

AT-RISK SPECIES

Summary:

Students will analyze animals to learn which characteristics make a species “at-risk” of extinction.

Grade Levels: 5-8; 3-4

Time Estimate:

1 class period

Subjects:

science, math, art, history

Skills:

analysis, classification, comparison, evaluation, research, synthesis

Learning Objectives:

Students will be able to:

- ✓ Differentiate between species that are threatened, endangered, or extinct.
- ✓ Identify biological and human-influenced factors that make species susceptible to becoming endangered.
- ✓ Use species risk factors to rank species' susceptibility to becoming endangered.
- ✓ Evaluate local species' vulnerability based on what they have learned.

Materials:

- ✓ chalk and blackboard, or oak tag and markers
- ✓ Species Risk Worksheet
- ✓ Rare Scare Student Worksheet for grades 3-4, p. 31

Background

While any species can become endangered, there are certain characteristics of a plant or animal itself that make it more vulnerable to, or “at-risk” of becoming endangered than others. These include:

- 1. Specialized (diet and/or habitat):** Some animals are specialists because they eat only one type of food. These animals are especially vulnerable if their food source is destroyed. Also, some species are specialists because they can only live or make a nest in a very specific location, such as high altitude forests or vernal pools (temporary small wetlands). These types of specialists are also vulnerable to disturbance.
 - 2. Large Size:** Large animals, such as bears, elephants and tigers, tend to require a large amount of habitat in which to live and find all their basic survival needs. If habitat loss limits the areas in which they can live, these animals may not be able to find enough food or territory to survive.
 - 3. Slow Reproductive Rate:** Some species only produce one offspring at a time, and have long gestation periods.
- If the number of individuals of these slow breeding species, like condors, elephants, or bears, decreases, it takes a long time for the population to recover.
- 4. Migratory Lifestyle:** Animals that migrate need healthy habitats at both ends of their journeys and safe places to nest, feed, and rest along the way. They are therefore more susceptible than non-migratory animals to habitat destruction because they depend on multiple areas, each with its own conservation challenges.
 - 5. Perceived as Valuable by Humans:** Many animals and plants, and products made from them, are sold for their beauty, use in medicines, fashion, and the pet trade. There are both national laws and an international treaty controlling this trade (the Convention on International Trade in Endangered Species), but many species are still endangered by human use.
 - 6. Perceived as a Threat:** Large predators, such as wolves, may be perceived by humans as a threat to livestock. Grizzly bears and large cats that come into contact with humans are often feared by

people, even in cases where they are not posing a significant danger.

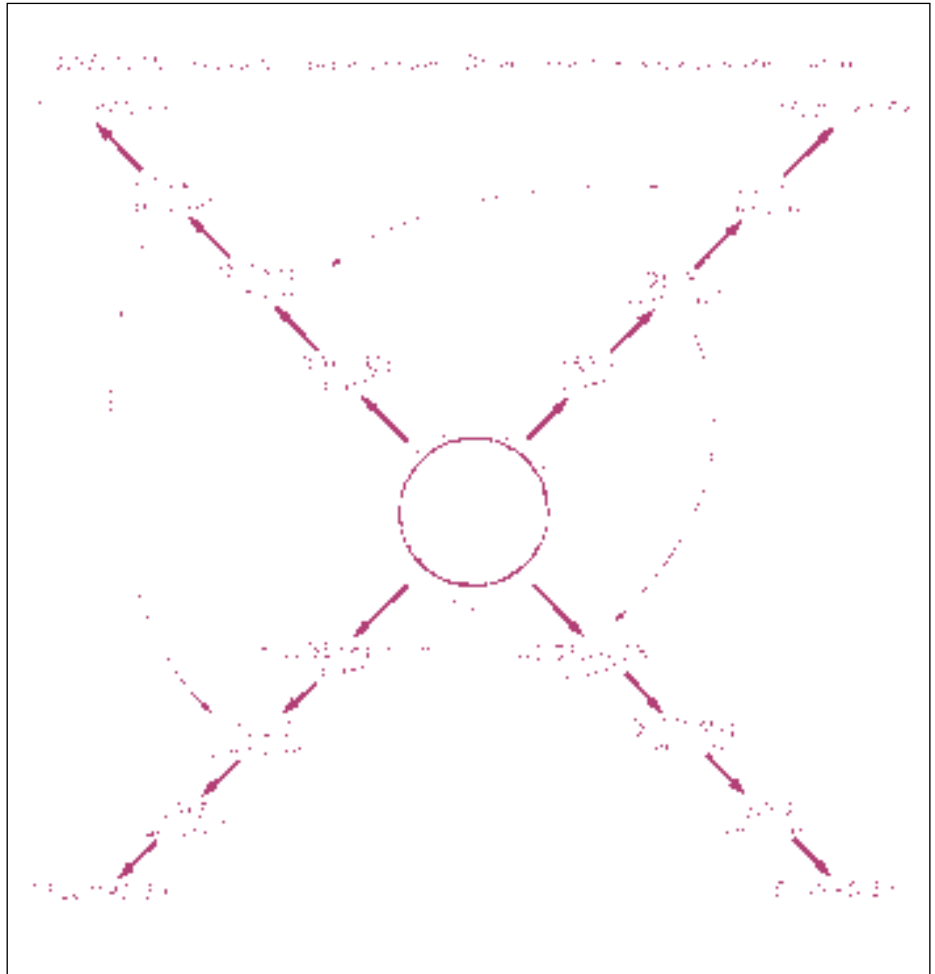
Teachers please note to your students: Because many factors affect a species' vulnerability, it is often difficult to determine which species are more "in danger" than others. Since many species are at risk of becoming extinct and in need of help, stress to your students that these are relative classifications, and no single species is "the most endangered."

Procedure

1. Lead students in a brainstorming session. Have them think of species they know are endangered, or exist in unusually low numbers, and list them on the board.
2. Next, have students look over this list and think of characteristics the animals and plants have in common that might relate to the fact that they are endangered (i.e., large, specialized diets, migratory, etc.). Write the new list of common characteristics on the board, too.
3. Draw lines between the species listed on the board and the list of common characteristics you just added, to show which characteristics apply to which species. Hopefully your list will include several species which will be connected to more than one of these characteristics, showing that these plants or animals are especially vulnerable, or "at-risk." You should be sure the students cover most of the following (or you can help your students along to these conclusions): Specialized (diet and/or habitat); Large Body Size; Slow Reproductive Rate; Migratory Lifestyle; Valuable; Perceived as a Threat (Note: these mainly, but not exclusively, apply to animal species). Try to assist your students in coming to these conclusions themselves, by asking guiding questions, and having them ask questions of each other. *What kinds of factors can they imagine would have an impact? Why?*
4. Next, hand out the activity sheet and the KWA Species Cards. Have students write in the top risk factors they have just determined into the top row of the chart. Work through an example in the Species Risk Chart with the whole class. Then divide students into small groups to use the KWA Species Cards to complete the worksheet. Each group should list at least five plant or animal species in the left hand column. By using the information on the Species Cards, and any other supplemental information provided by the teacher or researched by the students, each group should rank the risk of each species.
5. When everyone has finished, have groups share their results with each other. As a class, have students brainstorm ideas for how humans can help these species survive despite their risks. *What kinds of things are scientists and conservationists doing to help these species? What can we do?*

Modifications for Younger Students (Grades 3-4)

1. Hand out copies of the Rare Scare Student Worksheet to each student. Explain that each of these animals is imaginary, but each has characteristics that are similar to those of real animals living today. Have the students read the information given for each animal, then have them decide which of the animals would be the first to become endangered and extinct as more and more people move into the area where each animal lives.
2. After each student has picked an animal, take a tally to see how many students voted for each animal. Ask students to explain why they picked these animals.
3. Explain to the students that many animals that are threatened or endangered share one or several characteristics that make them more likely to go extinct. *Can they think of what these might be?* Brainstorm some ideas with the students, then discuss some of these characteristics.
4. After the discussion, have students look at their worksheet again to see if they agree with their original choices.



Take another vote and compare the results.

5. Explain that the crested crabbit is the animal that will probably become extinct first because it has so many of the characteristics that make animals vulnerable, including limited range, low birth rate, specialized diet, migratory lifestyle, and limited nesting area. Emphasize that animals that have one or more of these characteristics usually do fine until people come along in large

numbers, and create habitat loss and pollution.

Extension

Introduce the vocabulary words **producers** and **consumers**, **predators** and **prey**. Have small groups of students group their KWA Cards into each category, thinking about possible feeding relationships between the species. Next, still in small groups, students should use the diet information on their KWA Cards to draw food chains, adding species if necessary to

make a complete chain. They could take it a step further and make logical feeding connections between chains, and add in decomposers to create food webs. Do not forget to have the sun as the originating source of all of the food chains!

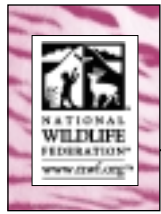
After students have completed their webs, discuss with them how human actions such as pollution and habitat destruction can impact food webs. How do these relationships affect their vulnerability to endangerment? You may also

wish to discuss how pesticides tend to accumulate in organisms' bodies as they move higher in the food chain (this is called **bioaccumulation**), and what effects this may have on species vulnerability.

Assessment

Have students do research on 3 or 4 local endangered or threatened species (or species they find in their schoolyard) of their choice, and then fill out the risk chart for each, justifying their rankings.

Ask students to propose specific solutions to the challenges these species face. *What are some of the ways humans can help them? What can the students do to help them?* Have student groups create cards for their own sets of imaginary animals, including their habitat needs, size and appearance, diet, predators, etc., and test them out on each other in pairs, having each pair determine which ones are most vulnerable to becoming endangered or extinct.



WORK SHEET

SPECIES RISK CHART



■ List 6 primary factors that determine a species' risk of becoming endangered:

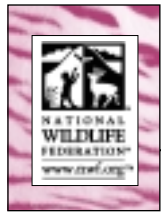
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

■ For each of the plant or animal species that your group is investigating, learn about the species characteristics on your KWA Species Cards. Then, rank each species in each of the six risk (more likely to become endangered) categories using the following scale:

0: does not apply
 1: low vulnerability
 2: medium vulnerability
 3: highly vulnerable

■ After you have ranked each species, total the points in each row. Which species has the most points, and would you therefore expect to have the most risk of extinction?

Species Name	RISK FACTOR						Total Score
	<i>large size</i>						
	1	2	3	4	5	6	
<i>Ex: grizzly bear</i>	3						



WORKSHEET

SPECIES RISK CHART



- **Explain why you ranked your species the way you did in a paragraph below. Which species is most likely to become extinct? Why? Also, based on your reasoning, predict/describe what you think will happen to the species. For example, how will the species be doing in 50 years? What are some of the actions humans could do to help them?**



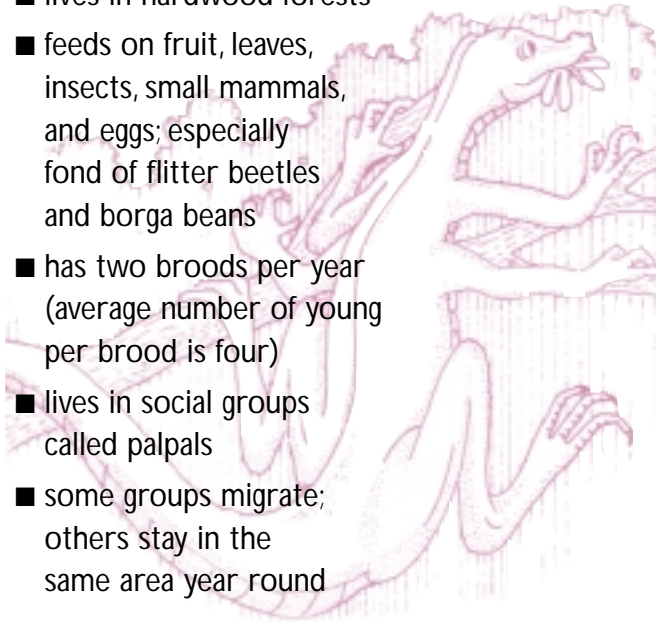
WORK SHEET

RARE SCARE



ROUGH-BELLIED BEAN-BEAN

- lives in hardwood forests
- feeds on fruit, leaves, insects, small mammals, and eggs; especially fond of flitter beetles and borga beans
- has two broods per year (average number of young per brood is four)
- lives in social groups called palpals
- some groups migrate; others stay in the same area year round



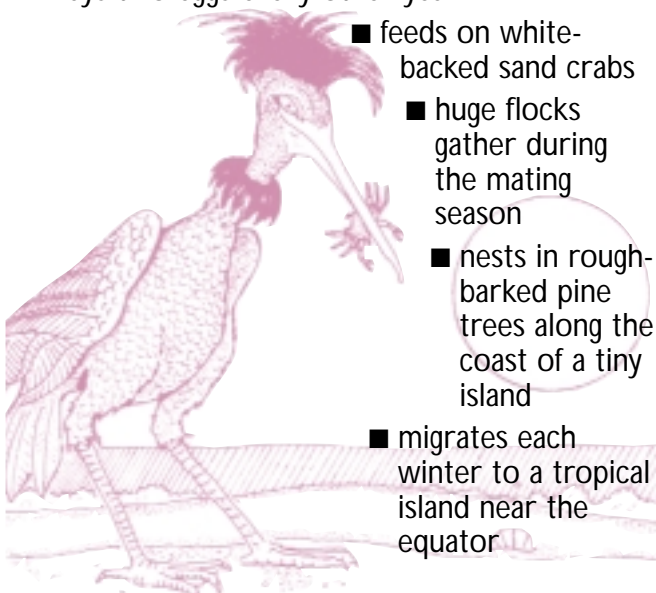
ZORGAN

- lives in burrows
- is often found in hilly and mountainous areas north of the equator
- feeds on camcams, miras, and other fruits
- mates for life
- can have two or three broods per year, but usually has one; often gives birth to twins, but one of the twins usually dies
- is noted for its beautiful blue fur



CRESTED CRABBIT

- is noted for its shiny purple crest feathers
- lays two eggs every other year
- feeds on white-backed sand crabs
- huge flocks gather during the mating season
- nests in rough-barked pine trees along the coast of a tiny island
- migrates each winter to a tropical island near the equator



GREEN GOOR

- lives in streams and marshes
- feeds on fish, eggs, tadpoles, and aquatic insects; especially fond of mosquito larvae
- hibernates in clusters in the mud during cold months
- lays an average of five eggs each year; eggs are sensitive to pesticide poisoning
- has been introduced into other areas to help control mosquitoes

