

Activity 7: A Journey Through Time



Summary

Students explore the history of Whooping Crane restoration efforts and the importance of imprinting by watching a DVD, creating a timeline, and writing a fictional story.

Objectives

Students will be able to:

- Define imprinting and understand how it relates to Whooping Cranes.
- Explain how Whooping Cranes behavior evolves through adaptation to its environment
- Explore the importance of costume-rearing chicks
- Describe a Whooping Crane's life cycle
- Write a fictional story depicting a crane's life
- Create a timeline depicting the history of Whooping Crane management over the past century

Standards

Science F.8.7

Art and Design B.8.1

Environmental Education B.8.24

Materials Needed:

- WCEP DVD (in trunk)
- Copies of "Crossword Puzzle"
- Whooping Crane costume (in trunk)
- Copies of "Whooping Crane Timeline"
- Paper and writing utensils

Background:

Whooping Cranes were historically found across the northern United States and southern Canada in their breeding grounds. In the 1800s, they would spend the winter along the east coast of the United States, the Gulf Coast, and parts of Mexico. As a result of habitat loss and unregulated hunting, by 1950, there was only one small population of approximately fifteen Whooping Cranes left that migrated between Texas and Canada. The Whooping Crane was on the brink of extinction, and conservationists realized that ambitious recovery efforts were needed to save the species. Projects to protect the wild population and to create new populations were put in motion and began the Whooping Crane's long journey to recovery.

A **clutch** is the number of eggs that a bird lays at a time. Whooping Cranes lay two eggs per clutch. However, they usually only raise a single chick. In order to collect eggs for restoring the population, scientists believed that one egg could be removed from each new nest without decreasing the productivity of the wild population. Egg collection began in 1967. In 1975, the U.S. Geological Survey's Patuxent Wildlife Research Center in Maryland began successfully breeding Whooping Cranes in captivity, and these eggs became the foundation for future release programs in North America.

Slowly, the population of Whooping Cranes was being rebuilt as birds were bred in captivity. However, with only one population of Whooping Cranes remaining in the world, scientists feared that any catastrophic event such as a natural disaster (e.g. a hurricane) or disease outbreak, could eliminate the entire population of birds. They determined that additional populations of Whooping Cranes needed to be established.

In 1993, biologists experimented with re-establishing an extirpated population of Whooping Cranes in Florida. This



Whooping Cranes usually lay two eggs per clutch, but usually only one survives. Photo: *International Crane*



Captive breeding of Whooping Cranes allowed for restoration projects. Photo: *U.S.G.S. Patuxent Wildlife Research Center*



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population would be non-migratory. Birds were released into the Florida Non-Migratory Population for 13 years. Unfortunately, nesting success by the introduced birds was poor, and only a few chicks have survived past the juvenile stage. Overall mortality rates have been high, primarily due to predation. No birds have been released into the Florida population since 2004 and only about 10 birds remain.

In 1999, the Whooping Crane Eastern Partnership (WCEP) was formed when nine government agencies and non-profit organizations joined together with a similar goal: restoring a second migratory population of Whooping Cranes to eastern North America, called the Eastern Migratory Population. Restoring a second migratory population in another part of the country helped safeguard the species from extinction; if something catastrophic happened to one population, the other population may be unaffected, ensuring survival for the species.

WCEP's goal is to establish a self-sustaining population of Whooping Cranes with a minimum of 120 birds and 30 breeding pairs that hatch and raise offspring on a regular basis. A **self-sustaining population** means that the Whooping Cranes in the wild are laying enough eggs and raising enough chicks that grow up and reproduce to keep the population size stable or growing. Eggs laid and hatched in captivity would no longer be needed to supplement the number of birds in the population.

Raising chicks in captivity requires a lot of hard work and special attention. Scientists need be especially attentive when the chicks are very young because during this time they undergo **imprinting** (a phenomenon exhibited by many species, but especially birds, in which after chicks hatch, they become socially attached to the first moving object they see). This bonding then influences how they choose a mate later in life. In a famous study, biologist Konrad Lorenz found that if he took on the role of mother goose by feeding and caring for the goslings, then the goslings mistakenly thought he was their mother and followed him everywhere he went.

Because Whooping Cranes are susceptible to imprinting, precautions need to be taken when humans work with young chicks. Crane costumes are worn by scientists and pilots so that when the cranes are released into the wild, they are not accustomed to humans. Wearing costumes masked the human face and figure so that chicks would not imprint upon humans.



Biologists wear crane costumes when interacting with young cranes to prevent them from imprinting on humans. Photo: U.S.G.S. Patuxent Wildlife Research Center

In 2011, a new effort to establish a non-migratory population in Louisiana began. This reintroduction has been a collaborative effort between the Louisiana Department of Wildlife and Fisheries, the US Fish & Wildlife Service, the US Geological Survey, the International Crane Foundation and the LA Cooperative Fish and Wildlife Research Unit. Historically, the Gulf Coast of Louisiana had a non-migratory population of Whooping Cranes until 1950. In 2016, a Whooping Crane chick hatched in the wild in Louisiana for the



first time in over 75 years. Scientists continue to release captive-raised cranes into that population. The Louisiana Non-Migratory Population currently has about 50 birds.

As of 2017, only the Whooping Cranes released into the Louisiana Non-Migratory Population are raised by costumed caretakers. Whooping Cranes in the Eastern Migratory Population are now being raised by a method called parent-rearing. This is where the chicks are raised by adult Whooping Cranes. Parent-rearing ensures that the chicks are properly imprinted and may teach the chicks cues that humans cannot. While it is a more natural method, fewer chicks can be raised each year at the facilities participating in the rearing and release program. Since the Whooping Cranes in the Eastern Migratory Population have relatively high numbers, biologists in the United States Fish and Wildlife Service have mandated a switch to the more natural parent-rearing method.

In the Eastern Migratory Population, another challenge scientists in WCEP had to overcome was how to teach juvenile Whooping Cranes to migrate. Chicks that hatched in captivity had no parents to teach them how to migrate. The three methods of teaching chicks the migration route were: ultralight conditioning, Direct Autumn Release (DAR), and Parent-rearing (PR). As of 2018 parent-rearing is the only method that is continued to be used for birds in the Eastern Migratory Population.

Ultralight conditioning involved training the chicks to follow ultralight aircraft flown by pilots in crane costumes on a 1,200-mile journey from Wisconsin to the southeastern United States. Direct Autumn Release birds were chicks that were released into groups of older Whooping or Sandhill Cranes and learned the migration route from these experienced birds that have made the migration in previous years. The Whooping Cranes that were released with these two methods were raised by costumed caretakers.



A costumed biologist feeds Whooping Crane chicks that are attending “flight school,” where chicks are conditioned to follow ultralight aircraft in order to learn the migration route from Wisconsin to Florida.

Photo: Operation Migration

Parent-reared birds are released into the wild near pairs of cranes to learn the migration from them. Parent-rearing is similar to Direct Autumn Release, except the juveniles of the parent-rearing method are raised by Whooping Cranes and not costumed caretakers. The juvenile Whooping Cranes and their surrogate parents are closely monitored to make sure the young are accepted by the older pair.

Procedure:

- 1) Hand out copies of the “Whooping Crane Crossword Puzzle” and let students look them over. Show students the “Bringing Back the Cranes” DVD to introduce them to Whooping Crane history, the specifics of the restoration project, the visual footage of the cranes and the habitats they use, and the techniques used in ultralight migration conditioning. Have students fill out the crossword puzzle as they watch the DVD.
- 2) Have the students try on the crane costume. The costume is meant to mask the human form, and the crane chicks imprint on the puppet head.



- 3) Have students create a timeline illustrating the history of Whooping Cranes since the 1800s and the management efforts that have been undertaken to restore the Whooping Cranes. Students can create their own timeline or use the worksheet provided.
- 4) Students should be able to explain some of the risks taken when Whooping Crane chicks are raised in captivity by humans. What are the advantages and disadvantages to having adult Whooping Cranes raise them, like in parent-rearing? Have students address the following issues in small groups or individually to understand how Whooping Crane behavior is influenced by the environment in which cranes mature:
 - a) When considering the potential effects of imprinting, explain why it is important for the scientists who raise the chicks to wear costumes.

So that Whooping Crane chicks will seek other Whooping Cranes as mates, rather than associate with people.

- b) What are some behaviors that can evolve in Whooping Cranes raised in captivity when they are not exposed to certain elements of a “wild” environment while they are maturing? Consider the possible differences in behavior between birds that are raised in the wild and birds that do not have to hunt their own food or worry about fleeing from predators because they are raised in captivity.

They may not know how to find their own food; they will not know how to migrate; they may not be familiar with potential predators.

- c) Describe how scientists are able to condition the chicks to learn the migration route by following the ultralight aircraft.

Scientists play the sound of the ultralight engines and Whooping Crane calls while the eggs are incubating and to the newly hatched chicks; they wear Whooping Crane costumes and never speak in front of the cranes to minimize exposure of the chicks to the sound of a human voice and the form of a human body; chicks are exposed to the ultralight aircraft when they are only a few days old; recording of crane calls are played from the ultralight aircraft; once the Whooping Cranes learn the route one time, they are familiar with it and can navigate it without the assistance of the ultralight aircraft.

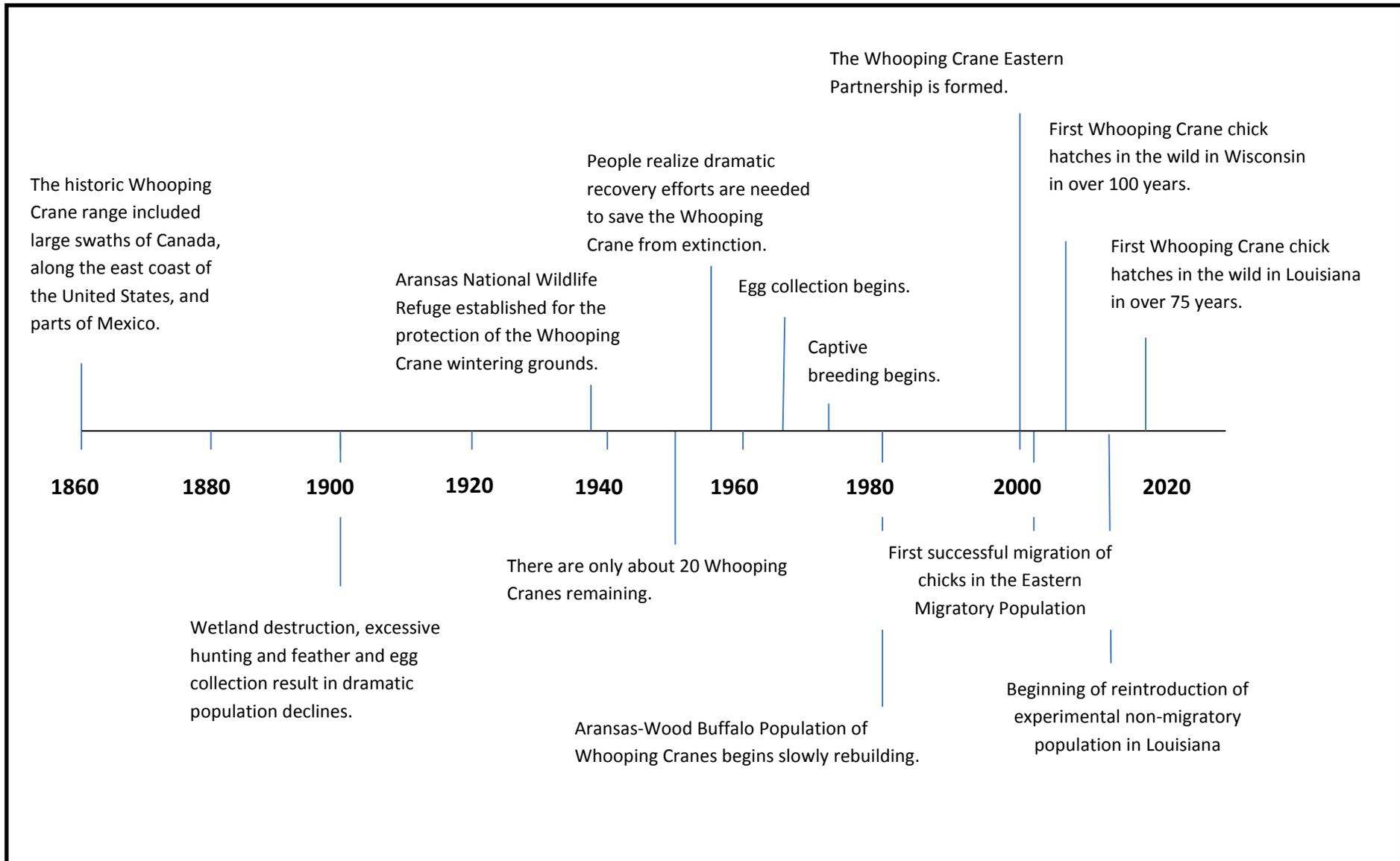


Following ultralight aircraft is one way that young Whooping Cranes that hatch in captivity have learned the migration route. *Photo: Operation Migration*

- 5) Adopt a Crane - Students should track the life of a “typical” Whooping Crane. Have students “adopt” a crane by writing a story about the life of a Whooping Crane in the Eastern Migratory Population or Louisiana Non-Migratory Population. Students should do some research (using periodicals and internet information) to track some of the current events involving Whooping Cranes over recent years. The story can be fictional but should also reflect some of the actual events. Students can visit a variety of organizational websites for information, including the International Crane Foundation, Operation Migration, and Journey North websites. The story can be illustrated as well. Have students draw their crane as a chick and as an adult. Stories should answer the following questions:
- Where did the bird hatch? In captivity? In the wild? In what state did the chick hatch?
 - What was its first year of life like? Was it hard to learn to fly? To learn to find food?
 - How did the chick learn to migrate? From the ultralight aircraft, other wild cranes, or its parents in the wild?
 - Where did the chick spend its first winter? In Florida? Georgia? Tennessee? What was it like?
 - What is the bird’s diet like? What does it like to eat and where does it find food most often?
 - Where is the crane’s favorite place to spend time and why? At a marsh? In a wetland on a wildlife refuge? At a farm with a small pond?
 - Does it like to interact with other Whooping Cranes? Why or why not?

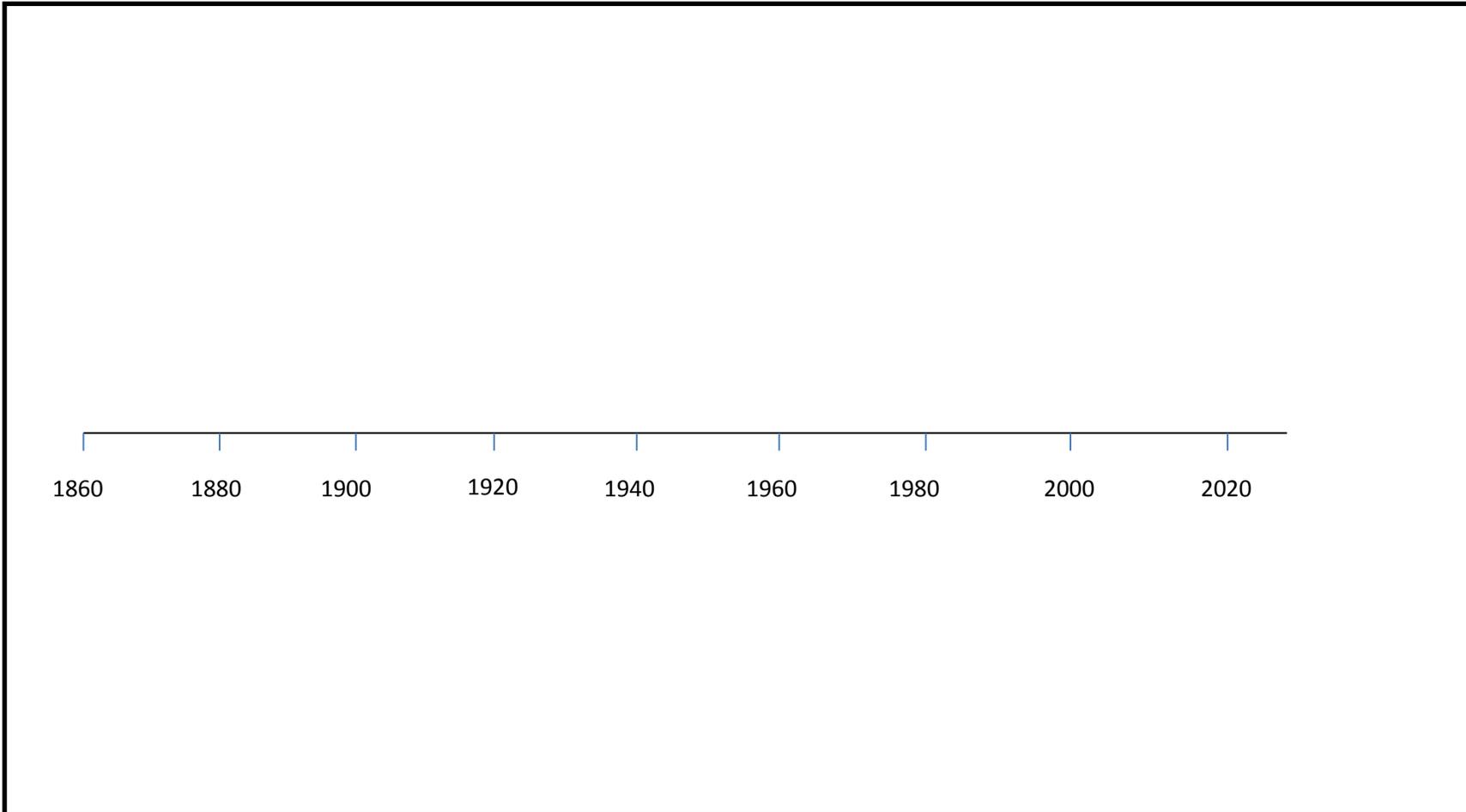


Example of Whooping Crane Timeline





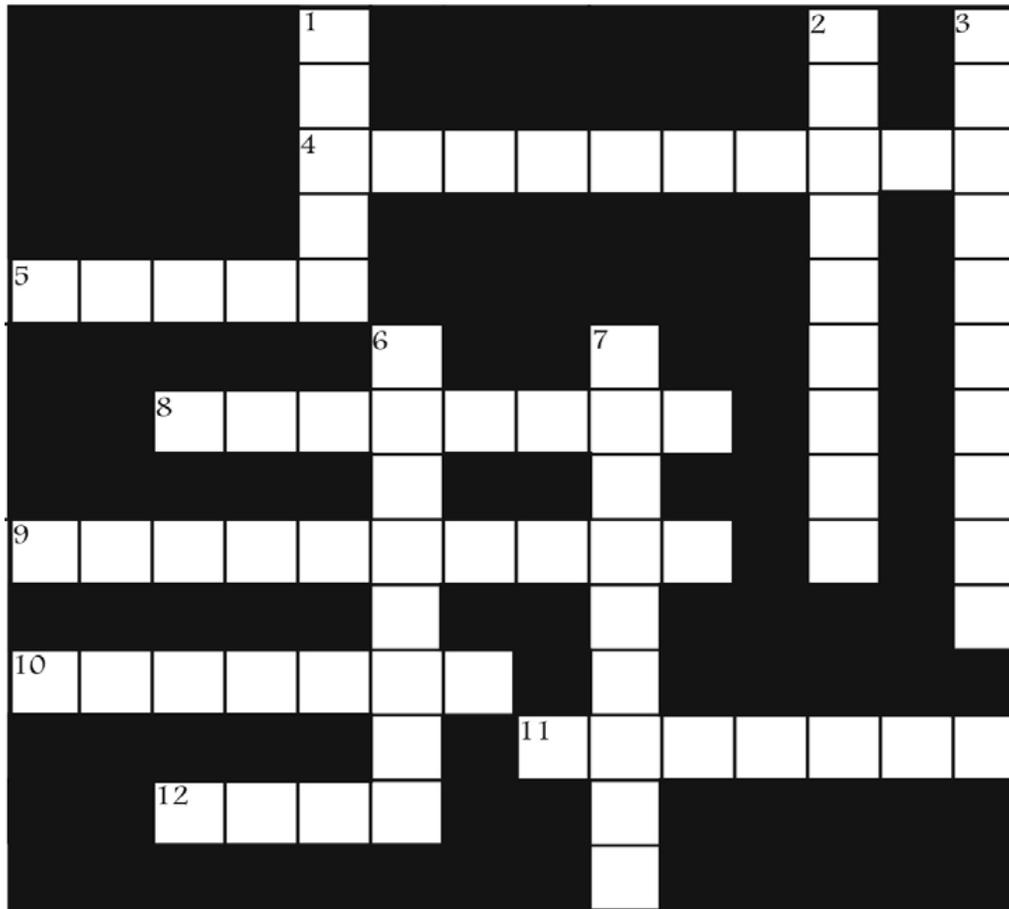
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1860 1880 1900 1920 1940 1960 1980 2000 2020



Whooping Crane Crossword Puzzle



Across

Down

- 4) Whooping Crane chicks raised in captivity were conditioned to follow this type of aircraft until 2016
- 5) The color of an adult Whooping Crane
- 8) A primary food source for Whooping Cranes in Texas during the winter
- 9) Collisions with these structures have killed dozens of Whooping Cranes over the years
- 10) Whooping Cranes declined because of habitat loss, egg collection, and this activity
- 11) By 1941, there was only 1 remaining Whooping Crane flock in the world with this estimated number of birds.
- 12) Birds lay these

- 1) The first step in reintroducing a second migratory population of Whooping Cranes was establishing a migratory _____
- 2) When birds travel south for the winter
- 3) When a species disappears forever; the Endangered Species Act was created to prevent this.
- 6) Whooping Cranes populations declined when this North American ecosystem began to disappear
- 7) Biologists track Whooping Crane chicks on their return migration using radio transmitters and this



Whooping Crane Crossword Puzzle Answer Key

Across

- 4) Ultralight
- 5) White
- 8) Blue Crab
- 9) Power Lines
- 10) Hunting
- 11) Fifteen
- 12) Eggs

Down

- 1) Route
- 2) Migration
- 3) Extinction
- 6) Wetlands
- 7) Satellite