



Teacher's Guide

Population Crash: Disappearing Horseshoe Crabs Nature Science Education Series

Grade Levels:

5-12

Subject Areas:

Sciences

Life Sciences

Biology

Ecology

Synopsis:

Follows a scientific investigation that reveals the link between declining populations of horseshoe crabs and red knots. Each year, red knots migrating from Tierra del Fuego stop along the Delaware Bay to feed on horseshoe crab eggs in preparation for their 4,000 mile journey to Arctic breeding grounds. Wildlife biologists, using various types of tagging and biometric observations, have discovered that unregulated use of horseshoe crabs as bait threatens both species. The episode details the life cycles and synchronicity that are common in nature, attesting to the disastrous effects that can occur when these patterns are interrupted.

Learning Objectives: Students will:

- Describe the life cycles of horseshoe crabs and red knots.
- Explain the biomedical uses of horseshoe crab blood.
- Recall how scientists were able to make the connection between dwindling populations of horseshoe crabs and red knots.
- Appreciate the significance of synchronicity in the natural world.

Vocabulary:

cataclysmic forces, eons, spawn, synchronicity, biometrics, banding, preened, toxins, clutch, emaciated, moratorium, sanctuary, cusp

Pre-Viewing Discussion:

What are the distinguishing features of horseshoe crabs? How large do they grow? Where are they found in North America?

If you have ever visited the seashore, you've probably observed several species of shore birds. What are some of these? Have you heard of a bird called the red knot? What does it look like?

Do shore birds migrate? How far do they fly on some of their migration routes? How far does the red knot fly on its route to the Arctic?

How do shore birds gain strength to fly thousands of miles without touching down for food or rest? Is there any way these birds could be dependent on creatures such as the horseshoe crab?

Post-Viewing Discussion:

In the recent past, why did fishermen harvest so many horseshoe crabs each year? What were the differences between the fishermen's treatment of horseshoe crabs and the biomedical use of horseshoe crab populations?

In total, how many miles does the red knot fly each year, from Tierra del Fuego to Arctic breeding grounds? Why are these birds so dependent on horseshoe crab populations?

What have biologists, fishermen, and people like you and I learned about synchronicity in nature from this example? Do you think that most people are aware of the importance of patterns in nature? What recent environmental lessons have we learned the hard way?

What other environmental conditions may affect the survival of horseshoe crabs or red knots?

Further Activities:

Find other examples of synchronicity in nature. Consider what would happen if one of these patterns was disrupted for any reason.

Further investigate the processes used to harvest horseshoe crab blood and use it to detect harmful bacteria in intravenous drugs.

Find out how fishermen prepared horseshoe crabs to be used as bait. Also investigate what they are using for bait now that there is a moratorium on horseshoe crabs.

Investigate the effectiveness of moratoriums on fishing certain endangered species.

Related New Dimension Media Title

The Living Oceans series

Biological Classification series