

Due to habitat loss, invasive species such as crayfish and bullfrogs, and other human imposed threats, California newt population has begun to decline. They are listed as a California species of special concern by the California Department of Fish and Wildlife. At the Santa Monica Mountains National Recreation Area, California newts are a main focus of the Aquatic Amphibian Monitoring Program.

Upcoming Events

Mark these events on your calendar and spread awareness to celebrate them!

- January 5- National Bird Day
- January 10- Save the Eagles Day
- January 16- Dian Fossey’s Birthday
- January 20- Penguin Awareness Day
- January 21- Squirrel Appreciation Day
- January 31- International Zebra Day
- February 1- Serpent Day
- February 2- Hedgehog Day
- February 5- Western Monarch Day
- February 15- National Hippopotamus Day
- February 18- World Whale Day
- February 15- World Pangolin Day
- February 20- 23- Whooping Crane Festival
- February 22- National Wildlife Day
- February 25- March 1- National Invasive Species Awareness Week
- February 27- International Polar Bear Day



Dian Fossey was an American primatologist who dedicated her life to the study and preservation of Rwanda’s mountain gorilla population.



The whooping crane is an endangered species of migratory crane. Their population was hit hard in 1941, with only 15 left in the wild. Now, the whooping crane population is gradually increasing with over 600 individuals living in the wild thanks to conservation efforts.

Your Questions, Answered!

Robby asks: “Why do lizards do push- ups? Are they trying to be macho and impress a mate?”

There are many reasons an animal may present a showy display. Many species of bird will display their bright feathers for courtship. Gazelles will do a display that sends the message of “I know you are watching me and I can escape you if you try to catch me.” to the predator. In the case of lizards and many other species, they are defending territory, known as territorial aggression. Male lizards are the ones that do push- ups and they are boasting to other lizards “This is my territory, keep out.”. Presenting a contender with push- ups allows him to think otherwise about messing with the “macho” lizard.



Nature Poll

Which California national park would you rather visit?



Redwood National Park

OR



Pinnacles National Park

Endangered Species Spotlight

Kakapo

The kakapo (*Strigops habroptila*) is currently a resident of New Zealand's Stewart Islands. They were once found throughout much of North and South America as well, but due to anthropogenic (human caused) threats, the kakapo's range has been severely diminished. This species, posing incredible adaptations, is now labeled as critically endangered on the IUCN Red List as of August 7, 2018.

The kakapo has some pretty amazing adaptations. For starters, they have feathers on the sides of their face that are very sensitive to touch. These specialized feathers act just like a cat's whisker, detecting motion and prey. The kakapo is the only species of parrot incapable of flight. As a result, the kakapo has evolved feather coloring that allow it to camouflage with the vegetation of the forest floor. Despite being able to fly, they can still reach trees. In fact they roost there at night. Walking on the ground constantly requires strong legs, another cool feature of the kakapo. When scaling a tall tree, their powerful legs come into play as well. The kakapo is also nocturnal. So, they have developed a keen sense of smell and touch. In addition to all these amazing adaptations and facts, the kakapo is one of the longest lived birds in the world, with an incredible lifespan of over 90 years!



Kakapo population has been declining as early as the settlement of the Māori people from 1320 to 1350. The settlement of the Europeans in 1642 only brought an even larger decline in kakapo population. Both peoples caused kakapo habitat to diminish. Europeans introduced invasive species such as cats, rats, and stoats. Today, invasive species and habitat loss still greatly affect the kakapo. Invasive species bring disease and are a major threat to kakapo eggs and chicks. Cases of cloacitis (a condition caused by bacteria resulting in the inflammation of the cloaca in birds) and septicemia (blood poisoning also caused by bacteria) have been reported since 2002. Climate change is without a doubt affecting kakapos as well.

In the 1980s, the New Zealand Department of Conservation began efforts to try and save the kakapo population before it was too late. They relocated kakapos to islands of New Zealand that did not have numerous invasive species. Luckily the kakapo population has seen a 72% increase since 2017, with 154 individuals in 2017 and 213 as of September 2019. As we continue to learn more about the kakapo, their incredible adaptations, and their habitat, we can hope that their population increases in years to come.

Some More Fun Facts!

Kakapo means "night parrot" in Māori, the indigenous language of New Zealand.

Adult kakapos weigh between 4 to 9 pounds, making them the heaviest parrot.

Visit <https://www.doc.govt.nz/kakapo-recovery> for more information on kakapo recovery.



Zoology Destinations

Discovering Our Local Species

While Los Angeles seems like a metropolis where minimal species would be able to survive, LA is actually teeming with wildlife. From black bears to common garden snails, and towering Mexican palm trees to California poppies, Los Angeles is full of plants and animals big and small. You just need to know where to look!

Legg Lake, South El Monte

Location: 750 Santa Anita Avenue, South El Monte, CA 91733-4300
 Parking: 741 Santa Anita Parking Lot (free)
 Facility: Picnic tables, shade, and restrooms
 Key Features: Lots of water birds and fishing opportunities

How To Observe Wildlife

Materials

1. Binoculars: Helps you see wildlife at great distances
2. Field guides: Helps you identify the species you find
3. Notebook and pencil or camera: Document your discoveries

There is no *one* way to observe wildlife, but please follow these guidelines

1. Respect wildlife and their habitat
2. Have fun



Legg Lake is one of those hidden oases in Los Angeles. Featuring trees, fish, and a countless number of birds, Legg Lake is an exciting destination. Birds inhabiting Legg Lake include swan geese, grey geese, American coots, great blue herons, and American white pelicans.

Legg Lake is also a popular fishing destination. Trout, catfish, largemouth bass, and bluegill have all been caught here. Fly fishing at Legg Lake is also popular. Looking for some physical activity? Paddle boats are available for rent and there is a trail for biking.

National Park Spotlight

Yosemite National Park



Perhaps Yosemite is most famous for its granite mountains, El Capitan and Half Dome being most well known. But Yosemite is home to much, much more. Yosemite is home to 90 mammal species, including black bears and chickarees (Douglas squirrel), 262 species of birds including the great grey owl and white headed woodpecker, 10 species of amphibian including the Sierra newt, 22 species of reptiles including Sierra mountain king snakes, fish including the California roach, and many insects.

The Differences Between Venom and Poison

We know that animals such as snakes have venom and dart frogs have poison. That monarch butterflies are poisonous and male platypuses are venomous. Is there a difference between being venomous and poisonous? Or are the words used interchangeably? Unfortunately, many people do not recognize the differences between the two methods of delivering toxin. But now, you can!

Venom is a form of toxin that is delivered via a bite or other form of injection. Venomous animals such as rattlesnakes, moles, shrews, and jellyfish all deliver their toxin in this form. Rattlesnakes, moles, and shrews bite, while jellyfish sting. Male platypuses have what is called a spur on their hind feet that injects venom. After the venom is delivered, it can cause bleeding and terrible pain. If no help is sought, the victim can die or become seriously injured. Male platypuses use their spurs during male to male combat, usually seen during mating or territorial disputes.

Poison on the other hand is delivered via secretion or touch. Salamanders, toads, dart frogs, and pitohui (a species of bird) are all examples of poisonous animals. Plants can be poisonous too! Poison ivy, poison oak, water hemlock, deadly nightshade, and oleander are all plants that have poison. Basically, all an animal has to do is touch a poisonous organism, and BOOM!, they have been poisoned. Poison is one of the dart frog family (Dendrobatidae)’s main defenses. It is believed that dart frogs get their poison from the prey they eat, such as ants, termites, and beetles. In fact, if a dart frog is raised in captivity and does not come into contact with these insects, it does not become poisonous. The dart frog mainly uses their poison for defense against predators such as snakes. Just to get an idea of how poisonous a dart frog can be, a single golden poison dart frog has enough toxin to kill 10 adult men, making it not only one of the most poisonous amphibians, but also one of the most poisonous animals in the world!



In conclusion, poison and venom are very different forms of toxin. Venom is injected, while poison is secreted. Both venom and poison act as defense mechanisms as well as aiding in hunting for prey. Venom is used only by animals, while poison can be found in an array of organisms including plants, fungi, and animals. Other organisms are aware of poison and venom, which is why they sometimes mimic poisonous/venomous organisms. All in all, poison and venom are great methods for defense and hunting, and is probably one of nature’s greatest adaptations!

Prehistoric Animal of the Issue: Woolly Mammoth

Relatives of the elephants of today, woolly mammoths (*Mammuthus primigeniu*) were key features of the last ice age during the Quaternary time period 2.58- 0.012 million years ago. Though they are an extinct species, woolly mammoth history and biology lives on in the form of fossils and cave paintings.

The woolly mammoth lived in parts of North America and Eurasia some 300,000 years ago. They had thick fur and numerous layers of fat that insulated them from the cold temperatures of the Quaternary ice age. With long, pointed tusks, the mammoth was well protected from any predator that wanted to take it on. Even our early ancestors, the Neanderthals faced huge consequences if a hunt was not successful.



Recent genetic testing has concluded that the woolly mammoth's closest living relative is the Asian elephant. However, the woolly mammoth is obviously adapted for cold temperatures that were experienced during the last ice age. In fact, that is exactly how the woolly mammoth, and most ice age animals went extinct. As the planet began to warm again, rainfall was more common and created dense forests. This invaded woolly mammoth habitat, tundras. Tundras provided mammoths with their main source of food, grass. With less grass available, mammoths moved elsewhere, and eventually went extinct around 3,700 years ago. A combination

of that, ancient human hunters, and possibly a comet that struck Southern Canada led the woolly mammoth to extinction.

Ice Ages

An ice age is a long period of time (millions to tens of millions of years) in which Earth's global temperature drops below usual temperatures. There are also large areas covered in glaciers and ice sheets. Ice ages can also include short periods of time in which temperature rises slightly and then drops again. This is called an interglacial or interglacial cycle.

During Earth's long history, there have been at least five major ice ages. The first was over 2 billion years ago (Huronian Ice Age). The latest is the Quaternary Ice Age, lasting from 2.75 million years ago to now. This was the ice age that affected the mammoths. There was also an ice age that lasted from 850 to 630 million years ago (Cryogenian), an ice age from 460 to 420 million years ago (Andean-Saharan), and one from 360 to 260 million years ago called the Karoo Ice Age.



Ice ages can hugely effect the organisms living during that time. Mammoths, for example, had to grow long coats of fur at the start of the ice age and had a hard time adapting to warming temperatures afterwards. Ice ages can cause organisms to flourish- like the mammoth- and others to perish. Speaking of which, as the planet begins to warm, organisms will for sure perish and others may flourish. It greatly depends on the organism's adaptability to changing temperatures.

Want to experience the massiveness and awesomeness of the woolly mammoth and other ice age animals in person? Visit La Brea Tar Pits located in Los Angeles!

Games

Los Angeles Wildlife Bingo

 Great Blue Heron	 Red-eared Slider	 Common Garden Snail	 Bobcat
 California Newt	 Coyote	 Marine Blue Butterfly	 American Crow
 Western Honey Bee	 California Towhee	 Mule Deer	 Roly-poly
 California Ground Squirrel	 Convergent Ladybug	 American Bullfrog	 Western Fence Lizard

Zoology Term of the Issue

Cellular Respiration, noun

Ever wonder why you and other organisms need to breath? The answer: energy! Cellular respiration is the process of using inhaled oxygen to process a sugar called glucose for fueling cells. Via the blood stream, oxygen and glucose enter cells, specifically an organelle called the mitochondria. It is here that ATP, along with water and carbon dioxide are produced. This is known as respiration. ATP is energy that will go on to fuel the cell. This is why the mitochondria is known as the *power house of the cell*. Carbon dioxide is the waste gas. It enters the blood stream and is carried out to the lungs, where it is exhaled.

Name the Animal!



This animal is named after its main source of food.

This bird could be affected by climate change because of the habitat it lives in.

This animal is listed as *least concern* on the IUCN Red List with an increasing population for now.

This bird lives in the oak woods, mixed forests, oak-pine canyons, and foothills of the western United States.

This bird is social, usually living in small groups of 10 to 16.

Members of the group take care of the eggs and young of others.

This animal is an avid hole driller, a single tree may have up to 50,000 holes in it after a few generations.

In addition to their main source of food, this animal will also feed on sap.

Still stumped?
Find the answer on page 12!

Invertebrates Of The Issue:

Classification: *Porifera* and *Cnidaria*

There are fish, amphibians, reptiles, birds, and mammals in the vertebrate phylum *Chordata*, but what phyla are part of the invertebrates? There are eight major phyla of invertebrates. These include sponges (phylum *Porifera*), the cnidarians (phylum *Cnidaria*), the flatworms (phylum *Platyhelminthes*), the roundworms (phylum *Nematoda*), the echinoderms (phylum *Echinodermata*), the mollusks (phylum *Mollusca*), annelids (phylum *Annelida*), and arthropods (phylum *Arthropoda*).

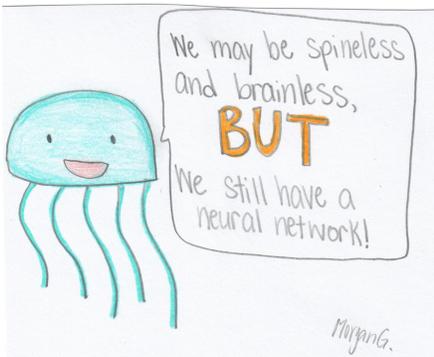


There are an estimated 3,000 different species in the phylum *Porifera*. The name *Porifera* originates from the Latin words *porus* and *ferre*, which together means “to bear pores”, as seen in sponges. Sponges are considered to be the most primitive animal. Their biology cannot get much simpler. They completely lack advanced organs, and therefore organ systems. A sponge’s body is simply made up of tissue that is 2 cells thick. During feeding, sponges will allow passing organisms to enter their body. Then their prey will be processed in the central cavity, where it is digested and then expelled through pores on the opposite end.

There are an estimated 9,200 species in the phylum *Cnidaria*. The phylum *Cnidaria* has Greek origins. The word *knide* means “nettle” or “stinging”, referring to the nematocysts, or stinging cells, that many cnidarians possess. Jellyfish, coral polyps, anemones, and hydras are some examples of cnidarians. All cnidarians can be described by their radial symmetry and jelly-like body. They also live exclusively in marine environments. Cnidarians use their nematocysts for protection as well as for hunting. A passing organism, whether that’s a big fish or a microscopic plankton, can get stung by the venom. After that, the cnidarian will bring its prey closer to its mantle and digest it there. Fascinating right?



Whether it’s a sponge or a jellyfish, a nematode or a beetle, invertebrates are really really cool creatures with awesome ways to survive- despite lacking a backbone.



Weird & Interesting Adaptations

Name: Platypus (*Ornithorhynchus anatinus*)

Weirdest Feature: Duck-like bill

Purpose: During hunting, platypuses swim with their eyes closed. Instead of relying on sight, they use their sense of touch and echolocation, which is achieved by their bill. The bill actually has pores that emit electroreceptors, which allow the platypus to find its food.





From The Field: Inside Passage, Alaska and Canada



Inside Passage, AK and CA field notes

June 29, 2019

9:20 am

Queen Charlotte Strait,
Canada

- A pair of resident orcas (*Orcinus orca*) spotted off port side of ferry headed north.
- Male pictured in front with younger female behind him. Could share family bond.
- Awesome experience!

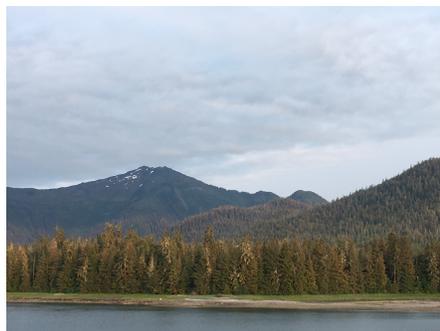
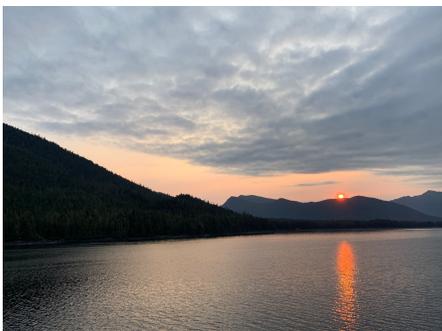
June 30, 2019

5:19 pm

Ketchikan, AK

- Bald eagle (*Haliaeetus leucocephalus*) spotted atop lifting crane

This entry is sourced from my trip to Alaska during the summer of 2019.



Resources

- <https://defenders.org/wildlife/florida-manatee>
- <https://www.livescience.com/32192-why-do-lizards-do-push-ups.html>
- <http://www.californiaherps.com/salamanders/pages/t.torosa.html>
- <https://www.nps.gov>
- <https://www.allaboutbirds.org/news/whooping-crane-population-hits-historic-high-in-2018/>
- <https://www.iucnredlist.org/species/22685245/129751169#use-trade>
- <https://www.wired.com/2014/03/creature-feature-10-fun-facts-kakapo/>
- <https://www.nps.gov/yose/learn/nature/animals.htm>
- birdandmoon.com
- <https://www.nationalgeographic.com/animals/amphibians/group/poison-dart-frogs/>
- https://www.ancient.eu/Woolly_Mammoth/
- <https://www.smithsonianmag.com/videos/category/science/what-really-killed-off-the-woolly-mammoth/>
- <http://www.ces.fau.edu/nasa/module-3/temperature-trend-changes/past-climates.php>
- <https://geology.utah.gov/map-pub/survey-notes/glad-you-asked/ice-ages-what-are-they-and-what-causes-them/>
- “Wild LA: Explore the Amazing Nature in and Around Los Angeles” By: Lila Higgins, Dr. Gregory B. Pauly, Dr. Jason G. Goldman, and Charles Hood
- <https://www.audubon.org/field-guide/bird/acorn-woodpecker>
- <https://www.brainpop.com/science/cellularlifeandgenetics/cellularrespiration/>
- <https://owlcation.com/stem/10-Most-Common-Invertebrate-Animals>
- https://www.reed.edu/biology/professors/srenn/pages/teaching/web_2007/myp_site/

Thank You for reading this month’s edition of “News for the Dedicated Zoologist”! I hope you enjoyed it.



Hang on, there's more!

If you would like to ask a **zoology related** question to be featured in "Your Questions, Answered", what you need to do is simple!

"News For the Dedicated Zoologist" Request Information

Name: _____

Question: _____

Email (also optional): _____

Please give this piece of paper to Morgan Gaskell **or** send the information to biologyislife@50-50.com.

Answers- Name the Animal!

The animal on page 8 is an acorn woodpecker (*Melanerpes formicivorus*).



NEWS FOR THE DEDICATED ZOOLOGIST

"Those who dwell among the beauties and mysteries of the Earth are never alone or weary of life."

-Rachel Carson
Marine biologist and conservationist

We Want You
To Ask Us Questions For
"Your Questions,
Answered".



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