

Species Then and Now Data



Field Guide: Canids (The Dog Family)

	Pleistocene/Holocene		Today	
	Size	Diet	Size	Diet
Dire Wolf	130–175 pounds	Camels, horses, bison, tapirs, glyptodonts	n/a	n/a
Gray Wolf	50–150 pounds	Camels, horses, bison, Dall's sheep, caribou, musk oxen	50–150 pounds	Deer, elk, bison, moose but will also eat beaver and rodents
Coyote	39–46 pounds	Juvenile horses, llamas, camels, and possibly bison	15–46 pounds	Rodents, deer, juvenile elk, pronghorn, carrion, beaver, fruit, grass, and insects

Coyotes during the late Pleistocene had thicker skulls and wider snouts than the coyotes of today and may have hunted in packs. Their teeth were structured for shearing but their grinding teeth were small. Teeth and jaws of today's coyotes still allow for shearing but the jaw is longer to make room for more grinding teeth.

Gray wolves and coyotes, as well as other wolf-like species, crossed from Asia over the Bering land bridge into North America nearly 5 million years ago. Dire wolves had shorter legs, heavier jaws, and larger shoulder blades and pelvic bones than gray wolves suggesting they relied on power instead of speed. Both species had powerful jaws and teeth that could crush the bones of large prey animals. They both may also have scavenged carrion (dead animals) from smilodon (sabre-tooth cats) or cave lion kills.

Key times in history

- Wolf-like canids crossed the Bering land bridge and populations began to grow in North America; their population was estimated to be over 2 million.
- Dire wolves died out completely by 11,700 years ago.
- Wolves were eliminated in most of the United States; in Yellowstone National Park the last wolf was killed in 1926.
- In 1973, gray wolves were protected under the Endangered Species Act.

- As of 2013, population of gray wolves is now at over 5,000 in 8 states in the United States.¹
 - At least 2,211 wolves live in Minnesota, 658 in Michigan, 809 in Wisconsin, 625 in Montana, 683 in Idaho, 277 in Wyoming, 46 in Oregon, and 53 in Washington State.¹
- Because of their lifestyle it's hard to see many coyotes, but estimates of coyote population sizes in 6 states and into Canada (MN, IA, MI, ND, SD, WI, Ontario) based on captures and kills today are well over 300,000. In the same region in 1970, the number was closer to 45,000.²
 - Coyotes' range has exploded from central North America to greater Canada and Alaska as well as southerly into Central America. Coyotes have been spotted in every US state except Hawai'i.³
- The decline of gray wolves, a main competitor to coyotes, led to the further expansion of coyotes in the 1940s and 1950s, with coyotes weighing 4–6 kg heavier than previous populations, often due to wolves cross-breeding with coyotes due to wolves not having enough mates.⁴



¹ U.S. Fish and Wildlife Service Endangered Species. "Wolf Recovery in North America." September 2013. Fws.gov. <https://www.fws.gov/midwest/wolf/history/pdf/WolfRecoveryFactSheetNA2013.pdf>.

² University of Minnesota Duluth. "Minnesota Mammals: Coyote (*Canis latrans*)." 2021. <https://mnmammals.d.umn.edu/coyote>.

³ Dell'Amore, Christine. "Coyotes Have Expanded Their Range to 49 States—And Show No Signs of Stopping." *National Geographic*. November 29, 2019. <https://www.nationalgeographic.com/animals/article/coyotes-expansion-north-america-wildlife-nation>.

⁴ Levy, Sharon. "Rise of the Coyote: The New Top Dog." *Nature* 485 (2012): 296–297. <https://doi.org/10.1038/485296a>.

Range maps



Dire Wolf Range 15,000 years ago



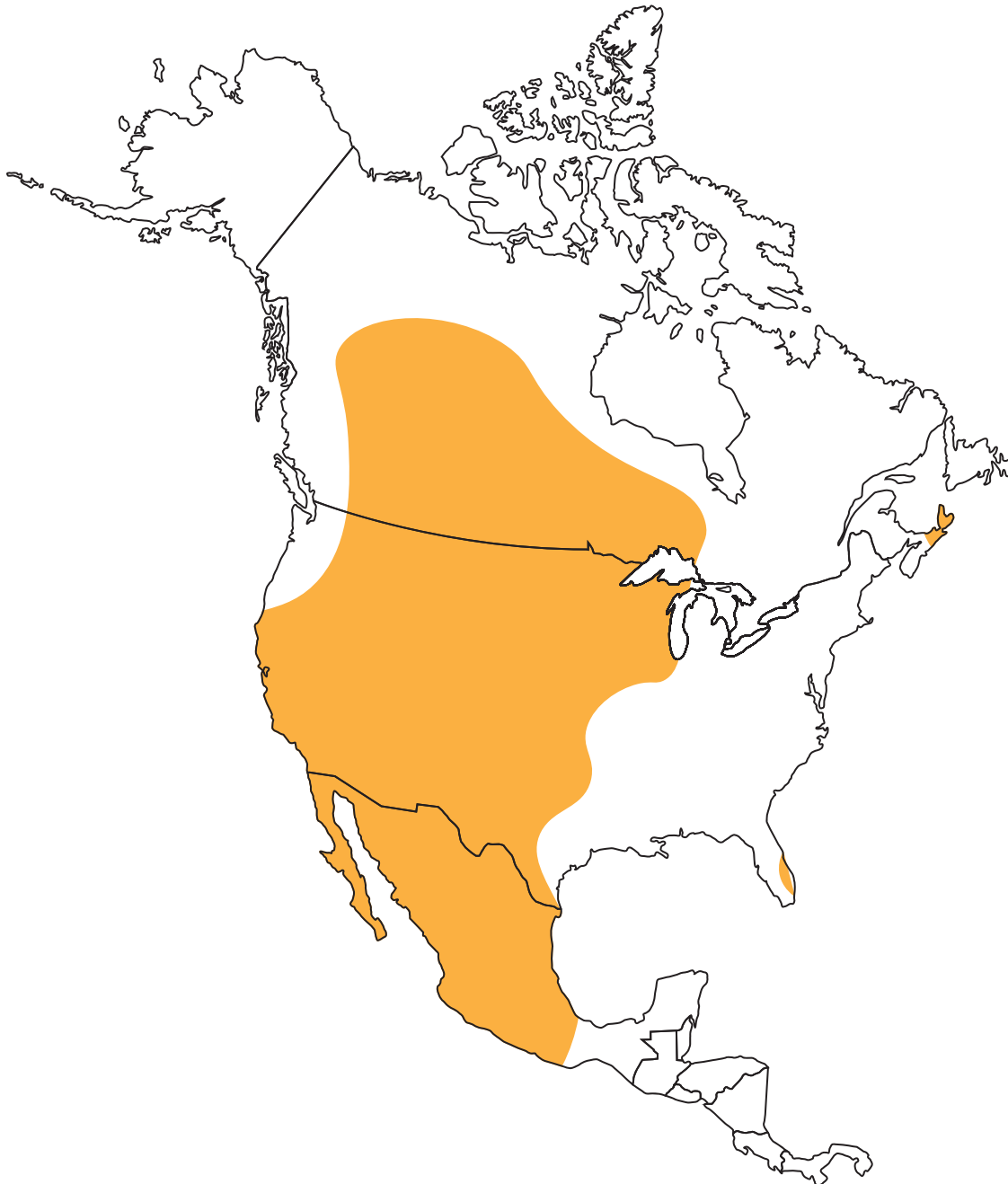


Gray Wolf Range 15,000 years ago





Coyote Range 15,000 years ago



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Dire Wolf Range Today





Gray wolf range today





Coyote Range Today



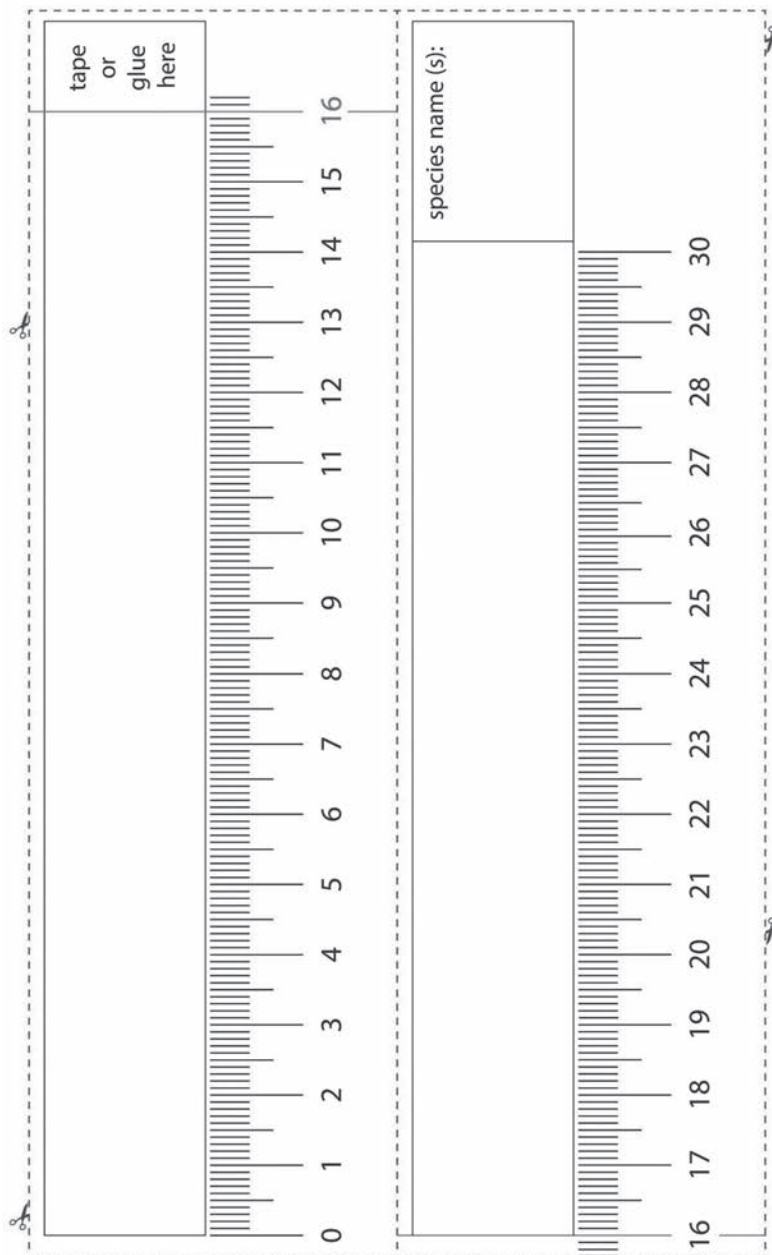
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Scale Model of Then and Now Timeline

To create the scaled timeline:

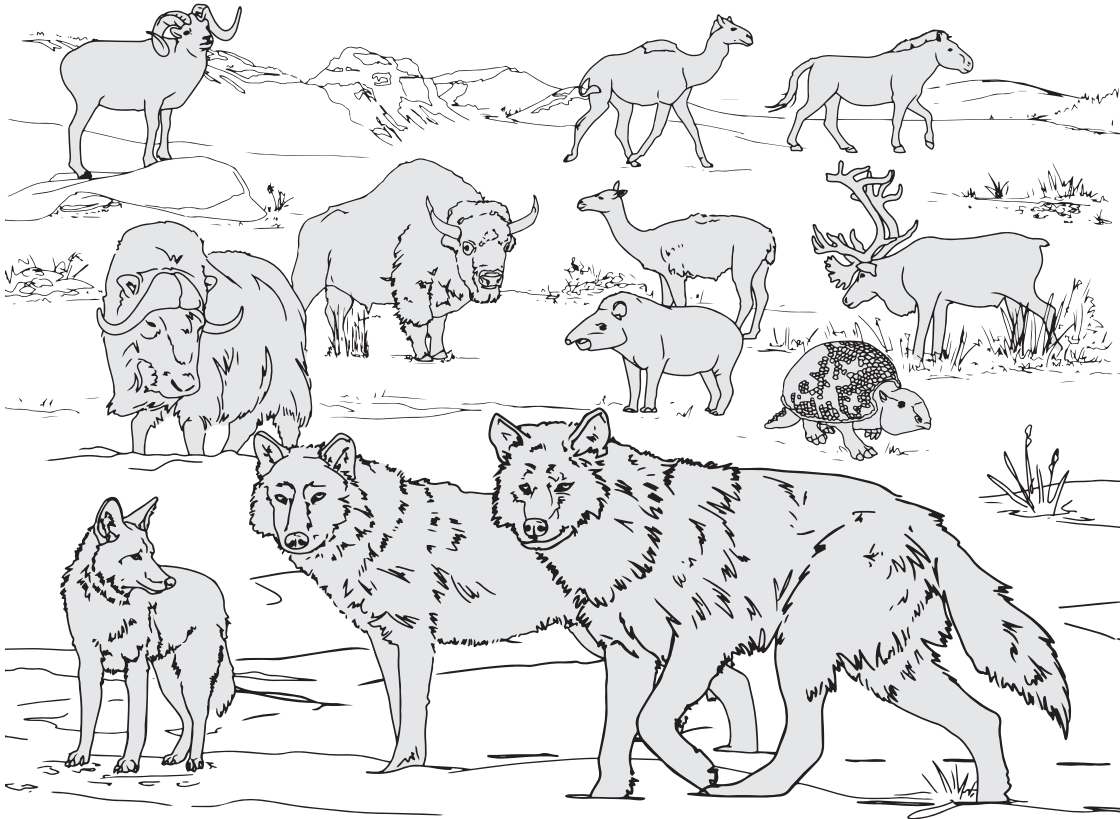
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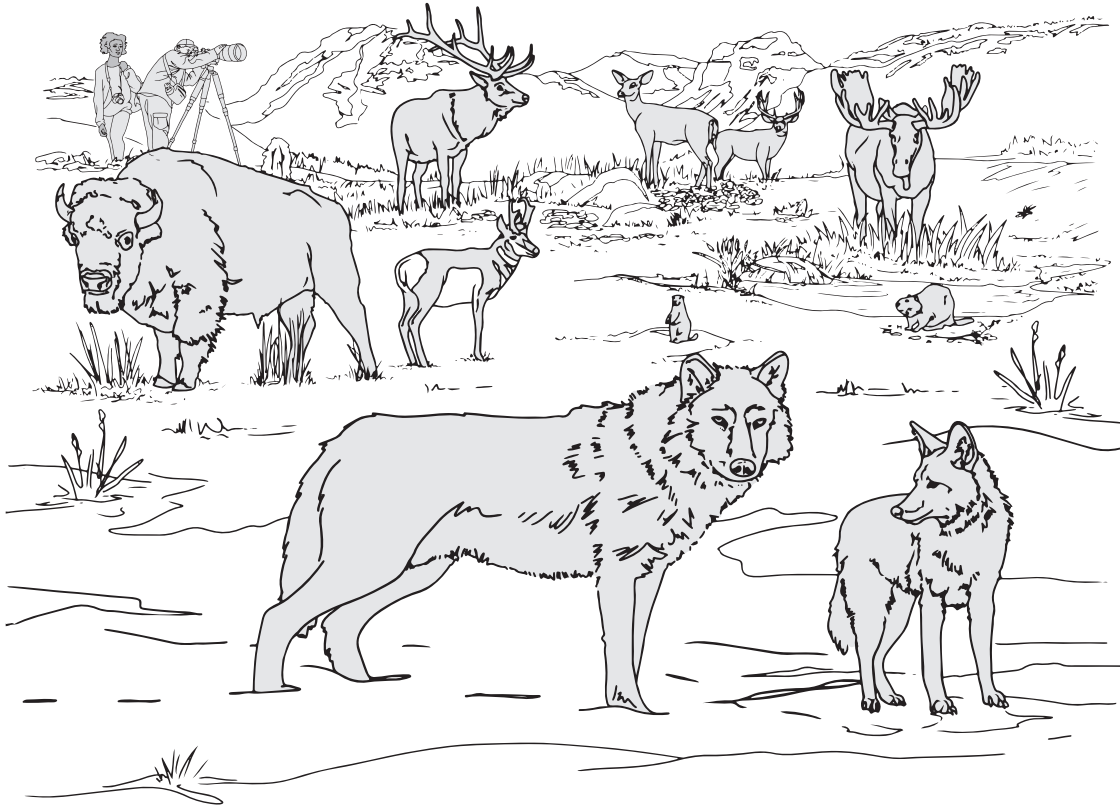
Ecosystem snapshot for canids



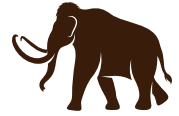
Then:



Now:



Field Guide: Mammoths



	Pleistocene/Holocene		Today	
	Size	Diet	Size	Diet
Woolly Mammoth	10,000 to 12,000 pounds Up to 13-foot tusks	Forbs (not a grass or woody plant), grasses	n/a	n/a
Columbian Mammoth	18,000 to 22,000 pounds Up to 16-foot tusks	Grasses, sedges, some trees and woody plants	n/a	n/a

Columbian mammoths had less hair and lived further from the ice sheets and tundra. They had ridged molars (teeth) for chewing plants. These teeth grow in sets, with more sets of teeth growing in as the mammoth got older. By examining fossil teeth, scientists have estimated the Columbian mammoth could live up to 70 or 80 years.

Mammoths are monogastric, meaning they have one stomach chamber. The cellulose in their diet of grasses and forbs was fermented in their upper digestive tract and broken down by specialized bacteria. Lyuba, the baby mammoth found preserved in the Siberian permafrost in 2007, had adult feces in her stomach, suggesting mammoth babies ate their mother's dung in order to give their digestive system the correct bacteria.

Both species of mammoths were preyed upon by smilodons (sabre-tooth cats), cave lions, cave hyenas, and dire wolves.

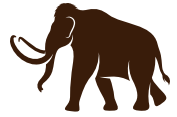
Key times in history

- Mastodons or mammoths crossed the Bering land bridge and populations began to grow in North America; their population was estimated to be around 13,000.⁵
- Most mammoths died out by 11,700 years ago due to climate change melting icebergs and destroying their vegetation. The only surviving mammoth was a population of dwarf mammoths that lived on Wrangel Island in Alaska and went extinct about 4,000 years ago after running out of fresh water.⁵
- In 1930, as many as 10 million wild elephants roamed huge swaths of the African continent; however, today there are just 415,000 elephants across Africa.⁶

⁵ Palkopoulou, Eleftheria, Swapan Mallick, Pontus Skoglund, Jacob Enk, Nadin Rohland, Heng Li . . . Love Dalén. "Complete Genomes Reveal Signatures of Demographic and Genetic Declines in the Woolly Mammoth." *Current Biology* 25, no. 10 (2015): 1395–1400. doi:10.1016/j.cub.2015.04.007.

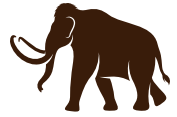
⁶ World Wildlife Fund. "The Status of African Elephants." 2018. <https://www.worldwildlife.org/magazine/issues/winter-2018/articles/the-status-of-african-elephants>.

Range maps



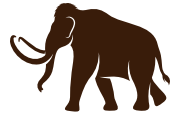
Woolly Mammoth Range 15,000 Years Ago





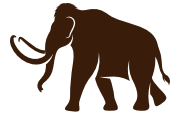
Columbian Mammoth Range 15,000 Years Ago





Woolly Mammoth Range Today





Columbian Mammoth Range Today





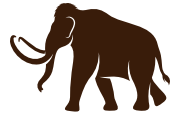
Scale Model of Then and Now Timeline

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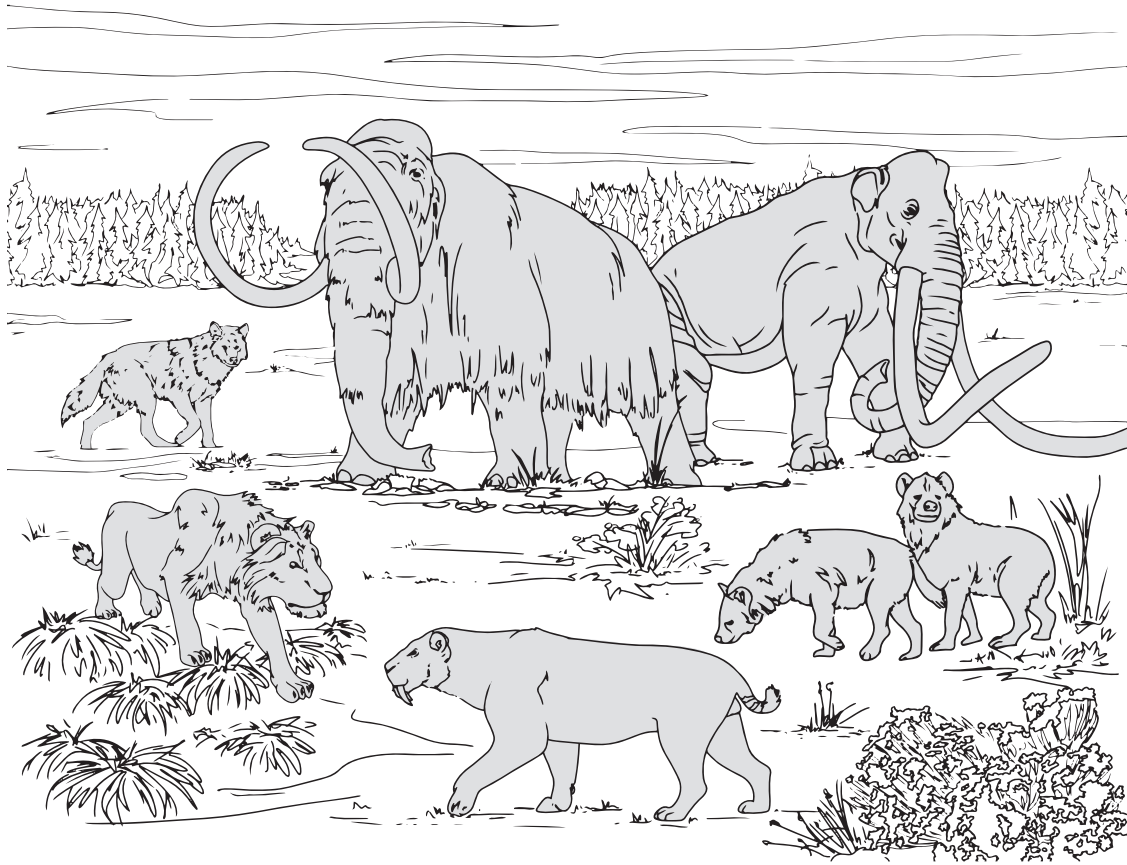
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tape or glue here	species name (s):
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Ecosystem snapshot for mammoths



Then:



Now:



Field Guide: Condors/vultures



	Pleistocene/Holocene		Today	
	Size	Diet	Size	Diet
California Condor <i>Gymnogyps californianus</i>	Wingspan of 9.5 feet Weight 25 pounds	Scavenger of giant sloth, camels, bison and other animals killed by large carnivores but shifted to marine organisms washing up on beaches when large carnivores became extinct	Wingspan of 9.5 feet Weight 25 pounds	Scavenger
<i>Teratornis merriami</i>	Approximated to be 11.5–12.5 feet Weight 30 pounds	Scavenger of giant sloth, camels, bison and other animals killed by large carnivores, but could have also been an active predator hunting smaller prey like fish and amphibians	n/a	n/a

California condors can use their enormous wingspan to glide up 15,000 feet in the air to survey the ground for carrion (dead animals).

Teratornis merriami had stout legs and claws that were able to hold prey down while its thick beak could tear into flesh, but it relied heavily on carcasses of large animals like mammoths, sloths, camels, and bison killed by predators like wolves, bears, and saber-tooth cats.

Key times in history

- The California condor (*Gymnogyps californianus*) is a large vulture, a bird of prey, and has the longest wingspan of any bird in North America, almost 10 feet long.
- Their populations began to grow in North America and during the last ice age their population was estimated to be around 10,000 individuals, with populations being close to 50,000 around 1 million years ago, during the early Pleistocene Epoch.⁷
- Due to many of the large animal prey of condors going extinct during the last ice age, the *Teratornis merriami*, a giant vulture with a wingspan of 11-12 feet, became extinct around 11,700 years ago.

⁷ Robinson, Jacqueline A., Rauri C. K. Bowie, Olga Dudchenko, Erez L. Aiden, Sher L. Hendrickson, Cynthia C. Steiner . . . Jeffrey D. Wall. "Genome-Wide Diversity in the California Condor Tracks Its Prehistoric Abundance and Decline." *Current Biology* 31, no. 13 (2021): 2939–2946.e5. <https://doi.org/10.1016/j.cub.2021.04.035>.



- A popular theory is that the California condor's ancestors were able to survive on the west coast of North America because they switched from larger prey to seafood.⁸
- California condor numbers plummeted by the 1970s after two decades of lead poisoning (from lead bullets left in prey), DDT use, overpoaching, and habitat loss.⁹
- Because of the lead poisoning affecting many California condors that eat dead land organisms, it is thought that condors eating primarily seafood again may help their species since marine animals are not shot and killed with lead bullets.¹⁰
- As of 2019, California condor numbers are now at 518 in 3 states (CA, UT, NV).¹¹

⁸ Fox-Dobbs, Kena, Thomas A. Stidham, Gabriel J. Bowen, Steven D. Emslie, and Paul L. Koch. "Dietary Controls on Extinction Versus Survival Among Avian Megafauna in the Late Pleistocene." *Geology* 34, no. 8 (2006): 685–688. <https://doi.org/10.1130/g22571.1>.

⁹ Kiff, Lloyd F. "The Current Status of North American Vultures." In *Raptors at Risk*, edited by R. D. Chancellor and Bernd-Ulrich Meyburg. British Columbia: Hancock House Publishers, 2000. http://www.globalraptors.org/grin/researchers/uploads/118/status_of_vultures.pdf.

¹⁰ Bittel, Jason. "The Food That Once Saved Condors May Now Be Poisoning Them." Natural Resources Defense Council. August 19, 2016. <https://www.nrdc.org/onearth/food-once-saved-condors-may-now-be-poisoning-them>.

¹¹ U.S. Fish and Wildlife Service. "California Condor Recovery Program." 2021. https://www.fws.gov/cno/es/CalCondor/PDF_files/2020/2019_California_Condor_Population_Status.pdf.

Range maps



California condor range 15,000 years ago





***Teratornis merriami* range 15,000 years ago**





California condor range today





***Teratornis merriami* range today**





Scale Model of Then and Now Timeline

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The form is a template for a scale model of a timeline. It consists of two vertical strips, each 30 cm long, with a central gap. The left strip has a ruler scale from 0 to 16 cm. The right strip has a ruler scale from 16 to 30 cm. The top of the left strip is labeled "tape or glue here". The top of the right strip is labeled "species name (s):". Dashed lines indicate where to cut out the strips.

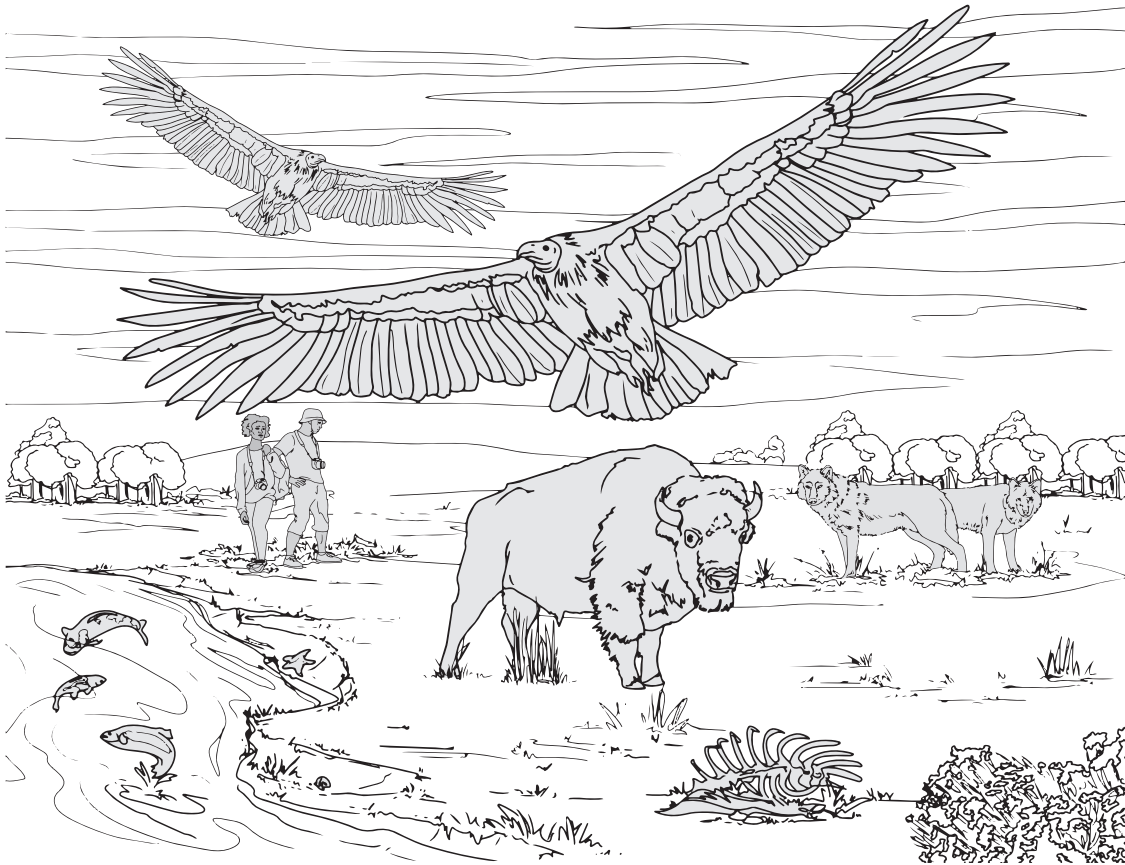
Ecosystem snapshot for vultures/condors



Then:



Now:



Field Guide: Diamondback Terrapins



	Pleistocene/Holocene		Today	
	Size	Diet	Size	Diet
Diamond-back terrapin (turtle)	Males about 5 inches in length Females can reach 9 inches in length	Fish, crabs, periwinkle snails, mollusks, roots and shoots of saltmarsh plants	Males about 5 inches in length Females can reach 9 inches in length	Fish, crabs, mollusks, roots and shoots of saltmarsh plants

Diamondback terrapins were a source of food for a growing human population. This resulted in overharvesting in the early 1900s as people found turtle soup a delicacy. Because of other factors like beach development, recreation, and habitat loss, the population numbers have not fully recovered.

Currently this species is protected by law in some states. Even the beach grass in locations where terrapins lay their eggs is protected because of its ability to lower the temperature of nesting areas. High temperatures can affect the sex of offspring but fluctuations between temperatures produce a mix of males and females.

Key times in history

- The common ancestor for all turtles, terrapins, and tortoises in North America evolved during the Jurassic period almost 200 million years ago when North America was very close to the large land mass, Gondwana (eventually separating and becoming Africa, Australia, and South America).¹²
- At the peak of their harvesting, 400,000 pounds of diamondback terrapins were captured each year; their populations were reduced so low the fishing industry stopped collecting diamondback terrapins in the late 1800s and early 1900s due to the overharvesting for the restaurant industry.¹³
- Populations slowly began to grow in North America as harvesting decreased and some states are starting to outlaw their capture. While there are no comprehensive studies along the entire East Coast, their population from several studies throughout the 2000s estimated there are over 3,000 individuals.¹⁴
- Because their populations are hard to estimate owing to their widespread overharvesting and the genetic mixing of populations due to their transport across the world, best estimates are based on their capture rates, putting their numbers before widespread capture probably close to the millions.

¹² Pérez-García, Adan. "A New Turtle Confirms The Presence of Bothremydidae (Pleurodira) in the Cenozoic of Europe and Expands the Biostratigraphic Range of Foxemydina." *The Science of Nature* 103, no. 7–8, (2016): 50. doi:10.1007/s00114-016-1375-y.

¹³ Hart, Kristen M., and David S. Lee. "The Diamondback Terrapin: The Biology, Ecology, Cultural History, and Conservation Status of an Obligate Estuarine Turtle." *Studies in Avian Biology* 32 (2006): 206–213. https://sora.unm.edu/sites/default/files/SAB_032_2006%20P206-213_The%20Diamondback%20Terrapin%20-%20The%20Biology%2C%20Ecology%2

¹⁴ Petre, Charlotte, Will Selman, Brian R. Kreiser, Steven H. Pearson, and John J. Wiebe. "Population Genetics of the Diamondback Terrapin, *Malaclemys terrapin*, in Louisiana." *Conservation Genetics* 16, no. 5 (2015): 1243–1252. <https://doi.org/10.1007/s10592-015-0735-z>.

- By the 1930s, the diamondback terrapin was almost extinct and then prohibition prevented restaurants from finding the alcohol that the turtle meat was prepared in and prevented them from being widely available in restaurants moving forward. However, as populations begin to slowly increase, the market for turtle meat is beginning to expand again.¹⁵
- While current terrapin numbers are unknown and they are still considered a vulnerable species, we know they are increasing and can be found all across the east coast of the United States, in 16 states (AL, CT, DE, FL, GA, LA, MD, MA, MS, NJ, NY, NC, RI, SC, TX, and VA).¹⁶



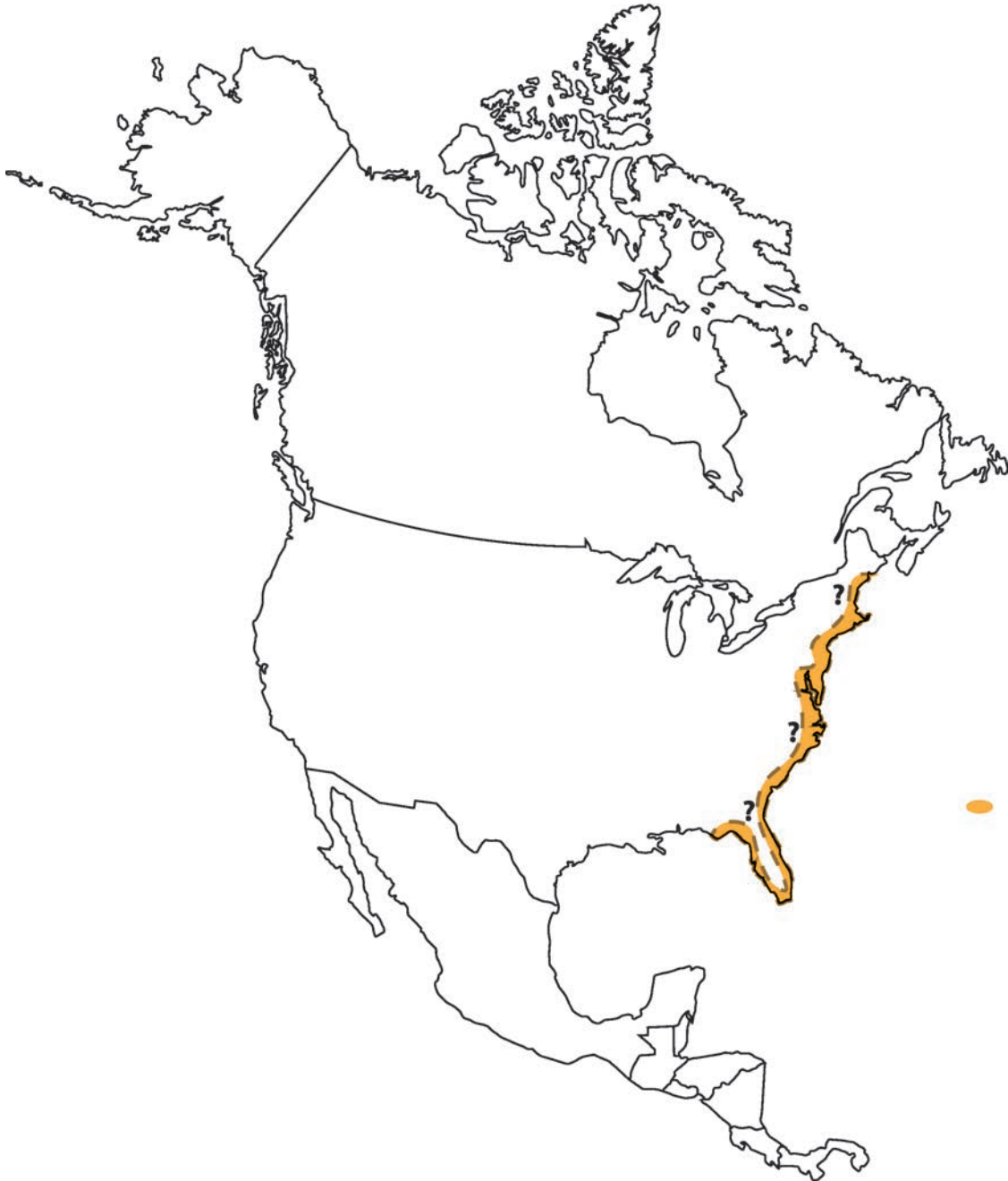
¹⁵ Petre, Charlotte, Will Selman, Brian R. Kreiser, Steven H. Pearson, and John J. Wiebe. "Population Genetics of the Diamondback Terrapin, *Malaclemys terrapin*, in Louisiana." *Conservation Genetics* 16, no. 5 (2015): 1243–1252. <https://doi.org/10.1007/s10592-015-0735-z>.

¹⁶ U.S. Fish and Wildlife Service. "Diamondback Terrapin." March 2013. [fws.gov.https://www.fws.gov/international/cites/cop16/diamondback-terrapin.html](https://www.fws.gov/international/cites/cop16/diamondback-terrapin.html).

Range Maps



Diamondback terrapin range 15,000 years ago





Diamondback terrapin range today



Scale Model of Then and Now Timeline

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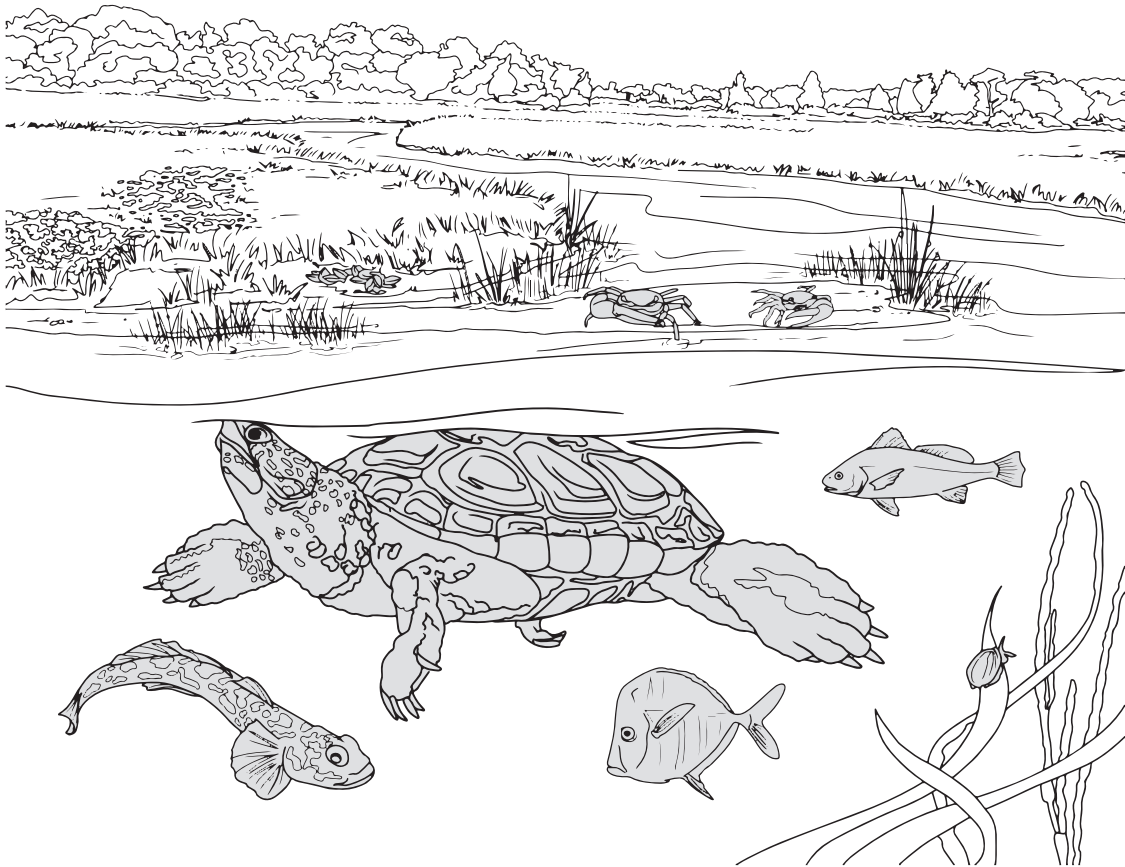
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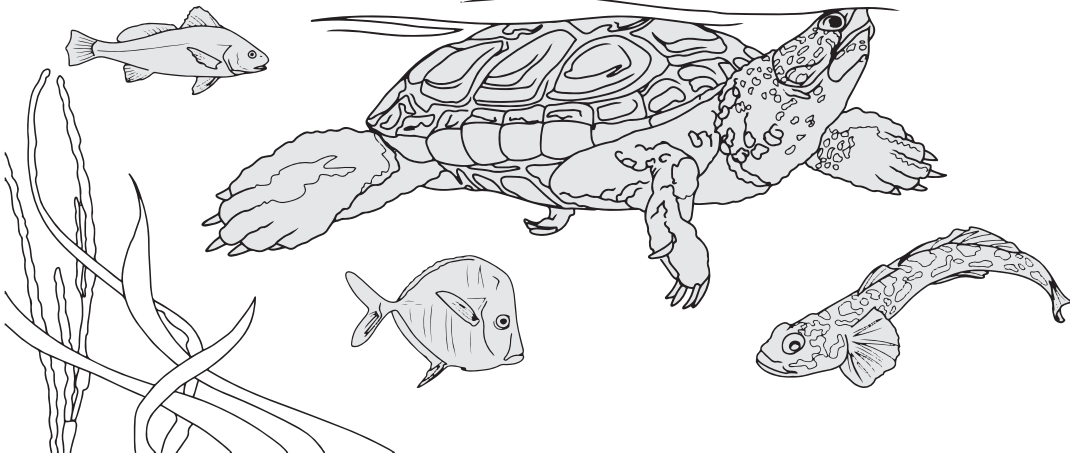
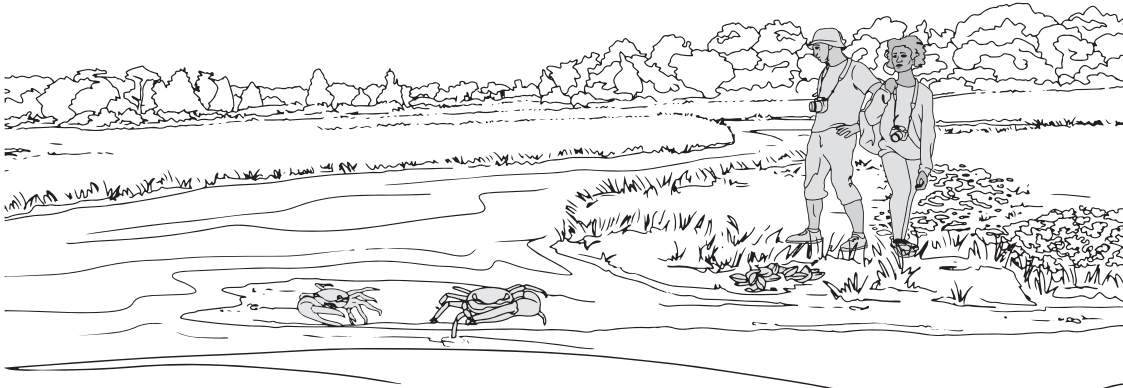
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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Ecosystem snapshot for diamondback terrapins

Then:



Now:



Field Guide: Bison



	Pleistocene/Holocene		Today	
	Size	Diet	Size	Diet
<i>Bison bison</i> (buffalo)	660–2,000 pounds	Grasses, shrubs, and forbs	800–2,200 pounds	Grasses, shrubs, and forbs
<i>Bison occidentalis</i>	880–2,400 pounds	Grasses, shrubs, and forbs	n/a	n/a

Bison (North American buffalo) are large but quite fast and agile. They can reach speeds of 35 mph while running, turn quickly, and can jump 5-foot fences easily. The shoulder hump is formed by long vertebrae supporting groups of powerful muscles. These support the massive head swinging back and forth while a bison pushes through deep snow to find food to survive harsh winters.

Key times in history¹⁷

- Ancestors of today's bison crossed the Bering land bridge and populations at two distinct times around 135,000-195,000 years ago and then again around 21,000-45,000 years ago. They began to grow in North America and at 15,000 years ago their population was estimated to be around 30 million to 75 million individual bison.¹⁸
- Bison were nearly eliminated in most of the United States by 1883. A herd of about 500 animals survived in Yellowstone National Park.
- In 1894, Congress made bison hunting illegal in Yellowstone, which now has a bison population of 5,450.
- Today, about 30,000 bison are living under conservation status in natural areas and ranches in 10 states (AK, CO, KS, MT, NE, ND, OK, SD, UT, and WY).
- Another 300,000 are raised as livestock.¹⁹

¹⁷ U.S. Fish and Wildlife Service. "American Buffalo (*Bison bison*)." 1998. https://www.fws.gov/species/species_accounts/bio_buff.html.

¹⁸ Froese, Duane, Mathias Stiller, Peter D. Heintzman, Alberto V. Reyes, Grant D. Zazula, André E. R. Soares . . . Beth Shapiro. "Fossil and Genomic Evidence Constrains the Timing of Bison Arrival in North America." *Proceedings of the National Academy of Sciences of the United States of America* 114, no. 13 (2017): 3457–3462. doi:10.1073/pnas.1620754114.

¹⁹ U.S. National Park Service. "Frequently Asked Questions: Bison." <https://www.nps.gov/yell/learn/nature/bisonfaq.htm>.

Range Maps



***Bison bison* (buffalo) range 15,000 years ago**





***Bison occidentalis* range 15,000 years ago**





***Bison bison* (buffalo) range today**





***Bison occidentalis* range today**

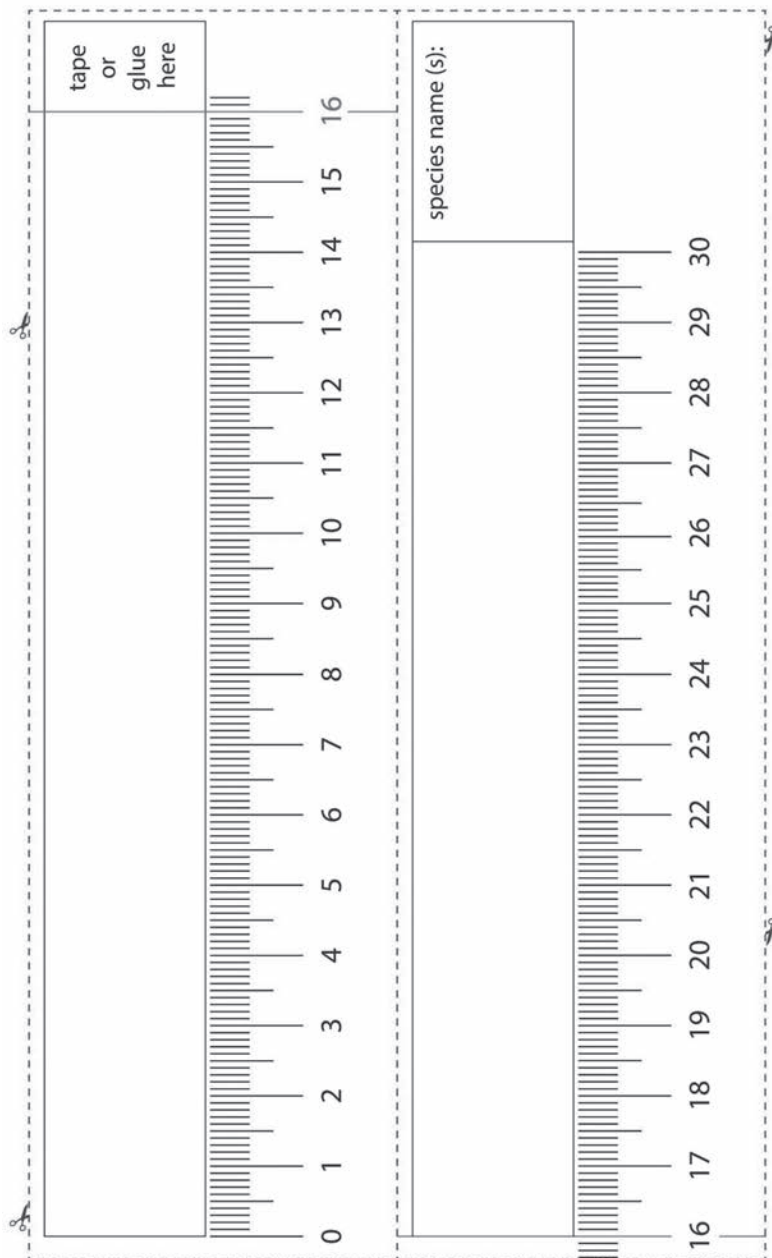


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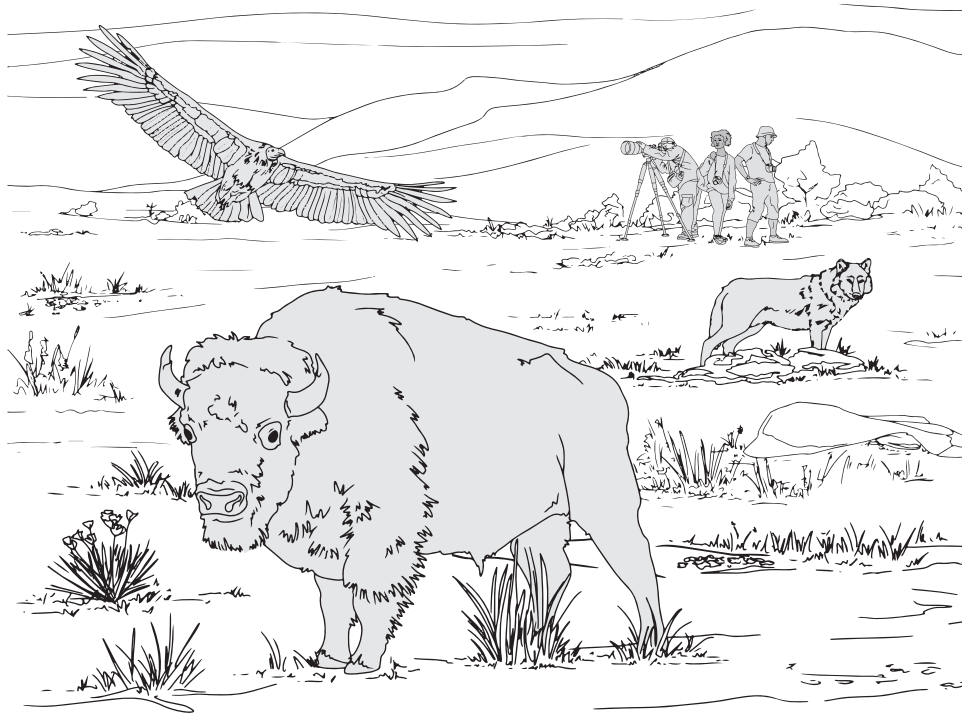
Ecosystem snapshot for bison



Then:



Now:



Field Guide: Horses



	Pleistocene/Holocene ²⁰		Today ²¹	
	Size	Diet	Size	Diet
<i>Equus ferus caballus</i>	43–51 cm (1' 4"–1' 7")	Bushes and young tree shoots	142–183 cm (4' 6"–6") 380–1,000 kg (840–2,200 lb)	Grasses and plant material

The horse family (Equidae) evolved in North America around 54 million years ago and began spreading to Eurasia through the Bering land bridge about 800,000 years ago. However, when the Bering land bridge was covered by water, the North American horses went extinct 11,700 years ago due to climate change.

Modern wild horses (*Equus ferus*) in North America are descendants of European horses, which include the domesticated horse (*Equus ferus caballus*). In the United States, "wild horses" or "mustangs" are untamed horses from the *caballus* subspecies. In the United States, the Bureau of Land Management manages all feral horses.

Key times in history

- The genus *Equus*, which contains modern-day horses and zebras, evolved in North America around 4 million years ago.²²
- Around 2–3 million years ago *Equus* ancestors crossed the Bering land bridge and entered Eurasia.²²
- Around 11,000–13,000 years ago at the end of the last ice age, all species of horse were extinct in North America but others lived in Europe, Asia, and Africa.
- Before their extinction, there were estimated North American horse populations of 100,000 to over a million horses.²³

²⁰ University of Guelph. "Eohippus." 2020. <https://www.equineguelph.ca/equimania/EvolutionTimeline/eohippus.html>.

²¹ Bongianni, Maurizio. *Simon & Schuster's Guide to Horses and Ponies of the World*. New York: Simon & Shuster, 1988.

²² Kirkpatrick, Jay F., and Patricia M. Fazio. "The Surprising History of America's Wild Horses." *LiveScience*. July 24, 2008. <https://www.livescience.com/9589-surprising-history-america-wild-horses.html>.

²³ Orlando, Ludovic, Aurélien Ginolhac, Guojie Zang, Duane Froese, Anders Albrechtsen, Mathias Stiller . . . Eske Willerslev. "Recalibrating *Equus* Evolution Using the Genome Sequence of an Early Middle Pleistocene Horse." *Nature* 499, no. 7456 (2013): 74–78. doi:10.1038/nature12323.



- In the 1500s, horses were reintroduced to the Americas by the Spanish, who set up breeding establishments that allowed horses to be bred in America, rather than being brought over.²⁴
- As of 2021, there are an estimated 71,735 wild horses, or mustangs, in 10 states (AZ, CA, CO, ID, MT, NV, NM, OR, UT, WY).²⁵
- Because no natural predators for wild horses exist today in the United States, populations double every 4 years, so the Bureau of Land Managements removes 10%-20% yearly of the range to control population size.²⁵

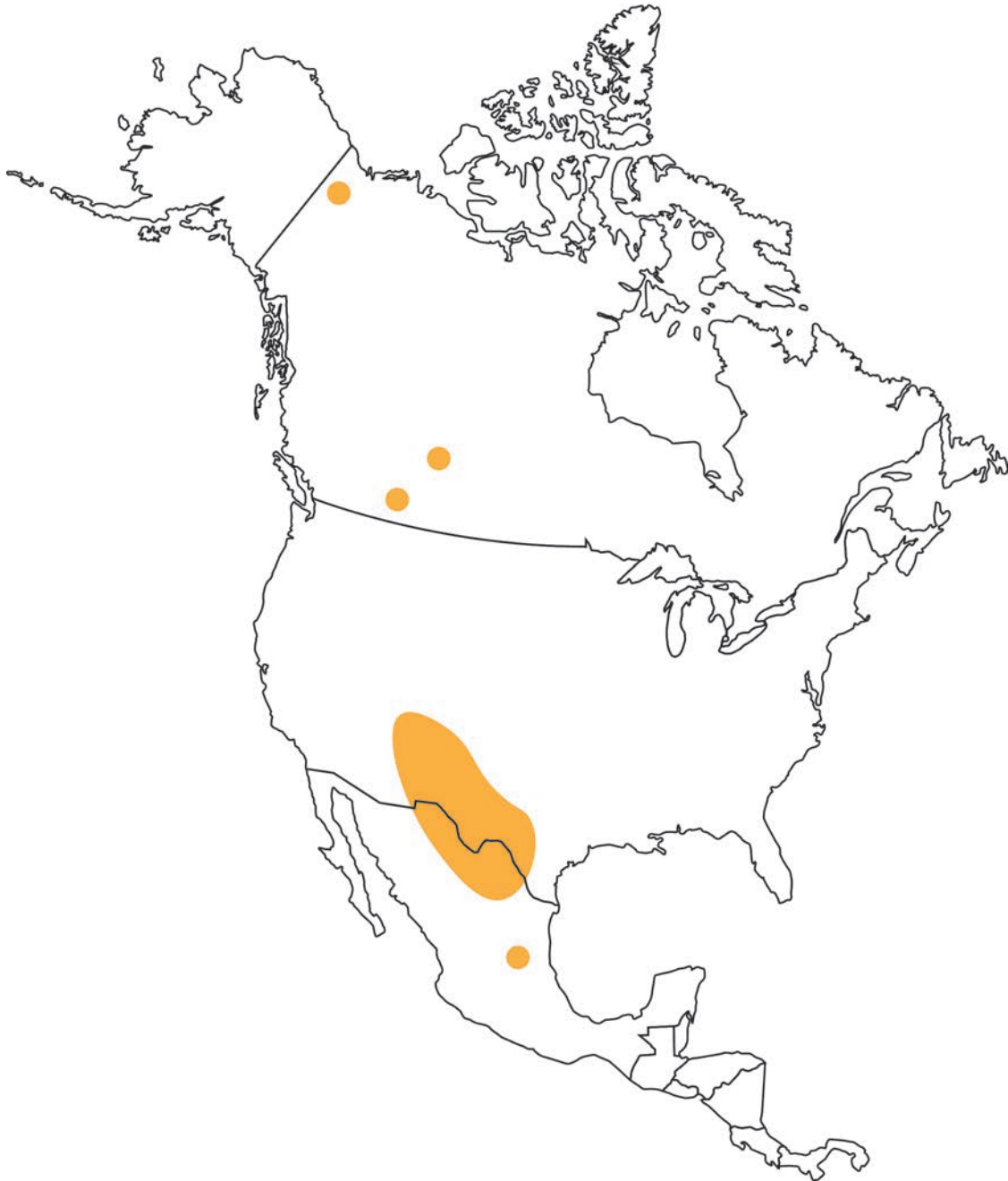
²⁴ Luís, Cristina, Cristiane Bastos-Silveira, E. Gus Cothran, and Maria do Mar Oom. "Iberian Origins of New World Horse Breeds." *The Journal of Heredity* 97, no. 2 (2006): 107–113. doi:10.1093/jhered/esj020.

²⁵ U.S. Bureau of Land Management. "Program Data: Wild Horse and Burro." 2021. <https://www.blm.gov/programs/wild-horse-and-burro/about-the-program/program-data>.

Range Maps



Wild horse (*Equus ferus*) range 15,000 years ago





Wild horse (*Equus ferus*) range today

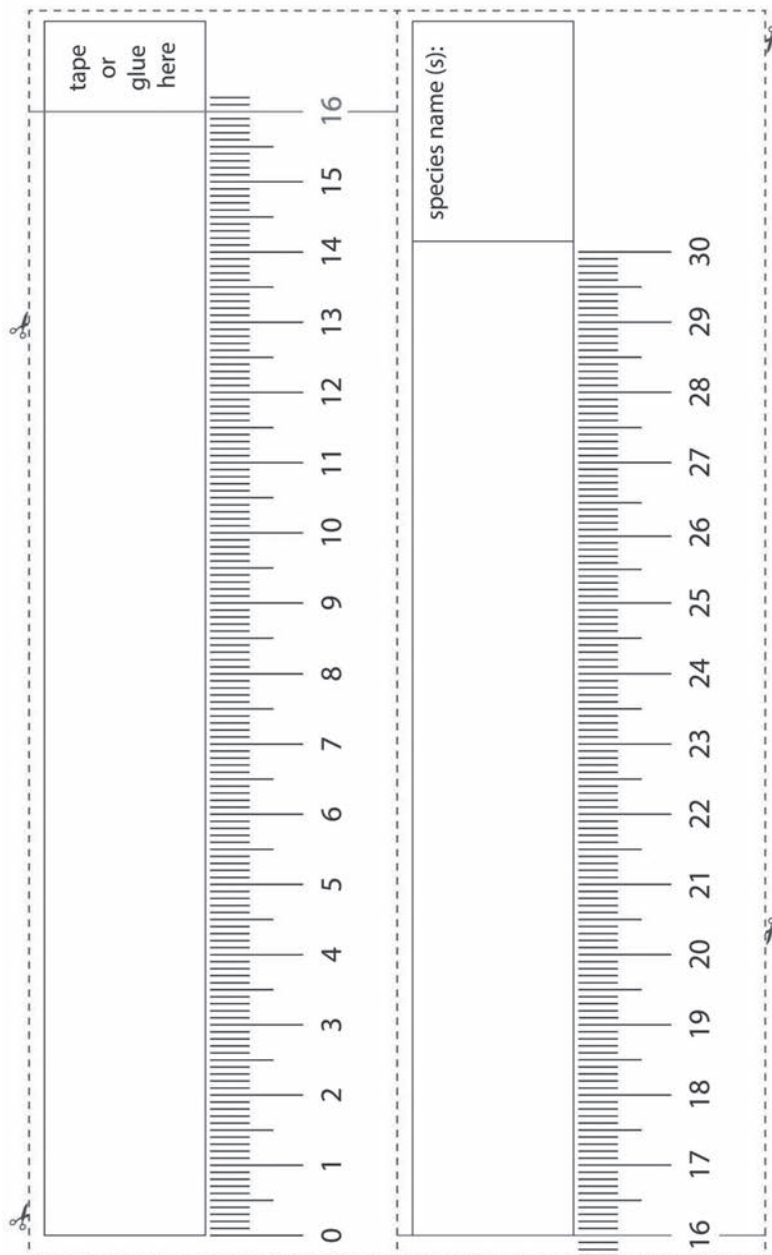




Scale Model of Then and Now Timeline

To create the scaled timeline:

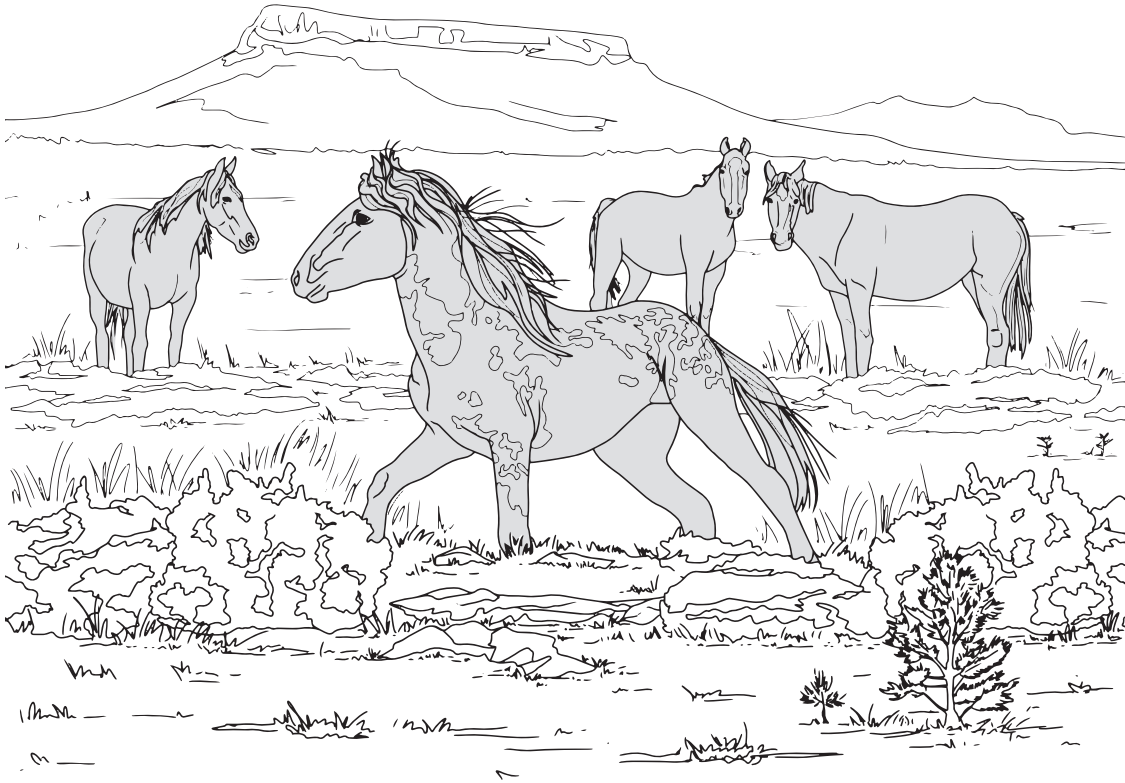
1. Cut out the strips on the dashed lines.
2. Tape or glue the two strips together so you get one strip measuring from 0 cm to 30 cm.
3. Mark the 0 cm end as 15,000 years ago and the 30 cm end as Present.
4. In the blank space, use the information about this species to write when certain events occurred.
 - a. Note: Each centimeter represents 500 years.
 - b. Example: Dire wolves went extinct 11,700 years ago. $11,700 \div 500 = 23.5$ cm from present (this event would go at 6.5 cm)



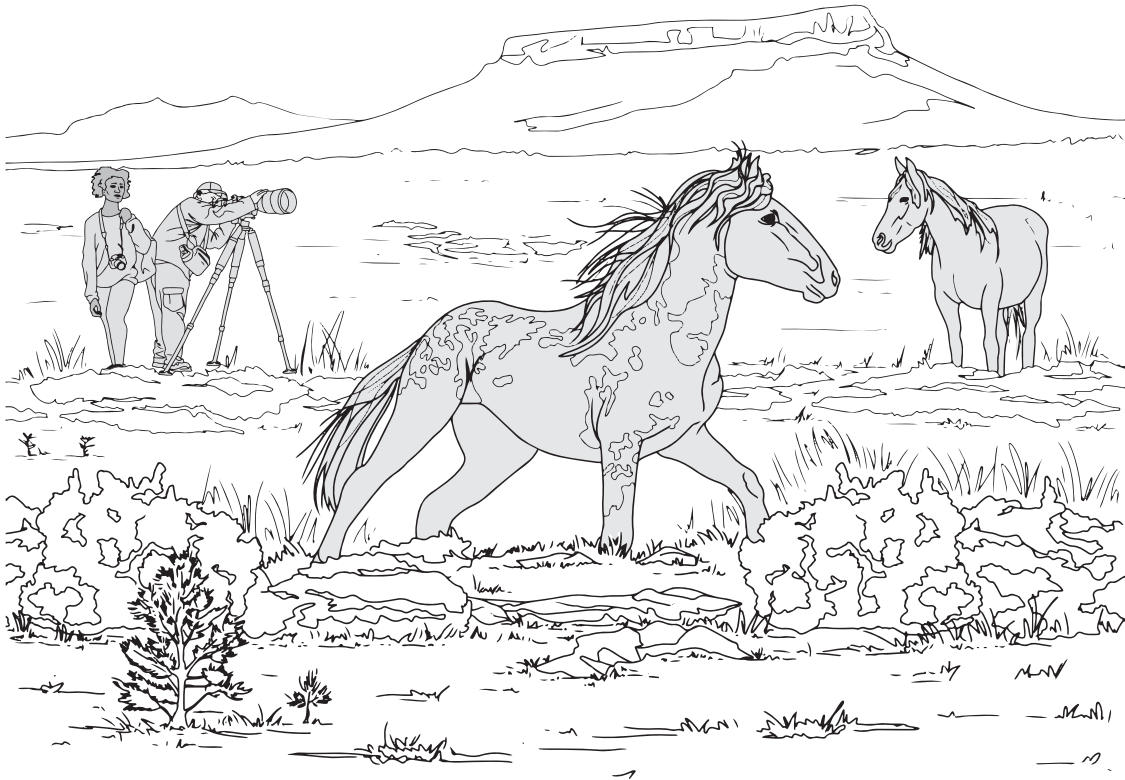
Ecosystem snapshot for horses



Then:



Now:



Field Guide: Manatees



	Pleistocene/Holocene		Today	
	Size	Diet	Size	Diet
Manatee	3,000 pounds	Aquatic vegetation like eel grass	3,000 pounds	Aquatic vegetation like eel grass

West Indies manatees do not have insulating blubber like other marine mammals. They cannot tolerate water temperatures below 68°F for long periods of time. During the summer, manatees can be seen as far north as Massachusetts and as far west as Texas as they search for nutritious aquatic vegetation. Most remain year round in the waters off Florida and southern Georgia. In Texas, fossil manatees provide evidence that even during the end of the last ice age, the Gulf of Mexico may have had warmer water at some points in time.

Manatees have teeth similar to those of elephants.

Key times in history

- The oldest ancestor to manatees were land mammals that could swim and evolved around 40 million years ago.²⁶
- Around 100 million years ago, manatee populations could have been somewhere between 100,000 and 500,000 individuals.²⁷
- By the 1970s, the manatee population was reduced to just a few hundred individuals, primarily due to collisions with boats and habitat loss.²⁸
- Today, the manatee population is estimated at about 13,000 individuals, with a majority of them (6,300) living in Florida.²⁹

²⁶ Benoit, Julien, Sylvain Adnet, Essid El Mabrouk, Hayet Khayati, Mustapha Ben Haj Ali, Laurent Marivaux . . . Rodolphe Tabuce. "Cranial Remain From Tunisia Provides New Clues for the Origin and Evolution of Sirenia (Mammalia, Afrotheria) in Africa." *PLoS One* 8, no. 1 (2013): e54307. <https://doi.org/10.1371/journal.pone.0054307>.

²⁷ Vianna, Juliana A., Robert K. Bonde, Susana Caballero, Juan Pablo Giraldo, Régis P. Lima, Annmarie Clark . . . Fabrício R Santos. "Phylogeography, Phylogeny and Hybridization in Trichechid Sirenians: Implications for Manatee Conservation." *Molecular Ecology* 15, no. 2 (2006): 433–447. <https://doi.org/10.1111/j.1365-294X.2005.02771.x>.

²⁸ Daley, Jason. "Manatees Move From Endangered to Threatened." *Smithsonian Magazine*. April 3, 2017. <https://www.smithsonianmag.com/smart-news/manatee-moves-endangered-threaten-180962758/>.

²⁹ U.S. Fish and Wildlife Service. "West Indian Manatee." 2021. <https://www.fws.gov/southeast/wildlife/mammals/manatee>.

Range Maps



Manatee range 15,000 years ago





Manatee range today





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tape or glue here	species name (s):

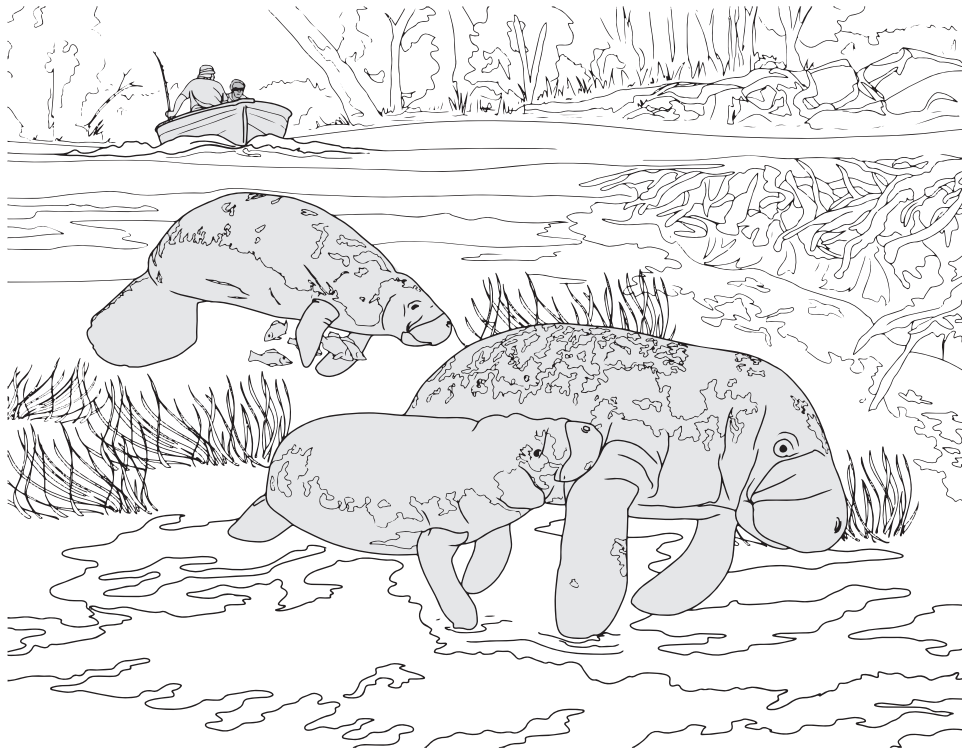
Ecosystem snapshot of manatees



Then:



Now:



Field Guide: Humans



	Pleistocene/Holocene		Today	
	Size ³⁰	Diet	Size ³¹	Diet
<i>Homo sapiens</i>	Females: 154 cm (5' 1") Males: 164 cm (5' 5")	Gathered plants and hunted animals	Females: 159 cm (5' 3") Males: 171 cm (5' 7")	Varied

Key times in history³²

- The oldest human ancestor, *Sahelanthropus tchadensis*, evolved 6–7 million years ago in Africa.
- Around 4 million years ago, other species of human ancestors were walking on two feet (bipedalism) and 800,000 years ago they began using fire.
- The longest lived human species, *Homo erectus*, evolved 1.89 million years ago and went extinct 110,000 years ago due to climate change, making it the longest lived early human species, surviving nine times as long as our own species.
- The modern human species, *Homo sapiens*, evolved in Africa 300,000 years ago.
- Around 90,000 years ago humans almost went extinct due to a drought, with around 10,000 adults surviving.
- Humans began spreading beyond Africa about 60,000 years ago, first thought to have spread to parts of Asia, then to Australia 50,000 years ago, Europe 40,000 years ago, and finally the Americas around 11,000 years ago.
- At the end of the last ice age 11,500 years ago, the estimated global human population size was 1–10 million individuals.³³
- In 2018, the estimated global human population was 7.6 billion individuals.
- In 2018, the human population of North America alone was 583 million individuals.

³⁰ Cox, Samantha L., Christopher B. Ruff, Robert M. Maier, and Iain Mathieson. "Genetic Contributions to Variation in Human Stature in Prehistoric Europe." *Proceedings of the National Academy of Sciences of the United States of America* 116, no. 43 (2019): 21484–21492. doi:10.1073/pnas.1910606116.

³¹ Roser, Max., Cameron Appel, Hannah Ritchie. "Human Height." OurWorldInData.org. <https://ourworldindata.org/human-height>.

³² Smithsonian National Museum of Natural History. "Human Evolution Interactive Timeline." Smithsonian Institution's Human Origins Program. 2021. <https://humanorigins.si.edu/evidence/human-evolution-interactive-timeline>.

³³ Pala, Maria, Anna Olivieri, Alessandro Achilli, Matteo Accetturo, Ene Metspalu, Maere Reidla . . . Martin B. Richards. "Mitochondrial DNA Signals of Late Glacial Recolonization of Europe From Near Eastern Refugia." *The American Journal of Human Genetics* 90, no. 5 (2012): 915–924. doi:10.1016/j.ajhg.2012.04.003

Range Maps



Human range 15,000 years ago





Human range today

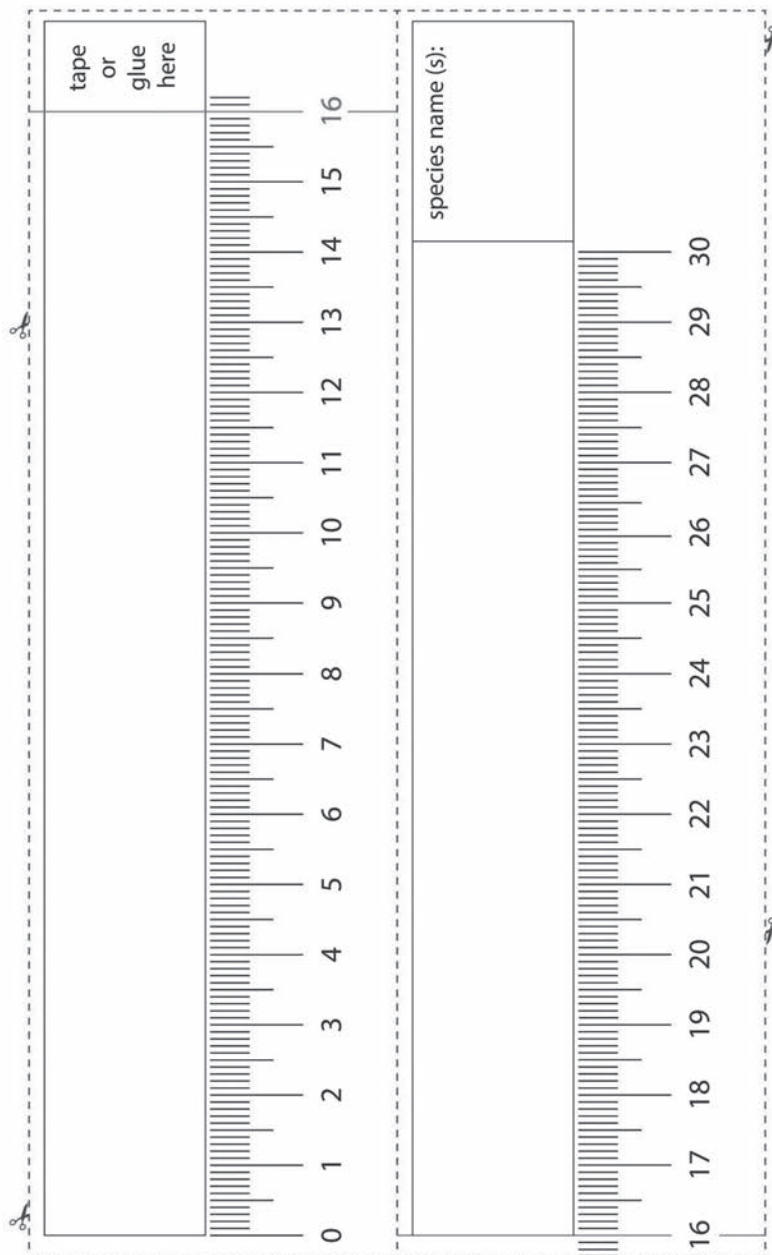




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Ecosystem snapshot of humans



Then:



Now:

