

Thought Lab 19.2: Maintaining Genetic Diversity in the Whooping Crane

Purpose: Assessing the value of captive breeding programs in preserving the genetic diversity of an endangered species.

The whooping crane (*Grus americana*) is the tallest bird in North America. Standing 1.5 m high, this graceful white bird has a wingspan of 2.5 m. The whooping crane—affectionately referred to as the whooper—lives and breeds in shallow wetlands surrounded by bulrushes (*Scirpus* sp.) and other sedges. Its diet includes plant roots, crustaceans, mollusks, and insects. At age 3 to 4, it reaches sexual maturity. The adult whooper is known for its magnificent mating behaviour, which involves displays of plumage, courtship dances, and synchronized honking to signal its choice of a life mate. The female lays two eggs a year, but the couple will raise only one, usually the first to hatch, and may push the other from the nest.



The largest current population of whooping cranes migrates between Wood Buffalo National Park in northern Alberta and Aransas National Wildlife Refuge in southern Texas. Scientists estimate that there were 1400 migrating whooping cranes in the late 1800s. The total population fell to about 15 in the 1940s. Loss of habitat, excessive hunting, avian disease, and lead poisoning were some of the factors that contributed to their decline. The discovery and preservation of the whoopers' nesting and over-wintering grounds has helped to reverse this trend. The introduction of hunting regulations and the establishment of captive breeding programs, one of which is at the Calgary Zoo, has also helped. The world population of whoopers has now increased to over 300.

Procedure

Use the preceding information to answer the following Analysis questions. You may also use library, Internet, or other resources to help you answer the questions.

Analysis

1. All the whooping cranes that are alive today are descendants of the 15 or so that remained in the 1940s. Make a hypothesis about the degree of genetic diversity within current whooping crane populations, and justify your thinking.

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5. Suggest a method, other than captive breeding programs, that could be used to protect wild whooping cranes. Explain how this method works and how it would affect the world's population of whooping cranes.

Extensions

6. Evaluate the role of gene banks in helping to preserve endangered species, such as the whooping crane, and in helping to maintain genetic diversity within populations.
7. Identify and describe technologies that are being used by whooping crane breeders to improve the success of captive egg hatching and chick rearing.