Crane Trunk Guide

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THE INTERNATIONAL CRANE FOUNDATION

About

Our Mission

The International Crane Foundation (ICF) works worldwide to conserve cranes and the ecosystems, watersheds, and flyways on which they depend. We provide knowledge, leadership, and inspiration to engage people in resolving threats to cranes and their diverse landscapes.

Our Reach

From our nearly 300-acre headquarters in Baraboo, Wisconsin, USA our reach extends across the globe. We maintain a regional base in China and share program offices with partner organizations in Cambodia, India, South Africa, Texas, Vietnam, and Zambia. Our approximately 80 staff work with a network of hundreds of specialists in over 50 countries on five continents.

Our Vision

The International Crane Foundation is committed to a future where all 15 of the world's crane species are secure. Through the charisma of cranes, we envision a future where people work together to protect and restore wild crane populations and the landscapes they depend on – and by doing so, find new pathways to sustain our water, land, and livelihoods.

The Story of ICF

Cranes are a charismatic family of birds, found on five of the seven continents. People living near cranes usually have a profound reverence for these magnificent birds. Among the people captivated by the beauty and mystique of cranes were two Cornell University graduate students—George Archibald and Ron Sauey—who met in 1971. George was investigating crane behavior, while Ron was studying the ecology of Siberian Cranes in India. Realizing that cranes were under intense pressure from rapidly developing industrial and agricultural expansion, George and Ron decided to establish an organization dedicated to the study and preservation of cranes. In 1973, they founded the International Crane Foundation (ICF) on the horse farm owned by Ron's parents just north of Baraboo, Wisconsin.

Location and Contact Information

International Crane Foundation

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Baraboo, WI 53913

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CRANE TRUNK INVENTORY

Learning occurs not only with the mind, but also with the eyes, the hands – the whole child (or adult!). Items contained in the trunk are meant to be examined, handled, and shared with your students. Of course, some items, like the crane skull, are fragile, so please handle with extreme care. If an item is damaged in your care, you will be responsible for replacing that item. Check that every crane trunk item is in good shape when it arrives, so you are not held responsible for someone else's damage.

Whenever possible, we included real crane artifacts in the trunk for your students to examine. However, because whooping cranes are an endangered species, and certain artifacts are difficult to obtain, some items included are replicas. When replicas are used, it is noted in the inventory below. To understand more about the biological artifacts in the cart, check out **"Whooping Crane and Sandhill Crane Biology"** (pg. 12).

The Crane Trunk is supplied with the following educational materials:

- 1 hand lens
- 1 Sandhill Crane skull (replica)
- 1 Wattled Crane leg (replica)
- 3 Crane Feathers
- 1 Whooping Crane egg (replica)
- 1 radio transmitter
- 2 leg bands
- 1 Whooping Crane puppet head and costume
- 1 crane chick plushie
- 1 flight diverter
- 1 food box with rubber food items
- 1 bag of "crane chow"
- Crane Photo Collection
- Whooping Crane Flyways map
- "All of the Whooping Cranes in the World" sign
- Cranes of the World Poster

The Crane Trunk is supplied with the following educational handouts:

- Large waterbird ID guides
- "I Give a Whoop" stickers

The Crane Trunk is supplied with the following activities:

- The Quality of Cranes: A Little Book of Crane Lore
- Crane Song DVD
- K-12 educational activities – on jump drive
- Crane Trunk Training Guide – on jump drive

CRANE PHOTO COLLECTION

Whooping Crane Nests and Eggs

Black Flies on a Whooping Crane Egg: Photo by Hillary Thompson

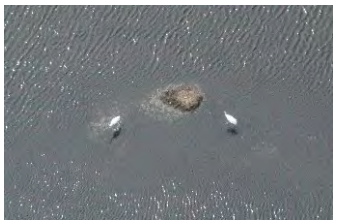
Whooping Cranes in Wisconsin primarily breed in Horicon NWR, Necedah NWR, and White River Marsh State Wildlife Area because this is where Whooping Cranes were most frequently released in the reintroduction program. Necedah NWR, however, has an annual black fly emergence that overlaps with the start of the Whooping Crane nesting season. For this reason, ICF practices double clutching. For the first clutch of eggs that are laid they go out and collect them to costume rear the hatched chicks back at their headquarters. This gives the wild Whooping Cranes reprieve from the black flies who bite and disturb them while they sit on the nest, and it allows them to renest again a little bit later in the summer where they may be more successful because the black fly emergence is short lived and will die down by then.

Whooping Crane Chick Hatching: Photo by Tom Lynn

A Whooping Crane chick emerges from its shell. Chicks have a tiny horn like projection on the tip of their beak which allows them to chip away at the shell and break out of the egg when it comes time for them to hatch. While hatching it can take a few hours to a full day for a bird to completely hatch.

Whooping Crane Chick Hatching: Photo by Joel Satore

Whooping Crane chicks hatch in a few hours to a full day, and when they emerge from the shell they are wet and tired. The first thing these chicks need to do is rest and dry off so that they can warm up. Drying off is very important because at this time chicks only have downy feathers so they do not have water repellant feathers like adults do and they can get very cold very quickly. In the wild, a chick will hatch and brood under its parents' wings while it dries off and warms up.



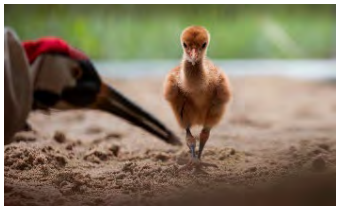
Whooping Crane Nest Exchange: Photo by Eva Szyszkoski
Both the adult male and the adult female Whooping Crane sit on the nest and take turns incubating. Here we see a typical Whooping Crane nest, which is a mound of vegetation surrounded by water with 2 eggs on the nest, and we see one adult leaving while the other adult is returning to sit on the nest. As you can see here, you cannot tell the male and female apart. This is because they are sexually monomorphic.

Whooping Crane Eggs on a Nest: Photo by Bizeau
2 Whooping Crane eggs sit on a nest. Nests are constructed of dried dead marsh vegetation (cattail and bulrush), not sticks. Nests are typically 2-5 feet across and they are large flat mounds with a shallow depression for the eggs. Whooping Cranes will lay between 1-2 eggs and these eggs are tan with brown splotches to help them camouflage in the brown nest.

Whooping Crane Attending to its Nest: Photo by Ted Thousand
An adult Whooping Crane is attending to its two eggs on its nest. To take care of these eggs the incubating adults will sit on them to provide warmth, rotate them regularly, and shade them when it is too hot to sit. Egg rotation is vitally important to an embryo's survival because it evenly distributes temperature and prevents the sides of the fluid sac surrounding the embryo from getting stuck to the inside of the shell. Adults will incubate their eggs for 29 to 31 days.

Whooping Crane Adult and Chick: Photo by Raymond Rupnow
A Whooping Crane prepares to sit down in its nest where it will brood its chick. Brooding is very important for the early development of a chick because they need to be kept warm. Chicks do not have the proper feathers to retain heat and delf regulate their temperature, so they rely on warmth provided from their parent. It is also important to note here that the chick is a cinnamon/brown, like the egg, and it is for the same reason. This color allows them to camouflage better in the marsh and on their nest.

Costume Rearing



Whooping Crane Chick: Photo by Tom Lynn

A costumed head is preparing to feed a very young Whooping Crane chick. This chick is being raised in captivity by costumes with puppet heads that look like adult Whooping Cranes. This is done because the captive rearing facility does not have enough adult pairs who are suitable parents to raise all of the chicks, considering a pair typically raises only 1 chick each year, and chicks imprint. Imprinting is when an animal, such as a bird, decides that whatever is caring for them must be what it is. So if a human raises a Whooping Crane it will want to spend time by humans. This becomes an issue when birds are trying to breed, and for the survival of the wild populations of Whooping Cranes, wild Whooping Cranes should want to be around and breed with other Whooping Cranes.

Costume Rearing: Photo by ICF's Crane Conservation Department

At ICF's off exhibit costume rearing facility, staff wear costumes that hide their body shape and share key characteristics with Whooping Cranes. These are a red crown, black mustache, yellow eye, black/gray beak, long white neck, tall white body, black feet (rubber boots). These costumes spend every day raising the chicks and teaching them how to be strong wild birds.

Chicks and a Costume Foraging: Photo by Tom Lynn

Costumes raise the chicks as a flock which involves socializing them to get along and then they teach them how to be strong wild birds. This involves showing them where to drink water and encouraging them to drink, showing them how to forage for food and catch frogs or insects, and giving them exercise so they can develop strong flight muscles for when they are in the wild.

Whooping Crane Chick and a Costume: Photo by Tom Lynn

A Whooping Crane chick runs after a costume. Whooping Crane chicks are precocial. This means they are up and moving within 24 hours of hatching. They also grow very quickly. They can grow about an inch a day and by the time they are three months old they are almost as tall as adult Whooping Cranes, which stand at 5 feet tall.

Chick Rearing Facility: Photo by Tom Lynn
The off-exhibit chick rearing facility where Whooping Crane chicks are raised by costumes. This area has wetlands for chicks to forage and drink water and it has tall flight netting to allow for low flights and runs around the yard. Outside of the facility there is prairie and as the chicks get older, they use this space with the costumes, and they practice taking flight. Strong flight muscles are necessary for the survival of wild birds entering a migratory population.

Whooping Crane Juveniles

Whooping Crane Juvenile: Photo by Tom Lynn
A juvenile Whooping Crane preening its feathers. As a juvenile Whooping Crane develops flight feathers after the downy feathers it hatches with, the feathers that come in are not completely white. They are still a bit of a cinnamon color. This helps the juvenile chicks blend in with their environment for the first 1 year of their life until they become completely white like all adult Whooping Cranes.

Whooping Crane Juveniles with Wings Spread: Photo by Tom Lynn
Whooping Crane juveniles are almost the same height as adult Whooping Cranes (5 ft tall), but they are a more cinnamon color than white. They do appear to be whiter on the underside of their body and they have black wingtips, just like the adult Whooping Cranes.

Whooping Crane Juveniles Flying: Photo by Tom Lynn
Whooping Crane juveniles taking flight over a prairie. The juveniles at ICF are raised as a flock and go through major developmental stages together. They are also taught to socialize and behave with one another and not be aggressive towards one another.

Color Bands and Radiotelemetry

Color Banded Family: Photo by Hillary Thompson
A family of Whooping Cranes in a marsh habitat are pictured here and in this we can see that the adults have colorful leg bands. These colorful leg bands are essential for identifying the Whooping Cranes you spot and are commonly used on all sorts of migratory birds. Each bird is given a unique combination of colors so over time after

a bird has been spotted multiple times, biologists can get an idea of the habitats and spaces an individual is using, milestones they reach as they age, and other birds they are socializing with.

Radio transmitter: Photo by Ted Thousand
In this photo the adult Whooping Crane has colored leg bands and one band with a long black antenna hanging off of it. That is the radio transmitter and that will give off a unique radio frequency that can be detected by antennas. Biologists use these antennas to track the wild Whooping Cranes so they can study then and gather more information about their life history, habitats, causes of mortality, etc.

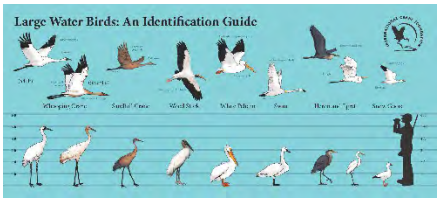
Whooping Cranes and Sandhill Cranes

Whooping Crane with Sandhill Cranes I
A Whooping Crane amongst a flock of Sandhill Cranes. Whooping Cranes do not form large flocks like Sandhill Cranes do. They typically remain in their family group or with their mate throughout the year. Sandhill Cranes, on the other hand form large flocks before migration, with some flocks in the 1000s of birds.

Whooping Crane with Sandhill Cranes II: Photo by George Archibald
Whooping Crane adult and juvenile with Sandhill Cranes. When the birds are all together you can really see their differences. Sandhill Cranes are a slate gray/rust color with a red crown and stand 4 feet tall. Adult Whooping Cranes are all white with a red crown and black mustache and stand 5 feet tall. Juvenile Whooping Cranes are a mix of white and cinnamon, have a red crown and black mustache, and stand 4.5-5 feet tall.

Whooping Crane with Sandhill Cranes: Photo by Hillary Thompson

Adult Whooping Cranes look very similar to Sandhill Cranes in many ways but have some key differences. Both birds have long legs and long necks. While Sandhill Cranes are a slate gray/rust and have a red crown, Whooping Cranes are all white with a red crown and black mustache. When they open their wings, you can see that their wing tips are black.



Large Waterbird ID Guide: ICF

Whooping Cranes may be difficult to distinguish in flight. This handy guide can be used to differentiate Whooping cranes from other large waterbirds who may be easily misidentified as Whooping Cranes.

Whooping Crane Diet

Costume Feeding a Chick: Photo by Tom Lynn

A costumed crane keeper feeds a Whooping Crane chick a clover. Costumed keepers raise chicks and teach them how to be successful wild birds and one of the things they do is teach them which foods are good to forge. Those include clovers, frogs, dragonflies, roots of aquatic vegetation (arrowhead), mealworms, etc. Cranes are omnivores so they eat plants and animals.

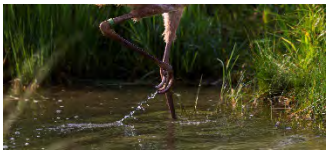
Whooping Crane Adult Feeding a Chick: Photo by Joel Satore

An adult Whooping crane feeds a chick an insect. Notice in this photo the adult's behavior is being copied in the image of the costumed keeper feeding a Whooping Crane chick. In order to be a successful Whooping Crane parent in a costume, the keepers need to understand the adults' behaviors when raising a chick so they can mimic these behaviors.

Whooping Crane and a Crayfish: Photo by John Ford
Whooping Cranes are omnivores, and one large part of their diet are crustaceans, such as crayfish, which can be found in wetlands across the United States. In their wintering grounds in Texas, the historic population relies on blue crabs to make up a large portion of their diet and can even eat up to 80 in one day! They rely on blue crabs so much so that blue crab abundance can even be linked with wintering ground mortality for Whooping Cranes. Blue crab abundance can be determined by the salinity of the estuaries that Whooping Cranes feed in, and a higher salinity results in less blue crab abundance.

Whooping Crane and a Snake: Photo by Louisiana Dept. of Wildlife and Fisheries
Whooping Crane diets also consist of reptiles such as snakes. In this photo of a Whooping Crane in Louisiana it has a venomous cottonmouth in its beak!

Whooping Crane Anatomy



Whooping Crane Feet: Photo by Tom Lynn
Whooping Crane legs and toes are one of their many wetland specializations. Their long legs make them perfect wading birds who can walk through deeper water wetlands. Their toes make them specialized to walk efficiently through mud. Whooping Cranes and Sandhill Cranes, however, are bound to either flying or walking on the ground – they never perch in trees. We can see that in their feet because their back toe is not long enough to allow them to perch in a tree!

Whooping Crane Feathers: Photo by Hillary Thompson
Whooping Cranes have all white body feathers, and the majority of their wings are white except for their black primary feathers. Black primary feathers are not only a great way to identify the Whooping Crane in flight, but they also have a purpose! Black feathers have more melanin in them, and melanin is more rigid and increases the strength of these primary feathers at their wing tips. These feathers need to be strong because they undergo the most wear and tear in flight.

Whooping Crane Anatomy: Photo by Ted Thousand
Whooping Cranes stand at 5 feet tall, weigh 15-17 pounds, and have a 7–8-foot wingspan. They have long black legs with 4 toes and an all-white body with black wing tips. They have a featherless red crown on top of their head, a black mustache, a yellow eye, and a gray beak that is more yellow near the base. These are they key characteristics used to identify Whooping Cranes.

Whooping Crane Crown: Photo by Ted Thousand
Whooping Cranes are easily distinguished by their red crown. Their red crown however is not made of red feathers but is actually a vascularized bare patch on top of their head. Because it is vascularized it will expand when blood rushes to it which is usually when the bird is feeling upset or threatened. This crown expansion creates a larger red spot on top of their head that says to other birds, animals, or people who are acting as the threat to "STOP".

Whooping Crane Flight: Photo by Mike Endres
Whooping Cranes fly with their neck and their legs outstretched. In flight you can see their large white body and black wing tips. In this photo you can see the bird in the lead is an adult while the bird trailing is a juvenile because it still has some cinnamon coloring on its head.

Whooping Crane Behaviors

Unison Call
Whooping Cranes have many behaviors and one of the most notable is the unison call. Unison calls are used to strengthen pair bonds and proclaim territoriality. Bonded pairs will perform unison calls year-round, but they are most common during the breeding and nesting period.

Whooping Crane Dance: Photo by Jeff West

Whooping Cranes, and all other crane species, also dance to strengthen the bond with their mate. They will start a dance by bobbing their heads and popping their wings out. They will also throw twigs and grass and leap and turn in the air. Most dances end with a unison call.

Butterfly Threat

Whooping Cranes have many forms of threats that say they are upset. This threat here is a butterfly threat. If you see a Whooping Crane with their head up and their wings back like this, it means STEP BACK!

WHOOPING CRANE AND SANDHILL CRANE BIOLOGY

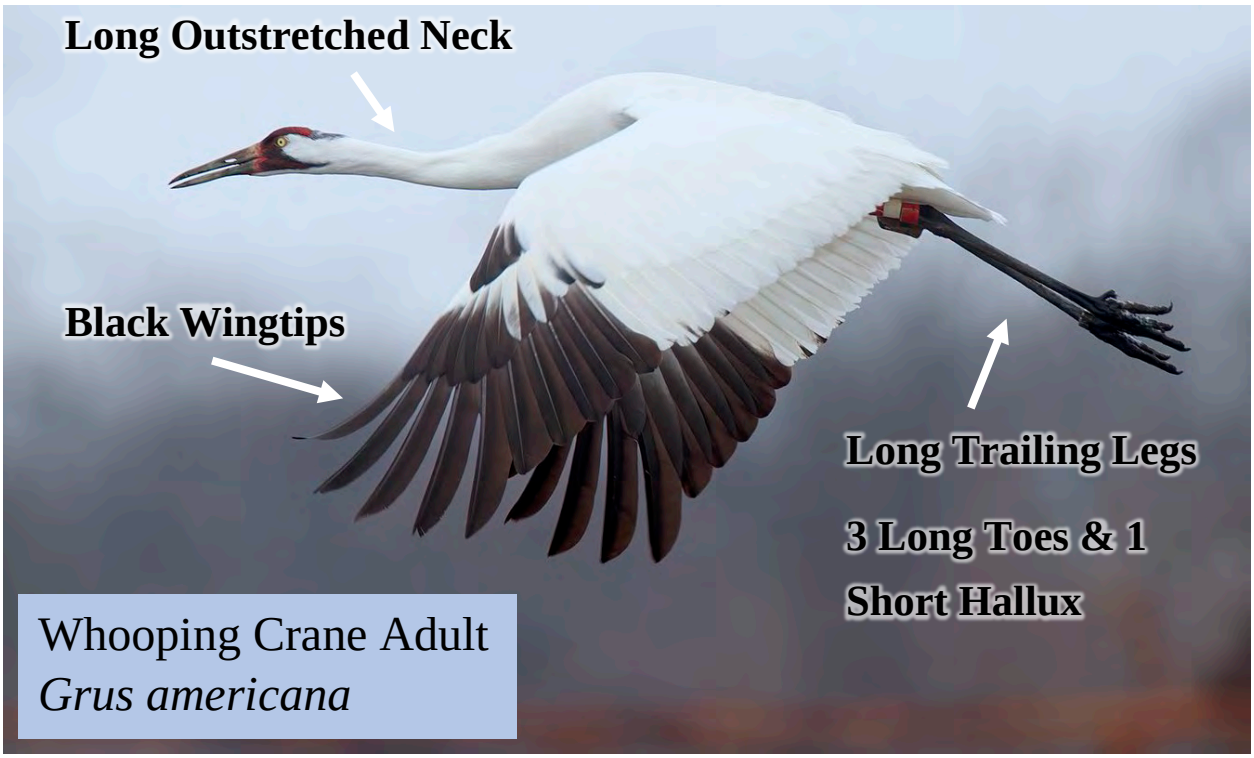
Crane Classification

As members of the Class Aves, all birds share similar characteristics, including feathers, bipedalism, and a high metabolism. However, based on differences in their morphology, behavior, or genetics, they are placed in different orders, families, genera, and species categories. These distinctions illustrate how closely related a group of birds are to one another.

Following is a brief outline of the taxonomic relationships between cranes and other similar wading birds, such as herons, flamingos, and storks. Note that although cranes and other wading birds are similar in appearance, they are classified in different orders and families – and thus are not closely related. The taxonomic classification for the crane family is highlighted in bold type.

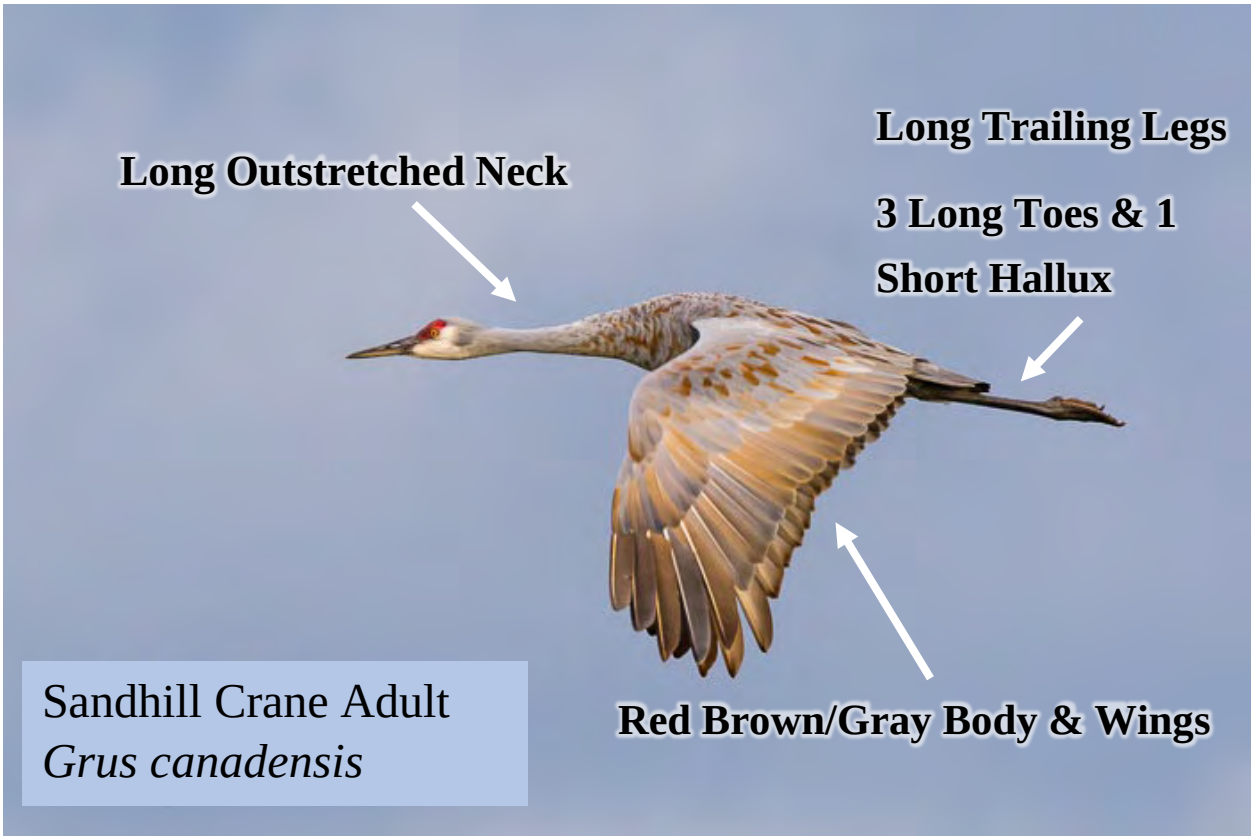
Class Aves
- Order Ciconiiformes
  - Family Ardeidae – herons, egrets, and bitterns
  - Family Threskiornithidae – ibis and spoonbills
  - Family Ciconiidae – storks
- Order Phoenicopteriformes
  - Family Phoenicopteridae – flamingos
- **Order Gruiformes**
  - Family Rallidae – rails, coots, and gallinules
  - Family Aramidae – limpkins
  - **Family Gruidae – cranes**
    - **Genus Anthropoides**
      - Blue Crane
      - Demoiselle Crane
    - **Genus Balearica**
      - Grey Crowned Crane
      - Black Crowned Crane
    - **Genus Bugeranus**
      - Wattled Crane
    - **Genus Leucogeranus**
      - Siberian Crane
    - **Genus Grus**
      - Black-necked Crane
      - Brolga
      - Eurasian Crane
      - Hooded Crane
      - Red-crowned Crane
      - **Sandhill Crane (*Grus canadensis*)**
      - White-naped Crane
      - **Whooping Crane (*Grus americana*)**
      - Sarus Crane

Whooping Crane and Sandhill Crane Identification


Long Outstretched Neck
Black Wingtips
Long Trailing Legs
3 Long Toes & 1 Short Hallux
Whooping Crane Adult
Grus americana


Same Adult Feature
Cinnamon on Head and Wings
Whooping Crane Juvenile
Grus americana


Pink Beak
Whooping Crane Chick
Grus americana
Buffy Brown Body
Covered in Down
Feathers
Gray Worm-like
Legs & Toes


Long Outstretched Neck
Long Trailing Legs
3 Long Toes & 1
Short Hallux
Red Brown/Gray Body & Wings
Sandhill Crane Adult
Grus canadensis

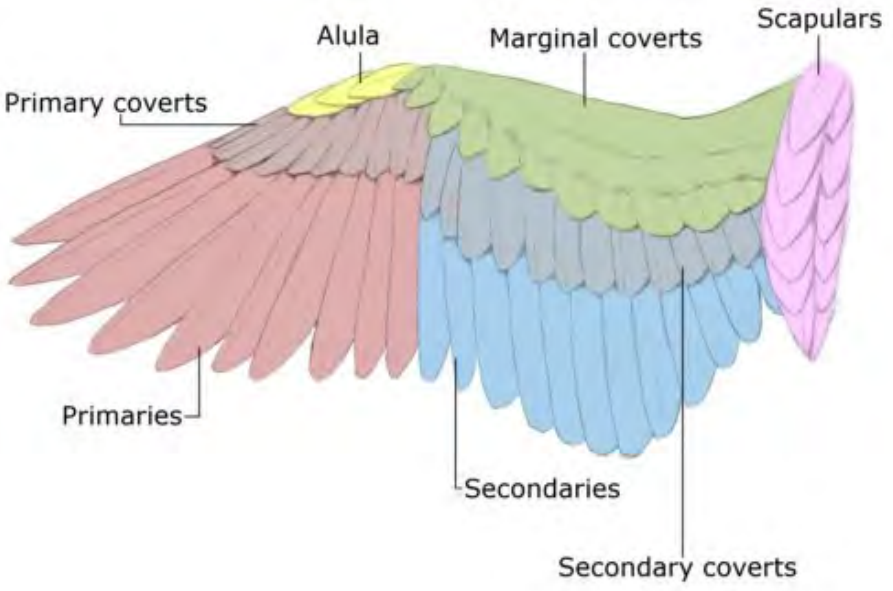
Metrics

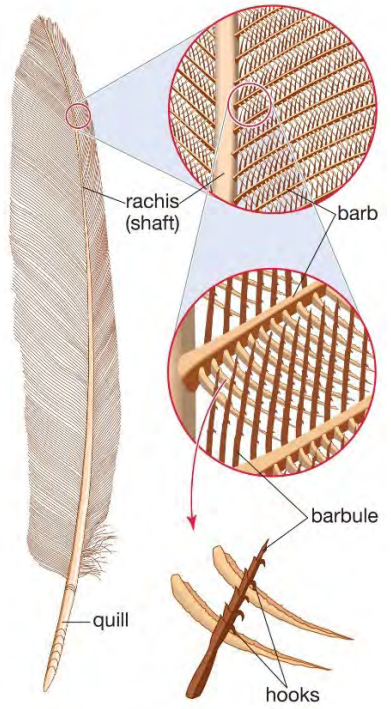
	Whooping Crane	Sandhill Crane
Height	5 ft	4 ft
Weight	15-17 lbs	6.5-14 lbs
Wingspan	7-8 ft	6 ft
Lifespan	22-25 years	20 years

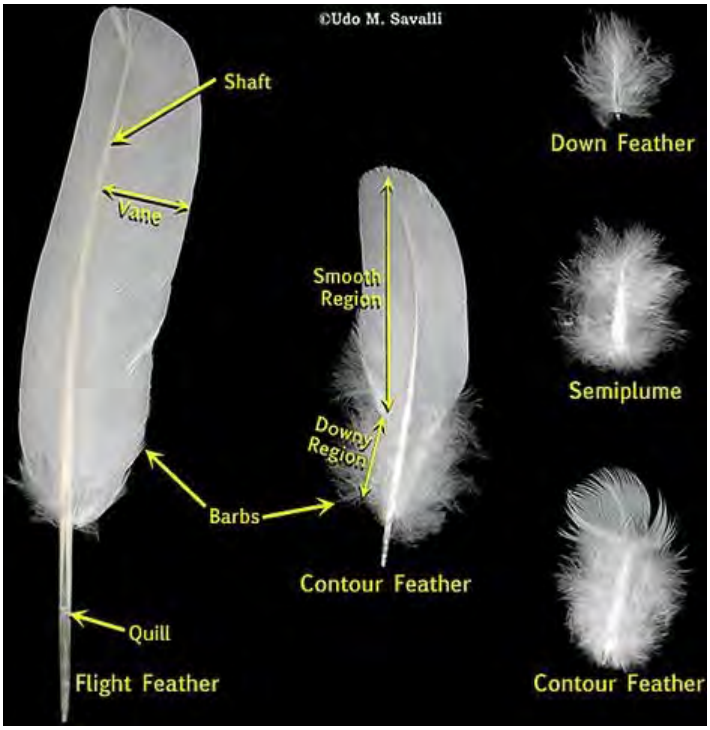
Male vs Female

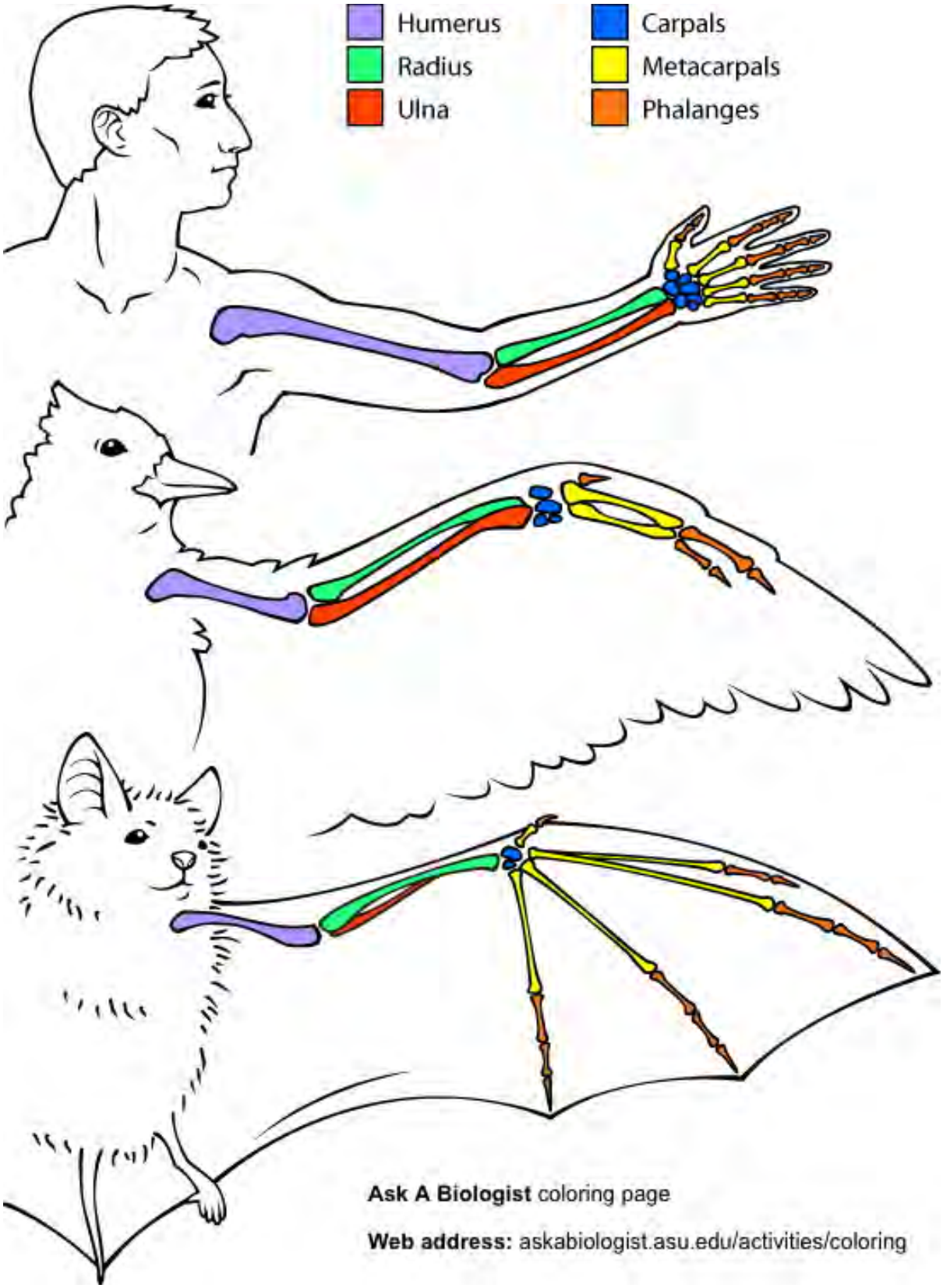
Cranes are sexually monomorphic, meaning males and females have the same plumage patterns and can be impossible the distinguish between one another. A moderate weight difference is noted between males and females, and males can weigh ~2lbs more than females. Despite being sexually monomorphic, their guard call vocalization is sexually distinct with up to a 98.8% accuracy. Additionally, both the vocalization and the visual components of a crane's unison call are sexually distinct.

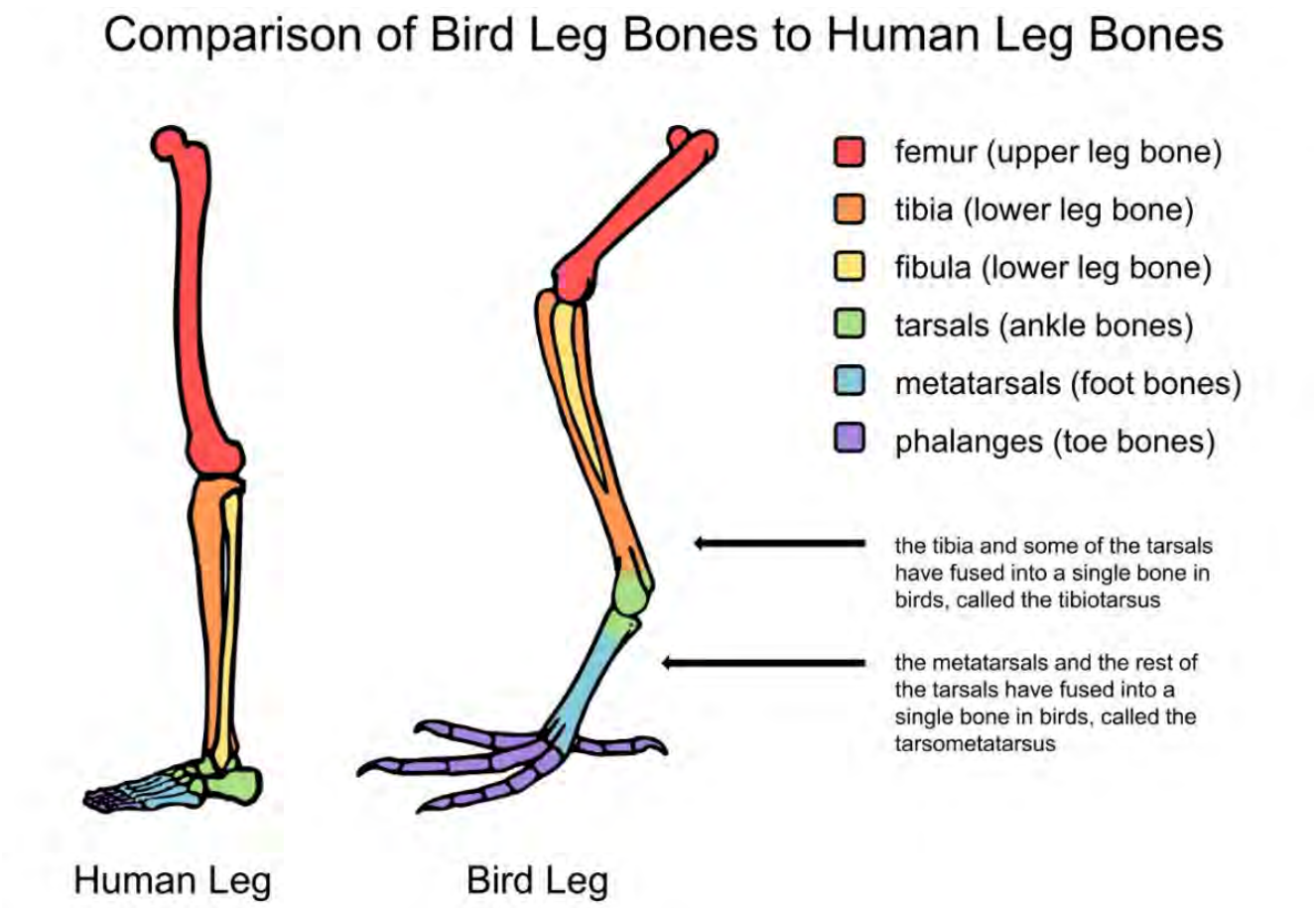
Crane Anatomy

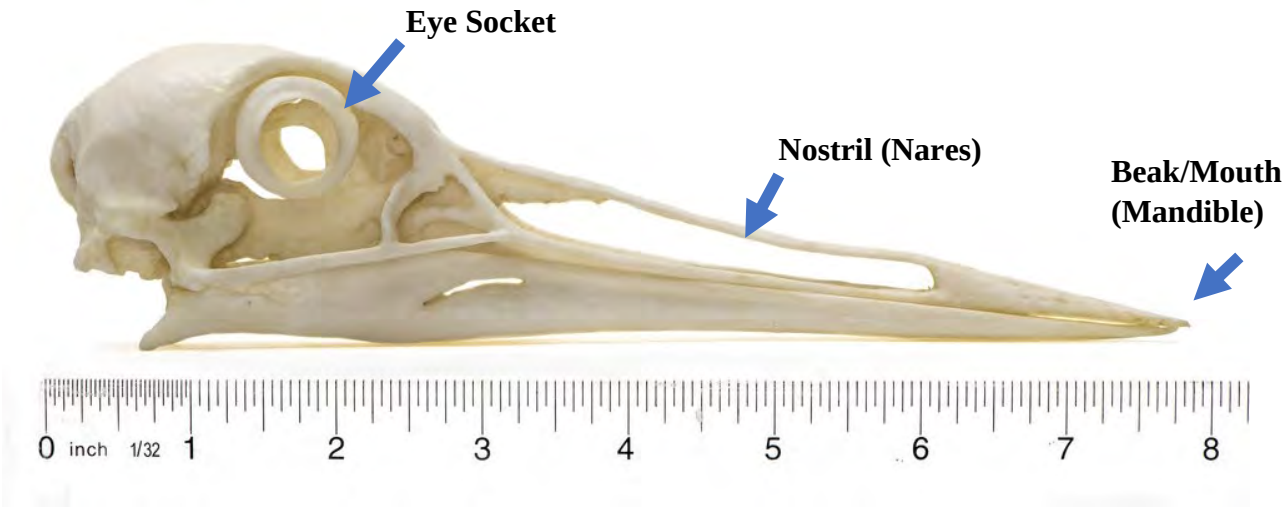







Humerus
Radius
Ulna
Carpals
Metacarpals
Phalanges
Ask A Biologist coloring page
Web address: askabiologist.asu.edu/activities/coloring


Comparison of Bird Leg Bones to Human Leg Bones
femur (upper leg bone)
tibia (lower leg bone)
fibula (lower leg bone)
tarsals (ankle bones)
metatarsals (foot bones)
phalanges (toe bones)
the tibia and some of the tarsals have fused into a single bone in birds, called the tibiotarsus
the metatarsals and the rest of the tarsals have fused into a single bone in birds, called the tarsometatarsus
Human Leg
Bird Leg

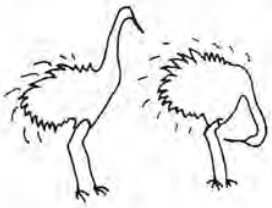

Eye Socket
Nostril (Nares)
Beak/Mouth (Mandible)
0 inch 1/32 1 2 3 4 5 6 7 8

Crane Adaptations

Long Beak	Cranes have very long beaks, compared to other birds. These long beaks are an adaptation to finding food in wetlands. Much of the food that cranes eat, like crabs, insects, and snakes, tend to hide in the soggy wetland soil. Having such long beaks enables cranes to probe the ground and find their food.
Eye Position	Crane's eyes are on the side of their head because they are a prey species, so they need to see their surroundings (owls are predators and their eyes are towards the front). Cranes also have incredible eyesight which allows them to see while they are flying 100s of feet up in the air.
Feathers	-Flight: long and curved to help them stay aloft while flying -Warmth: downy feathers close to their body trap heat and keep them warm (insulate) -Communication who they are: feather colors tell other birds what kind of bird they are, and it helps them to find a mate or find similar species when they create a flock -Camouflage: sometimes you don't want others to know who you are so you want to blend in – SACR paint their feathers brown with mud to help them blend in with the marsh while they are nesting (without the mud they are gray, with the iron rich mud the oxidation turns their feathers red)
Bones	Flight: Cranes have hollow bones which makes them much lighter. A 4' or 5' tall bird only weighs around 15lbs which allows them to fly!
Leg	Cranes need long legs so that they can wade in the water and not get their bodies wet. Long and scaley legs allow their bodies to stay dry and warm above the water level.
Toes	Cranes have long, spread-apart toes. Some other waterbirds, like ducks and geese, have webbed feet that help them swim in the water (like flippers). Cranes, on the other hand, do not swim and therefore do not need to have webbed toes. Having long, spread-apart toes enable cranes to spread out their weight and avoid sinking down into the mucky wetland soil. This is helpful since they spend so much of their time walking around their wetland habitats.
Chicks/Eggs	Camouflage: both crane eggs and crane chicks are a light brown color that enables them to blend in, or camouflage, with their surroundings. Many wetland predators, like coyotes and raccoons, like to eat crane eggs and chicks. These predators could outrun a crane chick (and eggs are immobile), so the chicks and eggs must be able to hide from their predators. Their coloration is an adaptation that enables them to survive until they can learn to fly.

Crane Behaviors

Red patch threats are common, low-intensity threats. The crane is essentially saying "I don't want you here, but I'm probably not going to do anything about it." Red-crowned cranes often turn around with their back facing a tour group and tip their heads up displaying the red patch.



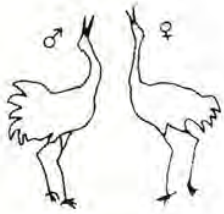
Ruffle threats are also commonly seen threat displays. The sandhill cranes often ruffle threat. The threat begins with the bird ruffling its wings back and forth and often ends with a bow and sometimes with a growl--depending on the bird's level of aggression.

Flap threats take two forms: in the first, the bird drops its head down and violently flaps its wings. In the second, the crane leaves its head up, opens its wings, holds the pose for a second, and then finishes with one or more violent flaps.

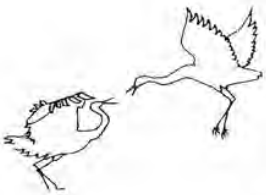
Parade walk threats are identified by the stiff gait that resembles a marching soldier. Generally cranes close the toes as they lift them off the ground and then splay them open when setting the foot down. In a parade walk, however, the bird keeps its toes stiffly splayed open during the entire stride.

Crouch threats are serious business! This threat is generally regarded as the most serious threat available to cranes short of an outright attack. While it looks like a vulnerable position, the bird can leap to attack with very little additional warning. The threat begins with the bird sinking to the ground and holding the position shown above for 3-20 seconds. The threat often ends in an attack.

Arch threats are often performed by red-crowned cranes. The bird's wings are held open to show the bird's full size and to intimidate opponents--the head is held upwards. The crane often walks slowly in circles to make sure their opponent hasn't missed seeing them from all angles.

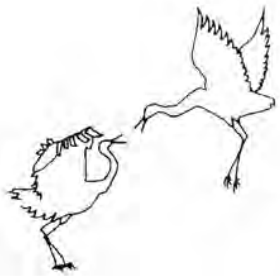


Unison calls are used to reinforce pair bonds and as a territorial call to warn other cranes away. The birds usually stand within a few feet of each other and call together as a duet. Usually only mated pairs make a unison call. Unison calls of the sandhill crane may be heard a mile away on a calm morning.



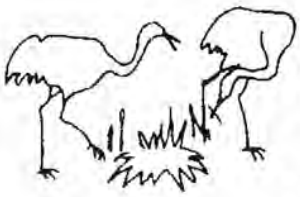
Distraction displays are sometimes mixed in with threat behaviors. This threat is most often seen when the adults are defending chicks or eggs. Some cranes may feign a broken wing to lead predators away from helpless young. A related threat is the **nest defense display** in which the adults stand stiffly upright and fan their wings open to look as large and as intimidating as possible to predators. You are not likely to see a distraction display at ICF, but if an aviculturist enters a pen to take an egg, you may see a nest defense display.

Guard calls are single, loud calls used to warn other cranes, particularly mates and chicks, of danger. Mates may answer, but the call isn't ongoing like a unison call.



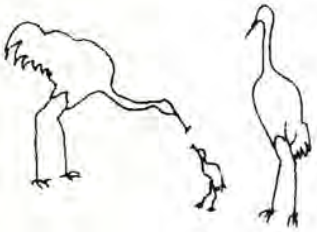
Dancing is often thought of as the "mating" dance, but it is used for other things than just reinforcing pair bonds. For instance, crane chicks may dance to develop better coordination. Another reason why cranes dance is to help relieve stress by exercising!

Precopulatory posture (left) is a prelude to copulation (right). During precopulation, the female opens her wings slightly and purrs loudly. The male approaches from behind and flies onto his mate's back where he balances while they press their cloacas together. The male then dismounts over her head. Copulation is followed by a unison call.



Nest building is performed by both adults. Most of the vegetation needed is collected in the immediate vicinity of the nest. From the air these nests look like they have a moat around them because so many of the plants have been pulled up to make the nest.

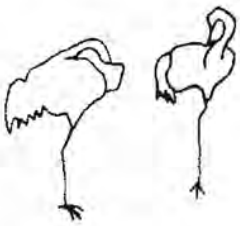
Incubation duties are shared by both birds, although the female may do most of the incubation at night as the male stands guard.



Feeding the chick is done by both adults, but often it is the male that feeds the chick first. Insects and their larvae are favorite foods of the chicks and the adults spend much of their day finding food for themselves and the chicks. Chicks often beg by "bill touching."

Brooding is important, especially for the chicks first few days after hatching since it can't regulate its own body heat and can chill easily. Chicks are brooded during the nights when the temperatures fall, during the day when the chick becomes cold, or when it rains.

Probing in upland fields or in wetlands is one way cranes find roots, tubers, and animal life below the surface of the ground. Cranes often tear up large parts of their pens at ICF by probing. In Vietnam and Australia on the wintering areas of the sarus crane and brolga respectively, large areas are literally plowed by these birds excavating the soil looking for the tubers.



Roosting is usually done in water deep enough to cover the toes of the birds, but generally not in water deeper than 10-12 inches. Cranes usually roost standing on one foot with their head laying along their backs or tucked under the trailing edge of a wing. At ICF you may see roosting birds, particularly in the summer after they have acclimated to having a lot of people around.

Preflight posture alerts other nearby cranes that the performer is considering flying. The crane leans forward and strongly arches its neck. From this posture it can smoothly move into a run prior to lifting off. Cranes may perform this behavior to determine if other cranes in the flock would like to fly, or to prevent midair collisions on take off by warning other cranes of their departure.

Crane Habitats

All Cranes are wetland dependent, and cranes rely on wetlands to provide food, shelter, water, nesting habitat, and protection from predators. Water is incredibly important for nesting and roosting cranes because predators who move through water make more noise and alert cranes of their presence so they can escape to safety quicker. For that reason, cranes may use alternative habitats during the day to forage for food (i.e. prairies, ag fields), but they always return to wetlands or river banks to roost in water overnight.

Cranes nest over water for the same reason. Crane nests are large mounds of vegetation, primarily dried/dead cattail and bulrush, that look similar to muskrat lodges. These large mounds of vegetation stay above the water level to keep the nest and the eggs and chicks dry while providing that additional level of predator protection. Crane eggs and chicks are also a buffy brown color to blend in with the nest which allows helps to keep their offspring camouflaged and safe from predators.

Crane Diets

Cranes are omnivores and their diet primarily consists of plants and animals that can be found in wetlands. These include crayfish, fish, frogs, snakes, small birds, wolfberries, tubers and roots, insects, and crabs. Whooping Cranes wintering along the Texas coast rely very heavily on blue crabs and can even eat as many as 80 blue crabs in one day! They rely on blue crabs so much so that blue crab abundance can even be linked with wintering ground mortality for Whooping Cranes. Blue crab abundance can be determined by the salinity of the estuaries that Whooping Cranes feed in, and a higher salinity results in less blue crab abundance. In the winter and during migration, cranes will also use agricultural fields and feed on waste grains.

THREATS TO WHOOPING CRANES

Historically Whooping Cranes were threatened by unregulated hunting following European expansion, egg collecting, the millinery trade (feather trade to adorn women's hats), and massive habitat loss following the Homestead Act of the 1860's which led to a rapid expansion westward to convert wetlands and prairies to agricultural fields. It was these threats that led the historic Whooping Crane populations to drop from over 10,000 individuals to just about 20 birds in the 1940's. Currently, Whooping Cranes are threatened by the loss and deterioration of critical wetland habitats – including reduced fresh water on wintering grounds in Texas, sea-level rise, low genetic diversity, power line collisions, predation, disturbance at nest sites, and illegal shootings (i.e., poaching).

THREATS TO SANDHILL CRANES

Sandhill Cranes are an example of a conservation success story. In the 1940's Sandhill Cranes were removed from the landscape in large numbers due to unregulated hunting and habitat loss. There loss was so substantial that Aldo Leopold, a Midwest naturalist, thought Sandhill Cranes would be lost from Wisconsin forever. Today, the Sandhill Crane species has grown to outstanding numbers, but not every population is stable (i.e. Mississippi Sandhill, Cuban Sandhill) and they are still threatened by habitat loss and conflicts with agriculture.

WHOOPING CRANE HISTORY

1200

- Whooping Cranes historically lived along the Texas coast in North America. Through archeological digs we have learned that Whooping cranes were culturally significant. The findings that have led to this conclusion include 11 whistles carved from ulnas (wing bones) of Whooping Cranes found in the graves of important members of indigenous communities in Galveston, TX. It is believed that the whistles may have made sounds inspired by these birds because people were touched by the beauty and grace of this ancient species.
- Whooping Cranes are believed to have existed for roughly 5 million years and their skeletons today remain identical to the birds we would have seen 5 million years ago.

1600

- Pre-European expansion, the Whooping Crane's historical range was massive. It ranged from the arctic coast in the north to Central Mexico in the south. From east to west it ranged from New Jersey to California. No one knows for sure how many Whooping Cranes could have been found in the prairies and wetlands of North America, but rough estimates suggest around 10,000 wild Whooping Cranes.

1790

- European settlers moved into North America, an area which was lush with resources, and game laws were mostly ignored and seldom enforced. This led to unrestrained hunting and destruction of wildlife habitats that grew into the 1800's. This is what led the Passenger Pigeon to go extinct in 1914 and is a primary cause for leading the Whooping Crane on its descent towards the brink of extinction.

1860

- The Homestead Act of the 1860's passes and encourages settlers to move west and convert land into agricultural fields. This leads to massive destruction of wetland and prairie habitats that Whooping Cranes relied on into the 1900's. It is through this massive habitat loss and unrestrained hunting that the Whooping Crane starts to become scarce on the landscape and the once 10,000 bird population has dropped to less than 2,000 wild birds. Unfortunately, now that the Whooping Crane is scarce on the landscape its value has increased and there is further unrestrained hunting and egg collecting, which is highly detrimental for a long-lived slow reproducing species like the Whooping Crane. It is estimated that habitat loss, hunting, and egg collecting were responsible for 90% of the decline in Whooping Cranes in the last 3 decades of the 19th century.

1894

- Ornithologist Rudolf Anderson sees the last believed pair of nesting Whooping Cranes as a marsh in Northern Iowa.

1896

- Hats with big feathers were all the rage for high society women. The most attractive feathers were those of colorful birds or large white birds. The feather trade, also called the millinery trade killed ~5 million birds/year and drove the Carolina Parakeet to extinction and almost drove the Snowy Egret to extinction. It wasn't until high society women in Boston noticed the issue and formed the Massachusetts Audubon Society which resulted in a ban on wild bird feathers.

1913

- The Weeks-McLean Act was passed, and it is the first federal law to protect birds. This law made it illegal to hunt birds in the spring, sell migratory birds (dead or alive), or use their feathers in women's fashion.

1918

- The Migratory Bird Treaty Act is passed in the United States and Canada and makes it illegal to hunt, capture, kill, or sell birds without a permit from the USFWS. This included the take of dead birds and bird parts, feathers, eggs, and nests. The migratory bird treaty act today protects more than 1000 species, including the Sandhill Crane and the Whooping Crane. In order to take feathers, birds, and parts of birds, people can apply for a permit (ex: falconry, science, religious purposes, hazardous animals)

1922

- The last Whooping Crane chick is hatched in Saskatchewan.

1929

- The last Whooping Crane nest is recorded in Saskatchewan.

1934

- President Herbert Hoover creates the Duck Stamp, a federal art competition to design a waterfowl themed stamp that is sold to hunt on federal lands and the proceeds go to protect and conserve wetland habitats. This program still exists today and has raised over $850 million and protected more than 6.5 million acres of wildlife habitat.

1938

- Aransas Refuge, a coastal marsh that provides habitat for wintering Whooping Cranes in Texas, was purchased in 1937 and they began their first count of Whooping Cranes. It is estimated there were only 30 wild Whooping Cranes at this time, and in their first count they only spotted 18 cranes. 75 years earlier there would have been over 1400 wild Whooping Cranes in this marsh.

1940

- A hurricane strikes in Louisiana and hits the historic non-migratory population. At this time there are around 13 birds but following the hurricane only 6 return. Of the 7 that were lost, 6 were presumed to have been shot.

1946

- The Whooping Crane population has decreased to such low numbers that scientists no longer know where they are breeding. In 1946 the National Audubon Society set out to find where Whooping Cranes nested. These summering grounds are not found until 1954 when Canadian biologists happened upon Whooping Cranes tending to a nest in Wood Buffalo National Park while managing a wildfire. Once biologists knew where these birds were nesting they could begin to devise a long term plan.

1948

- Whooping Crane populations are now dangerously low. Predictions suggest there are around 20 birds remaining in the wild and 2 Louisiana birds in captivity who have sustained injuries. It is at this time that captive breeding programs began in the United States, starting with the 2 Louisiana birds at the Audubon Zoo in New Orleans, LA. These two birds managed to hatch and raise chicks, but their chicks failed to ever reproduce.

1950

- Only 1 bird remained in the Louisiana non-migratory flock. It was captured and transported to the Aransas refuge in Texas to join the historic flock. However, this bird was found dead 1 year later on the refuge and the Louisiana populations genetics were lost forever.

1964

- The Wilderness Act, a national wilderness preservation system, is passed and creates the highest level of protection from human impacts for wild areas. By 2013, more than 100 acres of land will receive this protection.

1966

- The National Wildlife Refuge system is created and provides federal protection for wildlife habitats, including Aransas Wildlife Refuge where Whooping Cranes spend their winters. At this time there are believed to be 43 wild Whooping Cranes and 7 captive Whooping Cranes.

1967

- Patuxent Wildlife Research Center begins breeding birds using eggs form wild nests. For nests that have 2 eggs they leave 1 in the wild and bring 1 back to Patuxent, because most wild cranes only raise 1 chick at a time. From 1967-1996 they collected 441 eggs. Of

these eggs, 225 hatched birds built the captive flock, and 216 birds were reintroduced to North America.

- One issue Patuxent initially faced was that the chicks were not growing up to want to breed with other birds. This is because they were raised by humans and they imprinted on them, meaning they thought this person who raised me is who I am, so they did not want to associate with other birds. This is incredibly dangerous for wild birds and is unhelpful when you need to breed birds to save them from extinction. It took 20 years for Patuxent to find a reliable solution to the issue of imprinting.

1970

- Earth Day is founded by Senator Gaylord Nelson of Wisconsin and leads to a greater public appreciation and celebration of natural spaces.

1972

- The Clean Water Act is passed after Ohio's Cuyahoga River catches fire 13 times. Following the passing of the Clean Water Act is the establishment of the Environmental Protection Agency (EPA). Both have led to significant protections and restorations of aquatic habitats, such as the wetlands Whooping Cranes rely on.

1973

- The Endangered Species Act is passed by President Richard Nixon. This act is still the most comprehensive legislation for the preservation of endangered species ever enacted by any nation. It prohibits the take and trade of listed animals and animal parts (feathers, eggs, etc.). In 1973 the Whooping Crane was grandfathered into the Endangered Species Act to be listed as endangered when there were only 49 wild birds, and today while there are over 650 wild birds the Whooping Crane is still endangered. The goal for crane conservation organizations is to have the Whooping Crane slowly down listed as it becomes self-sustaining, or no longer relies on humans releasing birds into their populations to help them grow. As of 2022 the Whooping Crane has not reached that threshold and being a long lived and slow to reproduce species it will take some more time for it to reach that stage.

1975

- The Rocky Mountain Experimental Flock is created. In this experimental flock, fertile Whooping Crane eggs from Wood Buffalo National Park were placed in Sandhill Crane nests in Gray's Lake National Wildlife refuge in Idaho. The thought here was that the wild birds would raise them and teach them to migrate to Bosque del Apache to create a new migratory population of Whooping Cranes. When they chose Sandhill Cranes as incubating surrogates, they thought a crane is a crane and there should be no issue with imprinting, but they were wrong. When the Whooping Cranes hatched from these eggs, they imprinted on Sandhill Cranes and did not associate with or breed with other Whooping Cranes. As a result, no Whooping Cranes ever hatched from this population.

The program was discontinued in 1989 and the last Whooping Crane hatched by a Sandhill Crane died in 2002.

1976

- George Archibald, co-founder of the International Crane Foundation, met Tex, a Whooping Crane at Patuxent who was imprinted on humans. Tex had valuable genetics and it was necessary that she started breeding. George helped her start breeding by developing a pair bond with her and dancing with her which helped her body and hormones to prepare for breeding. She was then receptive to artificial insemination and 7 years later produced a fertile egg. This egg hatched a chick named Gee-Whiz who went on to father 20+ chicks, most of which were reintroduced into the wild. Tex passed away in 1982 and Gee-Whiz recently passed away at the International Crane Foundation in Feb of 2021 at 38 years old.

1980

- The Whooping Crane Recovery Team is formed, and their main goal is to conserve the Whooping Cranes alive today and establish new populations as safeguards. At this time there are 90 wild Whooping Cranes, 26 captive Whooping Cranes, and 20 released Whooping Cranes. The team's goal is to finally have self-sustaining populations of Whooping Cranes.

1985

- Costume rearing is introduced for captive populations to answer the issue with imprinting. Before costume rearing, chicks imprinted on the humans or other birds who raised them and did not want to mate with other Whooping Cranes. Should it continue this way, it would doom the reintroduction efforts. Costume rearing was introduced by having crane keepers or conservation staff raise hatched cranes while wearing a large white costume that covered their body and interacting with the chicks using carved puppet heads that looked like Whooping Cranes. While in these costumes the crane keepers did not speak and used a small tape recorder to play brooding noises that wild Whooping Crane parents would make when communicating with their chicks.

1986

- The United States joined the Ramsar convention in 1986. Wetlands cover 6% of the earth's surface and are valuable for providing suitable conditions for many wild plants and animals, filter polluted surface waters, and reduce flooding. However, many wetlands in the United States and worldwide have been drained for agriculture and because of this the International Ramsar Convention was created as a response. This convention works to protect 2,000+ wetlands around the world in 168+ countries. This global wetland protection is important not just for Whooping Cranes but is also important for all 15 species of cranes worldwide who depend on wetlands for their survival.

1989

- The Patuxent flock in split in half and half of their captive birds are sent to Baraboo, WI to begin breeding. By 1991 the first captive birds began producing eggs, and at this time there were 229 Whooping Cranes of which 57 were captive Whooping Cranes.

1989

- The Wetland Conservation Act is passed to conserve North America's wetlands. This law created 2000+ projects to conserve wetlands and impacted 25 million+ acres of wetlands.

1993

- A non-migratory flock of wild Whooping Cranes is reintroduced to Florida at the Kissimmee Prairie, where the habitat should be able to support them year-round. In 2000 the first wild chick was hatched, but unfortunately this population faced too many challenges from habitat loss, drought, and bobcat predation. In 2008 Florida Whooping Crane reintroductions were stopped and today a small population remains in the area.

1999

- The Whooping Crane Eastern Partnership is formed and plans to create a migratory eastern United States flock. The plan for this flock is to raise chicks in captivity and release them in to the wild while teaching them to migrate.

2000

- The first wild Whooping Crane to hatch in 60 years hatched in Florida!

2001

- The released eastern migratory population (EMP) begins its first ultra-light led migration from Wisconsin to Florida, called "Operation Migration". The ultra-light is a small light-weight plane, and it was flown by a pilot wearing the Whooping Crane costume rearing outfit while the plane broadcasted an adult Whooping Crane's brooding calls. It was important here that the chick's released and taught this migration route were imprinted on the costume and socialized as a flock so that they would follow this plane. The first ultra-light led migration for Whooping Cranes was 1,200 miles and took months to complete! At night the chicks stayed in a pen built around them, and the pilot and the chicks did not fly in bad weather conditions. At this time there were 475 Whooping Cranes, 117 of which lived in captivity. Operation Migration was a great success and it ended in 2016.

2005

- The International Crane Foundation and USFWS began to release birds using direct autumn release (DAR). DAR Chicks were reared at the International Crane Foundation and introduced into "wild" Whooping Crane populations all at once. It was hoped that if the captive cranes were raised together, they would form a group and social structure and when released with wild cranes, which had learned the migration route in previous years

from the ultralight project, would teach the route to the new group. This technique of a mass release of captive chicks into the wild raised in captivity was last practiced in 2015.

2006

- The first 2 Whooping Crane chicks hatched in the wild at Necedah National Wildlife Refuge. This is the first time in over 100 years that a Whooping Crane has hatched in the Midwest. In the fall of 2006, 1 of these chicks fledged and followed its parents on migration to Florida, which was the first time this happened since the late 1800's!

2009

- In December of 2009, a female Whooping Crane who was reintroduced to the EMP and had successfully raised a wild hatched chick with her mate, was found dead by gunshot wound in Vermillion County, Indiana. By 2009, more than 30 other wild and reintroduced Whooping Cranes had been shot since 1989. These mortalities are the greatest threats to recovery efforts for the Whooping Crane and the International Crane Foundation is working hard to make sure vandals are held responsible and punished to the fullest extent of the law.

2011

- The reintroduction program for the Louisiana non-migratory population was started at White Lake Wetlands Conservation Area.

2015

- Direct Autumn Release (DAR) paused. Parent-rearing preferred.

2016

- The last ultra-light led migration was done.

2020-2022

- The covid-19 pandemic limited the costume-rearing and release efforts that could be done at the International Crane Foundation and other crane-rearing facilities. As a result, the wild populations in the past years of the pandemic have seen less fledglings and the population numbers have not risen as expected. Following the pandemic, costume-rearing and reintroduction efforts will commence at their usual amount. At this time, there are over 650 wild Whooping Cranes among 2 non-migratory and 2 migratory flocks. The Eastern Migratory Population (EMP) no longer migrates as far south as Florida to winter and now winters mostly in Indiana at Jasper-Pulaski FWA and Goose Pond FWA, Tennessee at Hiwassee Refuge, and Alabama at Wheeler NWR. The Whooping Crane is still listed as endangered.

WHOOPING CRANE POPULATIONS

Historically there was 1 population of Whooping Cranes in the United States. This historic population spanned from the arctic (breeding) to central Mexico and the coastal Gulf of Mexico (wintering). Pre-European expansion there were an estimated 10,000 Whooping Cranes in the prairies and wetlands of North America.

There are currently 4 populations of Whooping Cranes in North America. The first population is the historic population which consists of a single flyway of birds who spend their summer in Wood Buffalo National Park in Alberta, Canada and their winters in Aransas National Wildlife Refuge in Port Aransas, Texas. The second population which was reintroduced in the 1990's is the Florida non-migratory population. This population is located in Kissimmee Prairie and reintroductions to this population were halted in 2008 following high mortality rates due to drought, habitat loss, and bobcat predation. The third population which was reintroduced in 2001

is the Eastern Migratory Population (EMP). This population breeds in Wisconsin, primarily at Necedah National Wildlife Refuge, Horicon National Wildlife Refuge, and White River Marsh. This population was taught its migration route from an ultralight aircraft which led fledglings from Wisconsin to Florida. Today, the population no longer winters as far south as Florida, and most birds winter at Wheeler National Wildlife Refuge in Alabama, Hiwassee Wildlife Refuge in Tennessee, and Goose Pond and Jasper-Pulaski Fish and Wildlife Areas in Indiana. The fourth, and final, population is the Louisiana Non-migratory Population (LNMP). This population was released at White Lake Wetlands Conservation Area in Louisiana in 2011.

Mirande CM, Harris JT, editors. 2019. Crane Conservation Strategy. Baraboo, Wisconsin, USA: International Crane Foundation.

SANDHILL CRANE POPULATIONS

The Sandhill Crane is much more common than the Whooping Crane, with over 827,000 individuals across North America in 5 subspecies. Three of the five subspecies are non-migratory and include the Cuban Sandhill Crane (Cuba, endangered), Mississippi Sandhill Crane (Mississippi Sandhill Crane National Wildlife Refuge, endangered), and Florida Sandhill Crane (Florida). The other 2 subspecies, the Greater Sandhill Crane and the Lesser Sandhill Crane, are migratory and can be found throughout the majority of North America.

Mirande CM, Harris JT, editors. 2019. Crane Conservation Strategy. Baraboo, Wisconsin, USA: International Crane Foundation.

WHOOPING CRANE REINTRODUCTION

Reproduction in Captivity

Captive breeding is an essential part of saving an endangered species, like the Whooping Crane, from extinction.

Step 1: Matchmaking
Whooping Crane pairs are selected based on their genetics, behavior, age, and rearing history. When a match is created, our staff begins to socialize the two birds, a process which can take a few months to a few years! It is important the birds form a strong bond, because without one a female will not be able to produce eggs. One indication that birds have formed a strong bond is if they unison call together.

Step 2: Eggs!
Whooping Cranes will begin breeding when they are 4-5 years old, and the breeding season begins in mid to late-April and continues through early June. Adult Whooping Cranes are monogamous and will breed with the same partner year after year. They also exhibit high nest site fidelity, meaning they will return to the same spot to nest year after year, too! Whooping Cranes typically have two eggs per clutch, but only raise one chick to fledging. In captivity we have the option of multiple clutching – our staff removes eggs from the nest as they are laid or as a clutch is completed. By removing their eggs, a pair is stimulated to produce another clutch, thereby increasing the number of eggs that our flock produces. As a result, a single female may lay two, four, or even more eggs during a breeding season. Our staff looks at an individual female's age, health and laying history to determine the number of eggs each crane safely can lay.

In captivity, our birds breed through artificial insemination, a technique is used to manage for genetic diversity and to increase egg fertility. For the best genetic diversity, it means a bird may be bred outside of its bonded pair but can still maintain that social bond! Once eggs are laid our staff either allow birds to sit on their eggs or their artificially incubate them. Whooping Crane parents share incubation duties, but the female tends to incubate at night while the male incubates more frequently during the day.

Step 3: Hatching and Rearing
After approximately 29 days, a Whooping Crane egg is ready to hatch. At this point, we place the egg in an incubator so that our staff can closely monitor the hatching process, which takes approximately three days. The first step is for the chick to internally pip or break through the egg's air cell located at the large end of the egg. At this point, the chick can be heard peeping from inside the egg! Next, the chick has to externally pip by breaking through the eggshell. The third step is for the chick to rotate around the large end of the egg, continuing to break open the eggshell and finally pushing its way out of the shell. The result is an exhausted chick that will take its first wobbly steps within hours and will be able to swim within 24 hours. A chick that can open its eyes and ambulate following hatching is called a precocial chick.

Most Whooping Crane chicks hatched at the International Crane Foundation will be **released into the wild**.

Chicks Don't Just Happen

Saving endangered species is hard work! In the early 1940s, the entire population of Whooping Cranes was just 21 birds. Today there are more than 600 Whooping Cranes in the world - in both captive and wild populations. They've come far, but Whooping Cranes still need our help if they're to survive into the future. This is how we produce the eggs that will become the Whooping Cranes released back into the wild.

1. Matchmakers

For the best genetics, we look at a book that tells us the parents, grandparents and great-grandparents of all the Whooping Cranes alive today — just like a family tree.

2. More IS better

Taking away a newly laid egg prompts the female crane to lay another. This way we can get up to 3x's more eggs than she would produce naturally.

3. You light up my life

At 5-7 days, candling shows us if an egg is fertile. If it is, an air sac begins to form for the chick.

4. Babysitters

Red Crowned, Sandhill, Siberian and White-naped Cranes help incubate all the extra Whooping Crane eggs so stronger, healthier chicks develop.

5. Planning a Hatch

Mechanical incubators are used when the chick is very close to hatching.

6. Can you hear me now?

Adult cranes make "contact calls" to the egg early in its development. Chicks in the egg can "peep" a reply at about 26 days old!

7. Almost there...

About day 27, the egg will "pip", or break through the shell. Then it is put into the hatcher to be closely monitored.

To adopt a crane chick visit savingcranes.org

INTERNATIONAL CRANE FOUNDATION

Imprinting

Whooping Cranes, like most ground nesting birds, imprint. Imprinting is a type of rapid learning where an individual determines who or what it is. Chicks imprint on the first object they see or hear after hatching, and in the wild this is usually their parent. With this imprinted knowledge they are able to learn their own identity, mating preference, and even habitat preference. For Whooping Cranes hatched in captivity, imprinting can be a large challenge. If a Whooping Crane chick imprints on a human, they will not want to socialize or breed with other Whooping Cranes. The same is true if a Whooping Crane imprints on another species of crane, like a Sandhill Crane. For an endangered species like the Whooping Crane, imprinting on anything other than another Whooping Crane can be detrimental to a species survival. The International Crane Foundation realized this very early on in their reintroduction process and they knew they needed to get creative. It was through this creative thinking that costume rearing was developed.

Costume Rearing

The International Crane Foundation began using costume rearing in 1985 to raise Whooping Cranes for release while addressing the issue of imprinting that became apparent in past attempts to create wild populations. To do this, the costumes needed to portray the same distinguishing qualities of a Whooping Crane adult including their plumage, vocalizations, and behaviors.

To look like a Whooping Crane the costumes need a completely white body around 5 feet tall, a head with a red crown, yellow eye, black mustache, and long dark beak, white wings with black wingtips, and dark feet. These costumes are worn by biologists and aviculturists to raise Whooping Crane chicks for release. It is also important that biologists sound like Whooping Cranes, so the biologists who wear the costumes do not speak around the chicks and instead they play a tape recorder that broadcasts the brooding call of an adult Whooping Crane. Finally, the biologists who wear these costumes mimic the behaviors of adult Whooping Cranes. These behaviors include looking up when a bird flies over, taking a preflight pose before running and flapping their wing to “take flight”, preening, drinking water, capturing insects to feed to their chicks, and remaining alert while maintaining an upright head and neck and a tucked wing.

While biologists are in these costumes their goal is to teach Whooping Crane chicks how to make good decisions to survive in wild. They teach them to use wetlands, search for roots, tubers, frogs, snakes, insects, and crayfish to eat, be alert when there is a disturbance, and drink from water sources. They also prepare them for living in the wild by feeding them a healthy diet of “crane chow” and giving them exercise so they develop strong breast muscles that can sustain flight. This is important for all released Whooping Crane chicks but is especially important for the Eastern migratory population (EMP) chicks which will begin migrating just a few months after they are capable of flying.

Following costume rearing, Whooping Crane chicks are released into the wild in a variety of ways including through operation migration (2001-2016), direct autumn release (2005-2015), and parent-reared release (2016-present).

Tools of the Trade

One chick to go, please!

This box keeps chicks safe and warm as they make the short trip from the hatchery to the brood box.

Adult role models use their **Red** crowns for a variety of behaviors. Chicks quickly learn that **Red** is an important color.

And **Red** plastic spoons are easy to see for finding food as they develop eye-beak coordination.

Meal worm anyone?

Contact calls are played to get the chick's attention. When they respond they get a treat!

Heat lamps keep chicks warm and realistic brood models help them feel safe.

Home, sweet home.

The expandable sides of the brood box keep chicks in a manageable space that can get larger as the chick grows.

Tiny leg bands identify chicks as soon as they hatch. *But they grow fast!* Bands must be changed every 10-14 days!

Chicks are weighed regularly to make sure they are gaining enough weight - *but not too much!*

Marbles?!

Bright colors make learning to drink interesting and fun.

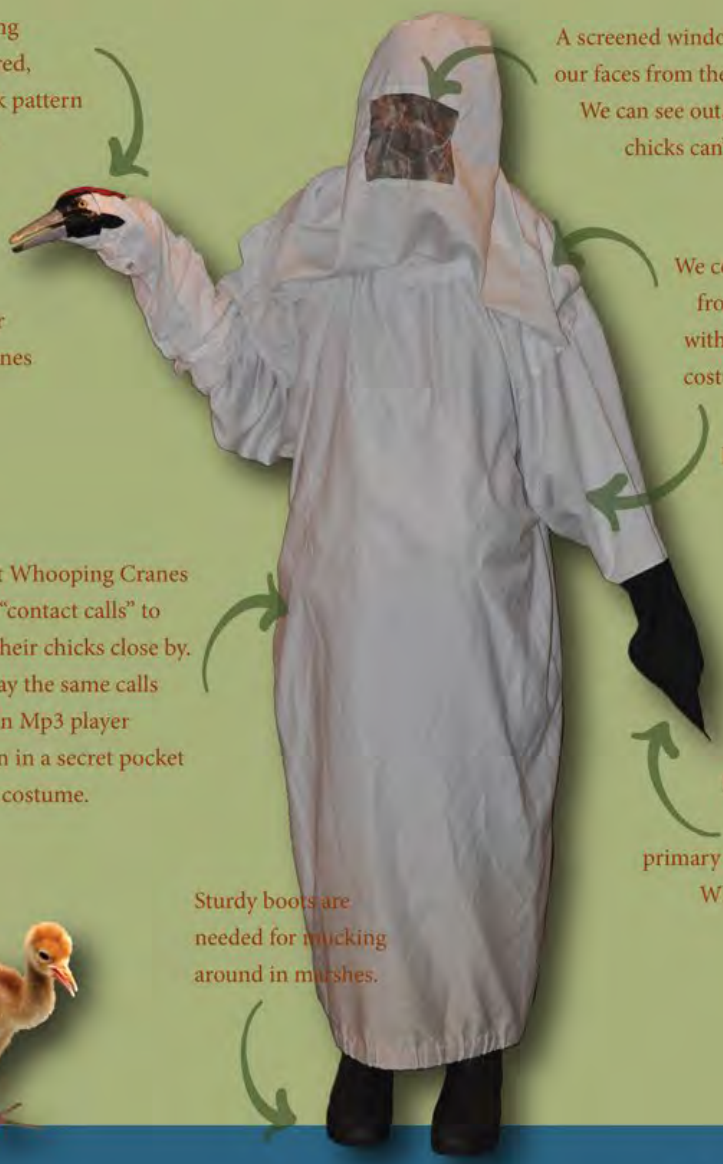
And they raise the water level so tiny chicks can drink without getting hurt.

To learn more about our work visit savingcranes.org

INTERNATIONAL CRANE FOUNDATION

Dress for Success

"Hey Mom!" Whooping Crane chicks bond with the first big object they see after they hatch. This is how we dress to make sure our captive-reared chicks know they are Whooping Cranes when they are released into the wild. *Remember...no talking!*



Adult Whooping Cranes have a red, white and black pattern on their heads, and so do our hand puppets. This will help the chicks recognize other Whooping Cranes in the wild.

A screened window hides our faces from the chicks. We can see out, but the chicks can't see in!

We cover ourselves from head to toe with a loose white costume so chicks can't see the person inside.

Parent Whooping Cranes make "contact calls" to keep their chicks close by. We play the same calls with an Mp3 player hidden in a secret pocket of the costume.

Black "wingtips" are just like the primary feathers of adult Whooping Cranes.

Sturdy boots are needed for mucking around in marshes.

To become a member visit savingcranes.org

INTERNATIONAL CRANE FOUNDATION

Juvenile Development

Whooping Crane chicks are precocial, meaning they are mobile soon after hatching. A Whooping Crane chick can begin walking or taking its first steps within a few hours after hatching and it will begin swimming after 24 hours. At this time, they are covered in a soft downy plumage which means they get cold very easily. Downy feathers are not waterproof, and they do not help retain heat like contour or flight feathers do. For this reason, they will remain dependent on their parents to keep them warm for the first few days after hatching by brooding under their wings at night.

Whooping Crane chicks also grow incredibly fast. In their early development they can grow 1 inch per day and by 3 months old they are around 5 feet tall! Within 80-100 days they will begin flying and by 120 days the chicks will start to shift from a cinnamon brown color to having white feathers along their neck and their back. By the following spring a Whooping Crane juvenile will be predominantly white, and their facial features (red crown, black mask) will be more prominent. Cinnamon coloring will remain on their head, upper neck, and parts of their wings. When their second summer comes around, a Whooping Crane juvenile will have adult plumage and belong to a bachelor flock. When they are 4-5 years old, they will begin breeding!

A timeline of a Whooping Crane's development from chick to adult within the span of ~1 year.

Whooping Crane Releases

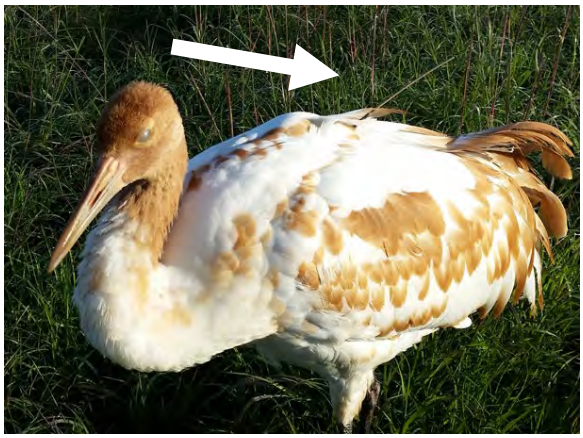
The International Crane Foundation (ICF) has released Whooping Cranes into the wild in a variety of ways. In 2001 they began releasing birds through Operation Migration, a project which utilized ultralight aircraft driven by a pilot wearing a crane costume and broadcasting a Whooping Crane's brooding call. This flight led Whooping Cranes along a recreated migratory route from Wisconsin to Florida and is credited with reintroducing Whooping Cranes to Wisconsin. The first flight lasted a few months and covered 1,200 miles. Operation Migration

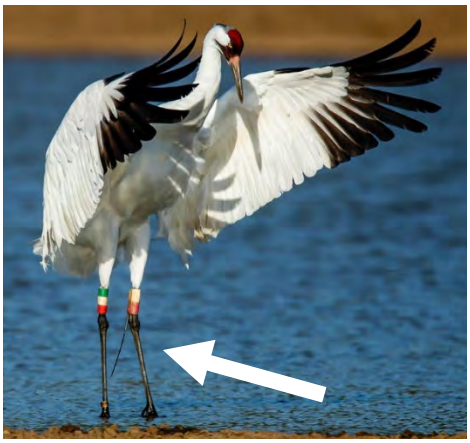
concluded in 2016. In 2005, ICF began releasing Whooping Crane juvenile in the fall near adult Whooping Cranes to join them on migration. This method was called Direct Autumn Release (DAR) and concluded in 2015. Since 2016, ICF has been implementing a parent-reared release program which releases Whooping Crane chicks raised by captive Whooping Crane pairs. The chicks are released near the territory of wild adult Whooping Cranes who are expected to adopt the chick and lead it on its migratory path. ICF has also released Whooping Cranes into 2 non-migratory populations in Florida and Louisiana. While the Florida population is no longer receiving Whooping Cranes for release, the Louisiana Non-Migratory Population (LNMP) was created in 2011 and continues to grow through wild hatches and released juveniles. As of January 2022, the population total is 72 cranes for this non-migratory site. Some of the eggs used in this reintroduction start at ICF and were raised by aviculturists using the Whooping Crane costume. These cranes were introduced to this area in hopes of establishing more self-sustaining wild populations. In doing so, this ensures a more stable future for the Whooping Cranes in the case that an event wipes out a separate population.

Banded Cranes

Some cranes wear “jewelry” on their legs. These colorful bands, or metal rings, are used by researchers to mark and identify cranes, and each crane has a unique combination of colorful bands that tell biologists who that bird is. Many researchers across North America – and the world – band cranes to help answer questions about migration, habitat selection and other topics. In the Eastern Migratory Population (EMP) and Louisiana Non-Migratory Population (LNMP), 100% of the Whooping Cranes are banded. Many Sandhill Cranes are also banded throughout the United States.

In addition to bands, some cranes are also outfitted with radio transmitters which can be attached to the colorful lag band or outfitted on their back like a backpack. These are easily spotted as they look like a stick or antenna hanging off of their leg or back. Radio transmitters help biologists and volunteers track the cranes because they emit a unique radio frequency that can be picked up with an antenna to track the crane to an exact location.

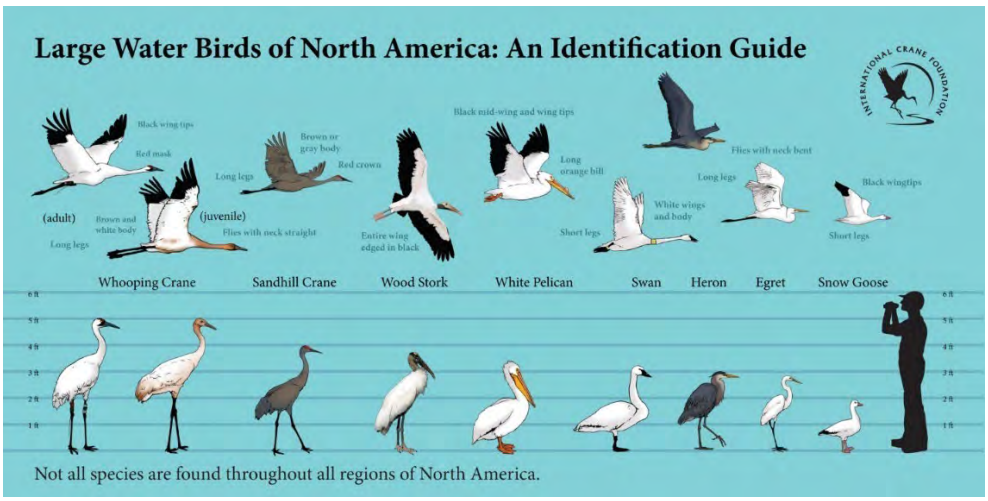




To report a banded crane please visit the website **www.bandedcranes.org** and input the required information about your banded crane sighting.

WHOOPING CRANE FLIGHT AND MIGRATION

Whooping Cranes and all other crane species fly with their necks outstretched, and while in flight, their black wing tips can be seen from below. These black wing tips have more melanin in them, and melanin provides more strength to these feathers which undergo the most wear and tear in flight. While in flight, Whooping Cranes often take advantage of thermals which are rising pockets of warm air. By flying with the assistance of thermals, they can be propelled forward while saving energy.



Many birds look similar to Whooping Cranes in flight. Use this handy guide (provided in crane trunk as a handout) to help in identifying a Whooping Crane

Whooping Cranes migrate in the fall (October-November) and spring (February-April) in search of food and more favorable weather conditions. They only migrate during the day, so at night they will stop at stopover habitats, also called staging grounds, to find food to eat and water to drink and roost in overnight for safety. They may also stop for longer periods to rest and refuel longer, wait out a storm, or wait for more favorable temperatures. While Whooping Cranes are descending to these stopover habitats, they are often flying low, very tired, and less observant so they run the risk of colliding with powerlines. The International Crane Foundation is partnering with power companies to either bury power lines in popular stopover areas or mark power lines with reflective tags called flight diverters to make them more visible.

The Eastern Migratory Population (EMP) migration route is only 200-800 miles. These Whooping Cranes will spend their winter at Wheeler National Wildlife Refuge in Alabama, Hiwassee Wildlife Refuge in Tennessee, or Jasper-Pulaski or Goose Pond Fish and Wildlife Areas in Indiana. In the summer they are predominantly in Wisconsin at either Necedah National Wildlife Refuge, Horicon National Wildlife Refuge, or White River Marsh State Wildlife Area. Cranes migrating from Alabama may take a week to reach Wisconsin, while cranes migrating from Indiana may only take 1 day.

Migrating Whooping Cranes can often be spotted alongside migrating Sandhill Cranes, though they exhibit very different flocking behaviors. Sandhill Cranes form incredibly large flocks, sometimes in the 1000s of individuals. Whooping Cranes, on the other hand, do not form flocks, but instead remain within their pair or family unit and you often will not see more than 4 Whooping Cranes together at a time. To track Whooping cranes in the EMP on their migration, head to **www.whoopermap.savingcranes.org** for updated information!

A Whooping Crane and Sandhill Cranes at a large wetland stopover habitat in Nebraska along the Platte River. Photo by Jim Braswell.

"I GIVE A WHOOP"

Why should we protect Whooping Cranes?

Whooping Cranes are an ancient species, recorded to have lived along the Texas coast as far back as 1200, and they are a symbol of the wilderness that was lost in the 1940's following massive habitat destruction and unregulated hunting. By rebuilding this population to a sustainable level, reminiscent of the historic flocks on a modern landscape, we are motivated to take better care of wetlands that are necessary to support wild Whooping Cranes. Whooping Cranes are considered a keystone wetland species and occupy an incredibly important niche as a predator and as prey. As a predator they eat both plant and animal matter including crayfish, crabs, fish, snakes, frogs, insects, berries, seeds and tubers which can all be found in healthy wetlands. They are also an important source of food for foxes, wolves, coyotes, lynxes, bobcats, and raccoons. This means that by protecting Whooping Cranes and the large wetland habitats they rely on, we can also protect countless other wetland species, some of which may be endangered, less charismatic, or occupy less space.

Additionally, by protecting Whooping Cranes and their habitats, we are able to address issues related to climate change and clean water, both of which can also impact people. Streams and wetlands support one-third of threatened and endangered species and are the source of drinking water for 1 in 3 Americans. Without the large wetlands needed to support Whooping Cranes, we also lose the benefits of water filtration and flood regulation that wetlands provide. Climate change can also be addressed wetlands can store large amounts of carbon which is essential for reducing the long-term impacts of climate change.

Finally, many crane species, including Whooping Cranes, are highly symbolic and inspirational in human cultures. Whooping Cranes have persevered despite immense hurdles, they are long-lived, put many months of care into raising their offspring, dance with their partner, mate for life, and their calls can be heard for miles. In many ways humans can relate to Whooping Cranes

Be a Crane Hero

Whooping Cranes were once on the brink of extinction and continue to face threats as their populations slowly rebuild. Seeing a Whooping Crane on the landscape is a sign of conservation measures working and is very exciting. We encourage you to be excited about Whooping Cranes in your community and share with your friends, family, and neighbors these Whooping Crane safe behaviors.

- Stay 200 yards (2 football fields) away from cranes at all times.
- Understand their behaviors – head up and wings back mean take a step back!
- Respect private property and only park in designated areas to view Whooping Cranes.
- Report all Whooping Crane harassment, disturbance or poaching to 1-800-TIP-DNR.
- Report banded Whooping Cranes to **bandedcranes.org.**
- Share only the county and state where you see a Whooping Crane.

GLOSSARY

Adaptation: Something that an organism has or does that helps it survive in its environment.

Bachelor Flock: A group of young cranes which stays together until they pair and begin breeding.

Band: Identification "bracelet" used on birds. ICF fastens an aluminum band with an identification number just above the hock (ankle) joint on all captive birds.

Barbs: One of the parallel filaments projecting from the main shaft of a feather.

Barbules: Small barbs or pointed projections, especially one of the small projections fringing the edges of the barbs of feathers.

Clutch: The eggs laid by a female in a single nesting. In the wild, cranes usually lay a two-egg clutch.

Contour Feathers: Feathers that form the general covering of a bird. They are stiff, strong, and light. Contour feathers are comprised of a hollow quill with many barbs.

Coverts: The small feathers which overlie the base of the flight feathers.

Egg Tooth: A whitish, horny tubercle near the tip of the upper mandible of a bird embryo. It is used to break the eggshell during hatching and is cast off shortly after the chick emerges.

Fledging: Acquiring the feathers necessary for flight. The process is completed at about three months of age in cranes. A crane who has completed this step is called a "fledgling".

Habitat: The environment in which an animal lives containing food, water, shelter, and space in a suitable arrangement to meet the animal's needs.

Hock: This is a joint equivalent to our ankle. From the hock down, is the "foot" of the crane. They walk on what is equivalent to our toes.

Imprinting: Rapid learning commonly found in ground-nesting birds. Chicks fix, or imprint, on the first object they see and hear after hatching – usually their parent. In some cases, imprinting also establishes a species identity, mating preferences, and habitat preferences.

Incubation: This means keeping eggs warm and moist until they hatch. "Brooding" means keeping the chicks warm and dry.

Mandible: The beak, formed by an extension of a skull bone combined with a horny substance called keratin. There are upper and lower mandibles.

Molt: Renewal of plumage in birds, which usually occurs once a year. Cranes molt in midsummer, after the breeding season.

Nares: Nostrils found on the upper mandible.

Omnivore: A species that feeds on both animal and vegetable matter.

Primaries: Thin feathers, 10-12 inches long, growing from the "hand" of the wing. They are used in forward propulsion during flight.

Pipping: Occurs when a chick inside the egg breaks a small hole in the shell and begins to breathe fresh air from the outside. Pipping is preceded by internal pipping, when the chick breaks the membrane of the air cell and starts to breathe with its lungs.

Precocial: A term describing a bird which hatches with down feathers, open eyes, and the ability to leave the nest within minutes or hours after hatching. Most ground-nesting birds, including cranes, are precocial – an adaptation which serves to reduce losses to predators. "Altricial" chicks are those which are naked and helpless when they hatch.

Secondaries: Feathers attached to the "forearm" of the wing inside the primaries. They are shorter and broader than primaries and are used in soaring and braking.

Sedge: A group of cranes.

Species: The fundamental biological classification consisting of very similar plants or animals.

Staging Ground: A stopover place for migrating birds, used for resting and feeding.

Tarsus: The part of the leg above the hock. It is equivalent to our shin.

Taxonomy: The arrangement and classification of animals into similar groups.

Tertials: Feathers attached to the "upper arm" of the wing, closest to the body. In cranes, the tertials are often modified for display. When the wings are folded, the tertials look like long tail feathers. The "bustle" on a crane consists of tertials.

Territory: An area defended by a pair of cranes during nesting. The territory size ranges from three to 250 acres.

Threat Display: A behavior displayed when a bird is threatened by predators or intruding cranes. Threats can consist of wing spreading, preening, arching, calling, and fluffing feathers.

Unison Call: An antiphonal territorial call given by mated pairs of cranes. During the unison call, the female and male usually have different vocalizations and postures.