



WAITING FOR THE RAPTOR

LLI/NOVA Forum

PRESENTERS

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THE RAPTORS

▶ EAGLES

- ▶ Bald Eagle

▶ FALCONS

- ▶ Peregrine Falcon
- ▶ American Kestrel

▶ OSPREYS

▶ HAWKS

- ▶ Red-tailed Hawk
- ▶ Cooper's Hawk
- ▶ Sharp-shinned Hawk

▶ OWLS

- ▶ Barn Owl (Ghostly Hunter)
- ▶ Great Horned Owl (The Fierce One)
- ▶ Barred Owl

▶ VULTURES

- ▶ Vulture
- ▶ Black Vulture
- ▶ California Condor

MAJESTIC EAGLES: Kings of the Sky!

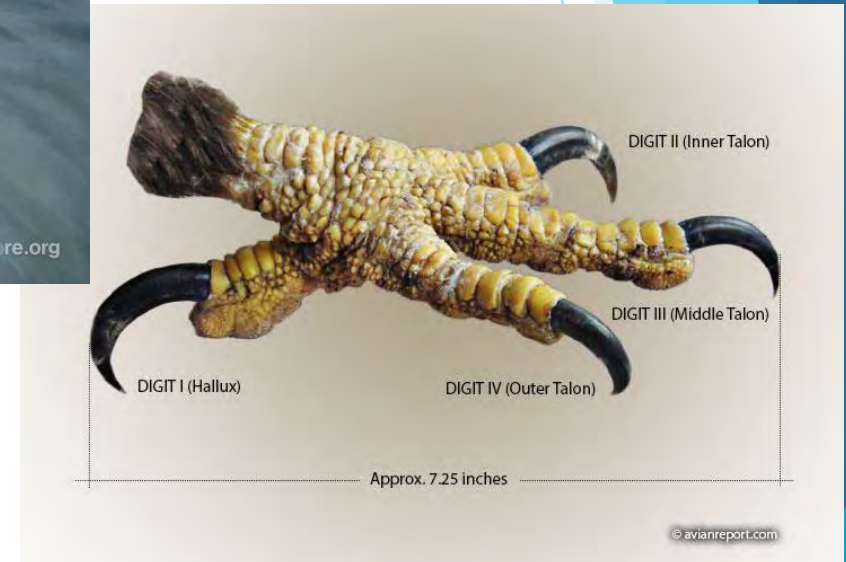


MAJESTIC EAGLES: Kings of the Sky!



- ▶ The proud national bird of the U.S.
- ▶ Large size—6.5 to 8 ft wingspan, 30-40 in height
- ▶ Dark brown body and wings.
- ▶ Soar at high altitudes and dive at lightning speed!

MAJESTIC EAGLES: Kings of the Sky!



- ▶ Large size, powerful beaks, and razor-sharp talons.

BALD EAGLE: The U.S. National Bird



- ▶ Live near lakes, rivers, and coasts across the country
- ▶ Their nests are among the largest in the bird world
- ▶ Some are 9 feet wide and weigh over 2 tons!

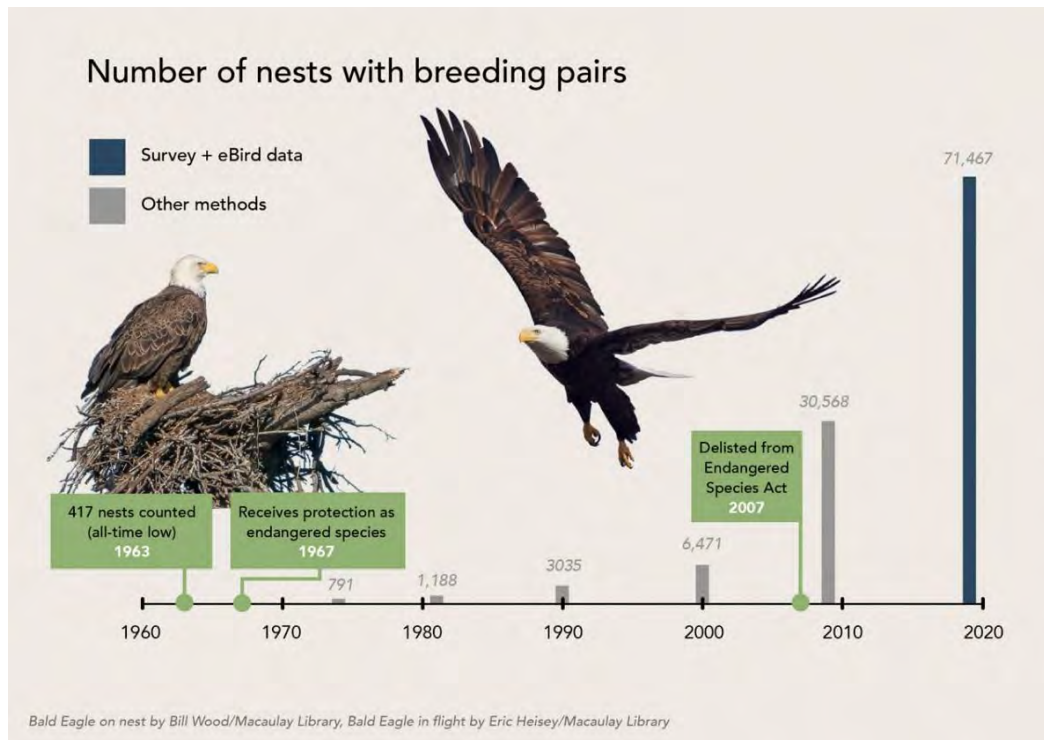
BALD EAGLE: The U.S. National Bird

- ▶ Eat mostly fish, but also small mammals and carrion
- ▶ Are they Really Bald?
 - ▶ Nope! Their white feathers give them that “bald” appearance!
 - ▶ Juveniles are born with dark brown feathers and don’t get their iconic look until 4-5 years old!



CONSERVATION: A Triumph Story!

- ▶ Bald Eagles were once endangered due to habitat loss and DDT pesticides
- ▶ Thanks to the Endangered Species Act, they made an incredible comeback!
- ▶ Golden Eagles now face threats from habitat destruction and wind turbines
- ▶ They are protected under the **Bald and Golden Eagle Protection Act**



KEY TAKEAWAYS



- ▶ Bald Eagles symbolize freedom and strength in the U.S.
- ▶ Golden Eagles are fearless hunters, ruling the open skies.
- ▶ Conservation efforts are vital to protecting these incredible birds!
- ▶ Both species are true kings of the sky!

MEET THE FALCONS: Aerial Assassins!!

- ▶ Slim, pointed wings & long tails—built for speed!
- ▶ High-speed dives (stoops) to strike prey mid-air.
- ▶ Birds, insects, and small mammals.
- ▶ Special breathing system to get enough oxygen at high speeds.
- ▶ Tiny bony tubercles in their nostrils break up airflow, preventing suffocation
- ▶ Form **lifelong pairs** and return to the **same nesting** site yearly
- ▶ Males perform high-speed aerial displays to impress their mates



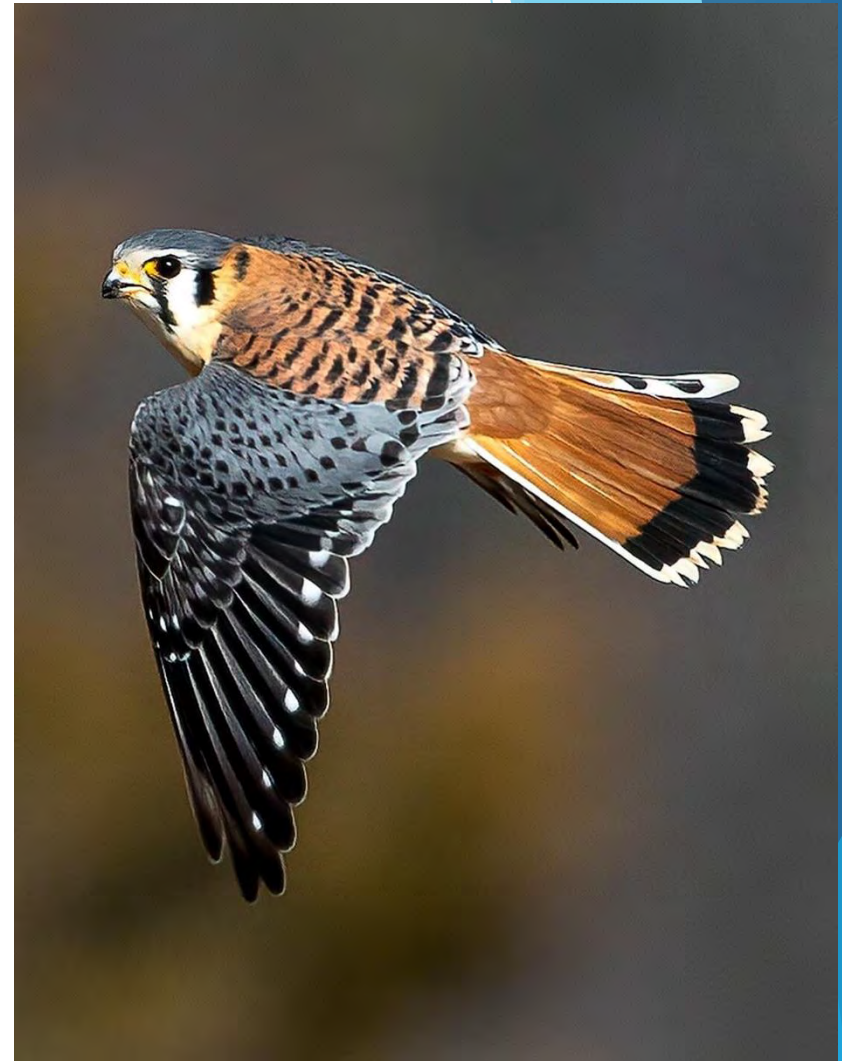
Peregrine Falcon: The Supersonic Hunter!!

- ▶ FASTEST animal on Earth!
Reaches 240+ mph in a dive!
- ▶ 15-20 inches long / 37-43 inch wingspan
- ▶ Built for hunting birds at high speeds
- ▶ Can **spot & strike prey mid-air** with pinpoint precision!
- ▶ Uses its razor-sharp talons to hit prey with stunning force!
- ▶ Nest on skyscrapers & bridges, mimicking cliff ledges
- ▶ **Urban areas** provide plentiful prey like pigeons, songbirds, and starlings
- ▶ The name 'Peregrine' means 'wanderer' due to its long migrations



The American Kestrel: Small but Mighty!!

- ▶ The **smallest falcon** in North America, but a fierce hunter
- ▶ 8-12 inches long / 20-24 inch wingspan
- ▶ See ultraviolet light, helping them track urine trails left by small mammals
- ▶ Insects, small birds, and rodents, sometimes whole!
- ▶ Masters of hovering, a rare skill among raptors



OSPREYS: Unmatched Fishing Specialists



OSPREYS: Unique Raptor!!

- ▶ Long, slender angled wings with a distinct M-shape - bend in flight
- ▶ White head with a dark eye stripe
- ▶ Found near lakes, rivers, and coastlines
- ▶ Expert fishers—a catch out of 4 dives
- ▶ Spot fish even through glare on water - Dives feet-first into for better aerodynamics in flight and catch fish
- ▶ Special Adaptation - Reversible outer toes to hold fish securely
- ▶ Barbed Pads (Spicules) to help grip slippery fish.
- ▶ Have oily, water-resistant feathers that stay dry and efficient when fishing
- ▶ If the catch is too heavy to fly with, it swims to shore using its wings - rare skill among raptors

OSPREYS: Unique Raptor!!

- ▶ Hover before diving, giving them an edge over prey.
- ▶ Travel over 6,000 miles between North and South America!
 - ▶ One of the longest migratory journeys among birds of prey
- ▶ **Monogamous** and return to the same nesting site each year
- ▶ Perform aerial courtship displays to strengthen bonds
- ▶ Build huge nests, some 10 feet deep and 6 feet wide
 - ▶ They reuse and expand their nests year after year
- ▶ Often called “fish hawks” or “sea hawks”
- ▶ Indicators of healthy ecosystems

OSPREYS: Key Takeaways

- ▶ Ospreys are one of the most widespread raptors found worldwide
- ▶ Their adaptations make them unmatched fishing specialists
- ▶ Protecting ospreys means protecting aquatic ecosystems



OWLS: The Silent Hunters of the Night!!



OWLS:

Masters of Stealth, Sight, and Sound

- ▶ Facial discs for enhanced vision and hearing
- ▶ Nocturnal predators that hunt with stealth and precision
 - ▶ Large tubular eyes for extreme depth perception - distinct anatomy that of diurnal raptors
 - ▶ Can also see ultraviolet light helping them detect prey trails
- ▶ Ears give them 3D hearing to locate prey with pinpoint accuracy
 - ▶ Some owls can hear a mouse moving beneath snow or leaves
- ▶ Can't move their eyes - with their 14 neck vertebrae (humans have only 7), rotate their heads 270 degrees
- ▶ Their special blood vessel system prevents circulation from being cut off
- ▶ Deadly Talons - Zygodactyl Feet (2 toes forward, 2 backward) provide an iron grip on prey
 - ▶ Their talons can crush bones and hold struggling prey



Great horned owl

OWLS:

Masters of Stealth, Sight, and Sound

- ▶ Silent flight thanks to specialized feathers - surprise prey with total silence
 - ▶ Their feathers have serrated edges that reduce noise
- ▶ Often swallow prey whole, bones and all
 - ▶ Later, they regurgitate pellets containing fur and bones
- ▶ Can catch prey larger than themselves, like rabbits or even other birds
- ▶ Deadly Beaks to capture prey efficiently
- ▶ Their powerful talons and beaks make them deadly predators



Barn Owl

OWLS:

Masters of Stealth, Sight, and Sound

- ▶ Most don't build their own nests—they use tree cavities, burrows, or old nests from other birds
- ▶ Owls use various sounds to communicate and defend their territory
- ▶ But not all hoot, **Barn Owls** screech or hiss



Barn owl

OWLS:

Masters of Stealth, Sight, and Sound

- ▶ Not all night hunters, the **Snowy Owl** and **Northern Hawk Owl**, unlike most, are diurnal hunters
- ▶ Found everywhere except Antarctica (from forests to deserts) owls thrive in many habitats
- ▶ They are one of the most adaptable bird species



Snowy Owl



Northern Hawk Owl

OWLS:

Masters of Stealth, Sight, and Sound

Eastern Screech Owl

- ▶ Small, short ear tufts, dark bill, gray



Barred Owl

- ▶ Large, hornless, brown to gray, nest in cavities
- ▶ White bars on the front and back
- ▶ 15-25 in length and 40-50 in wingspan



OWLS: Key Takeaways

- ▶ Owls are some of the most skilled, stealthy, and fascinating predators in nature
- ▶ They rule the night with unmatched vision, hearing, and silent flight
- ▶ They help control rodent populations, keeping ecosystems balanced
- ▶ Protecting owls means protecting nature's natural pest controllers



HAWKS: The Fearless Hunters of the Sky



Red-tailed Hawk and American Kestrel

HAWKS:

Speed, Power, and Precision in Every Flight!

- ▶ Broad wings, long tails, and strong talons
- ▶ Known for their stealth. Use thermal air currents to soar effortlessly without flapping their wings for long silent periods waiting for the perfect opportunity to strike
- ▶ Can see a wide range of colors, including ultraviolet light - tracking small mammals that leave urine trails
- ▶ **Vision 8 times sharper than humans** - can spot a mouse from over 100 feet in the air!
- ▶ Use their sharp talons to capture and kill prey—small mammals, birds, reptiles

HAWKS:

Speed, Power, and Precision in Every Flight!

- ▶ Mostly females are larger than males - reduce competition for food between the sexes and allows females to protect nests more effectively
- ▶ Mate for Life. Many hawk species, like Cooper's Hawks and Red-tailed Hawks, form lifelong pair bonds
- ▶ Very territorial and will fiercely defend their nesting and hunting areas from intruders, including other hawks
- ▶ Often return to the same nesting sites year after year

RED-TAILED HAWK



- ▶ The most common and widespread hawk in the U.S., recognized by its reddish-brown tail
- ▶ It can dive at speeds of up to **120 mph** when pursuing prey.
- ▶ It can consume thousands of rodents each year, acting as a natural pest control system.
- ▶ The grip can reach up to 200 pounds per square inch!
- ▶ Its iconic scream is often used in movies, even for other birds like eagles.

SHARP-SHINNED HAWK



Juvenile



Mature

- ▶ The **smallest** hawk in North America
- ▶ It's often mistaken for Cooper's Hawk due to their similar coloration.
- ▶ Found in forests across the U.S., especially during migration.

COOPER'S HAWK



- ▶ Medium-sized hawk with short, rounded wings and a long tail, ideal for navigating forests
- ▶ Known for its agility, it can chase prey through dense trees
- ▶ Found across the U.S. in woodlands and suburban areas
- ▶ Small to medium birds, such as pigeons and doves

VULTURES: Masters of the Sky!!



VULTURES:

The Ultimate Cleanup Crew!!

- ▶ Bald heads and large wings
- ▶ Keen smell or sharp eyesight to find carrion
- ▶ Master Gliders
 - ▶ Soar for hours without flapping their wings
 - ▶ Use thermal air currents to stay aloft with minimal effort
- ▶ When threatened, they vomit highly acidic stomach contents on predators
 - ▶ This defense mechanism repels attackers and lightens their body for escape

VULTURES:

The Ultimate Cleanup Crew!!

- ▶ 100% Scavengers—cleaning up the environment
 - ▶ Eat decaying meat that would make other animals sick
 - ▶ Their highly acidic stomachs destroy deadly bacteria & viruses - stopping diseases spread
- ▶ Immune to diseases that kill other animals
 - ▶ Can consume anthrax, rabies, and botulism without harm
- ▶ Spread their wings in the sun to kill bacteria
 - ▶ Sunbathing helps dry their feathers and maintain body temperature

TURKEY VULTURE - The Smell Expert



- ▶ Can detect rotting meat from 5 miles away
- ▶ One of the strongest noses in the bird world

BLACK VULTURE - Master of Sight



- ▶ Unlike Turkey Vultures, they lack a strong sense of smell
- ▶ Use sharp eyesight and follow Turkey Vultures to find food

CALIFORNIA CONDOR - Story of Survival

- ▶ Once nearly extinct, now making a slow comeback
- ▶ Conservation efforts are crucial to save this species



California condor flying below a turkey vulture

THREATS

- ▶ Poisoned by lead bullets and pesticides
- ▶ Habitat destruction and reduced food sources threaten populations!



A healthy fledgling turkey vulture.
Courtesy of Todd Backman



The same fledgling turkey vulture after it was found sickened by rat poison and collapsed in the patio of a El Cerrito, California, home.
Courtesy of Patricia Jones

VULTURES: Key Takeaways

- ▶ Essential for the health of our planet!
- ▶ Their highly acidic stomachs destroy deadly bacteria & viruses
- ▶ Without them, diseases could spread rapidly
- ▶ Protecting them means protecting ecosystems and public health
- ▶ They may not be the prettiest birds, but they are among the most important!

QUESTIONS & ANSWERS



Photo Credits, part 1

- ▶ Slide 1, *Waiting for the Raptor*, A bald eagle brings a fish to its nest at Occoquan Bay Refuge., John Eppler, Public Domain, <https://www.fws.gov/media/bald-eagle-brings-fish-its-nest-occoquan-bay-refuge>
- ▶ Slide 2, *Presenters*, Osprey, juvenile, New York City, New York, Francois Portmann/Audubon Photography Awards
- ▶ Slide 4, *Majestic Eagles*
 - ▶ Bald eagle: Paul Friel, Wikimedia Commons, CC BY 2.0, https://commons.wikimedia.org/wiki/File:Bald_Eagle_-_%22Helga%22_-_Haliaeetus_leucocephalus2.jpg
 - ▶ Golden eagle, US Fish and Wildlife Service, Public Domain, <https://www.fws.gov/media/bald-and-golden-eagles>
- ▶ Slide 5, *Majestic Eagles*
 - ▶ American Bald Eagle Diving toward River, Stephen L Tabone, <https://stevetaboneblog.com/2012/12/09/american-bald-eagles-at-conowingo-dam-2/american-bald-eagle-dec-4-4/>
 - ▶ American Bald Eagle Catching a Fish, Stephen L Tabone, <https://stevetaboneblog.com/2012/12/09/american-bald-eagles-at-conowingo-dam-2/american-bald-eagle-dec-4-3/>
- ▶ Slide 6, *Majestic Eagles*
 - ▶ Bald eagle tongues and beaks!, Raptor Resource Project (from explore.org), <https://www.raptorresource.org/2023/04/11/bald-eagle-tongues-and-beaks/>
 - ▶ All About Bald Eagle Talons, Avian Report, <https://avianreport.com/bald-eagle-talons/>
- ▶ Slide 7, *Bald Eagle*, Bald Eagle, Andrew Sentipal/Audubon Photography Award
- ▶ Slide 8, *Bald Eagle*, Bald Eagle, Baoting Chen/Audubon Photography Awards

Photo Credits, part 2

- ▶ Slide 9, *Conservation*, Bald eagle count quadruples, thanks in part to eBird data boost, Cornell Lab of Ornithology, <https://news.cornell.edu/stories/2021/03/bald-eagle-count-quadruples-thanks-part-ebird-data-boost>
- ▶ Slide 10, *Key Takeaways*, Bald eagle at Sam D. Hamilton Noxubee National Wildlife Refuge in Mississippi, U.S. Fish & Wildlife Service, <https://www.fws.gov/media/bald-eagle-sam-d-hamilton-noxubee-national-wildlife-refuge-mississippi>
- ▶ Slide 11, *Meet the Falcons*
 - ▶ Peregrine Falcon and Purple Gallinule, Orlando Wetlands Park, Orange county, Florida, Frank Haluska/Audubon Photography Awards
 - ▶ American Kestrel, female, Will Sooter/Audubon Photography Awards
- ▶ Slide 12, *Peregrine Falcon*, Peregrine Falcon, Palisades Interstate Park, Bergen county, New Jersey, Harry Collins/Audubon Photography Awards
- ▶ Slide 13, *The American Kestrel*, Adult Male American Kestrel (Northern), Photo © Alex Shipherd / Macaulay Library, <https://nestwatch.org/learn/focal-species/american-kestrel/>
- ▶ Slide 14, *Ospreys*, Osprey fishing in the rapids of the Rappahannock River in Fredericksburg VA. Edward S. Episcopo, <https://www.cbf.org/blogs/save-the-bay/2021/04/nature-journaling-return-of-the-fish-hawks.html>
- ▶ Slide 17, *Osprey*, Joseph Ferlito/Audubon Photography Awards
- ▶ Slide 18, *Owls*, Chuck Homler d/b/a Focus On Wildlife, CC BY-SA 3.0, via Wikimedia Commons
- ▶ Slide 19, *Owls*
 - ▶ Great Horned Owl, Martin Schiff/Audubon Photography Awards
 - ▶ Great Horned Owl, Cleve Nash/Audubon Photography Awards

Photo Credits, part 3

- ▶ Slide 20, *Owls*, Barn owl with rodent prey, Clinton McDonald, <https://www.hawkmountain.org/raptors/barn-owl>
- ▶ Slide 21, *Owls*
 - ▶ Barn Owl, © Bill Lea, <https://dwr.virginia.gov/blog/virginias-most-mysterious-birds/>
 - ▶ Owl calls: All About Birds, Cornell Lab of Ornithology, <https://dl.allaboutbirds.org/owl-sounds-cam>
- ▶ Slide 22, *Owls*
 - ▶ Northern Hawk Owl, Ontario, Barb D'Arpino/Audubon Photography Awards
 - ▶ Snowy Owl flying, US Fish and Wildlife Service, Lucas DeCicco, <https://www.fws.gov/media/snowy-owl-flying>
- ▶ Slide 23, *Owls*
 - ▶ Eastern Screech Owl, gray morph, Liam McGranahan, <https://loudounwildlife.org/2012/07/eastern-screech-owl/>
 - ▶ Barred Owl, © Cynthia Rand, <https://blogs.massaudubon.org/yourgreatoutdoors/take-5-barred-owls/>
- ▶ Slide 24, *Owls*, American Barn Owl, Alameda County, California, Sue Griffin/Audubon Photography Awards
- ▶ Slide 25, *Hawks*, Red-tailed Hawk and American Kestrel, female, Kate Davis/Audubon Photography Awards
- ▶ Slide 28, *Red-tailed Hawk*, Red-tailed Hawk, Tom Muehleisen/Audubon Photography Awards
- ▶ Slide 29, *Sharp-shinned Hawk*
 - ▶ A juvenile Sharpie perches on a branch waiting to make it's move on a feeder full of Chickadees, National Park Service, Ed Sharron, <https://www.nps.gov/articles/netn-species-spotlight-sharp-shinned-hawk.htm>
 - ▶ Sharp-shinned Hawk, All About Birds, https://www.allaboutbirds.org/guide/Sharp-shinned_Hawk/id

Photo Credits, part 4

- ▶ Slide 30, *Cooper's Hawk*, Cooper's Hawk, Pamela Kopen/Audubon Photography Awards
- ▶ Slide 31, *Vultures*, Turkey vulture in flight. Bolsa Chica Ecological Reserve, California, USA, Peterwchen, Wikimedia Commons, CC BY-SA 4.0
- ▶ Slide 34, *Turkey Vulture*
 - ▶ Turkey Vulture flying, Gilbert, Arizona, Mick Thompson, Audubon
 - ▶ Turkey Vulture head, Smithsonian Insider, Photo by Dario Niz / Wikimedia Commons, <https://insider.si.edu/2017/12/scientists-in-awe-of-huge-olfactory-bulb-found-in-turkey-vulture-brain/>
- ▶ Slide 35, *Black Vulture*
 - ▶ Black Vulture and Turkey Vulture, Edinburg, Texas, Gary Leka/Audubon Photography Awards
 - ▶ Black Vulture head, Collier county, Florida, Elizabeth Grafton Cardwell/Audubon Photography Awards
- ▶ Slide 36, *California Condor*, California condor flying below a turkey vulture, National Park Service, Gavin Emmons, <https://www.nps.gov/articles/000/california-condor-in-the-pacific-northwest.htm>
- ▶ Slide 37, *Threats*, High Country News, Turkey vultures in California are testing positive for rat poison, Todd Backman and Patricia Jones, <https://www.hcn.org/articles/turkey-vultures-in-california-are-testing-positive-for-rat-poison/>
- ▶ Slide 39, *Questions and Answers*, Bald eagle at Sam D. Hamilton Noxubee National Wildlife Refuge in Mississippi, U.S. Fish & Wildlife Service, <https://www.fws.gov/media/bald-eagle-sam-d-hamilton-noxubee-national-wildlife-refuge-mississippi>