

# THREATENED AND ENDANGERED ANIMALS

An Extended Case Study for the Investigation and Evaluation  
of Issues Surrounding  
Threatened and Endangered Animals of the United States



David Hagengruber and Harold Hungerford

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**David Hagengruber**  
**Montana Fish, Wildlife and Parks**  
**1420 East 6th Street**  
**Helena, MT 59620**

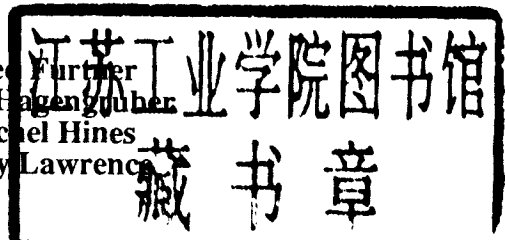
**and**

**Harold Hungerford**  
**Center for Curriculum, Staff Development and Evaluation**  
**1925 New Era Road**  
**Carbondale, IL 62901**

## **Art Work B**

**Pam Isner**  
**Adam Cartwright**  
**Hsing-Chao Chen**  
**Trevin Davis**

**Fred Furrer**  
**Dave Hagengruber**  
**Rachel Hines**  
**Gary Lawrence**



**With Special Editorial Assistance From:**  
**Drs. Trudi L. Volk and William J. Bluhm**

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## ACKNOWLEDGMENTS

Many are those that contribute, in one form or another, in the development of an instructional package such as this. The roots of such a document run deep and draw upon the expertise and creativity of many professional educators.

The first extended case studies which were developed in the late 1980's were the result of the collaboration of several professionals. Included in this development other than the junior author here would be individuals such as Dr. John Ramsey of the University of Houston, Dr. Trudi Volk of SIU-C, and Dr. Jerry Culen of the University of Florida.

The first commercially prepared extended case study was one entitled, *A Science-Technology-Society Case Study: Municipal Solid Waste* by Ramsey, Hungerford and Volk. The current case study - *Threatened and Endangered Animals* - draws heavily upon the solid waste case study as a model. The reader will notice considerable organizational similarity between the two in general and, in particular, in applications of elements such as the treatment of the *Lorax*. We are especially indebted to John Ramsey for substantial contributions to the solid waste case study and, by extension, to this one as well.

Others have provided welcome assistance to the completion of this publication. Included in this dimension would be people such as Dr. Tom Marcinkowski for his reference materials and Mr. Eric Tong for his work on Hawaiian species. A very special thanks go to Ms. Pam Isner who has, once again, contributed very substantially with her artistic ability.

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We now find ourselves in a position much like Noah's. Humans are both the cause of much wildlife extinction and the only ones who can save this resource. Which organisms should we save? Which ones can we save? . . .

Should we protect and preserve species that are dangerous?  
that compete with us?  
that interfere with our access to resources?

How do we make decisions about species that presently have no economic use?  
Are we willing to set aside some part of the world for a particular species or biological community even if it means we can never go there?

These are some of the questions that are the foundation of our future policy making, *in which you will be a participant*, either actively or passively.

Adapted from: W. P. Cunningham and B. W. Saigo, 1992

# **THREATENED AND ENDANGERED ANIMALS**

**An Extended Case Study for the Investigation and Evaluation of Issues  
Surrounding Threatened and Endangered Animals of the United States**

## **CHAPTER ONE**

### **GOAL LEVEL I - Part A**

#### **AN INTRODUCTION**

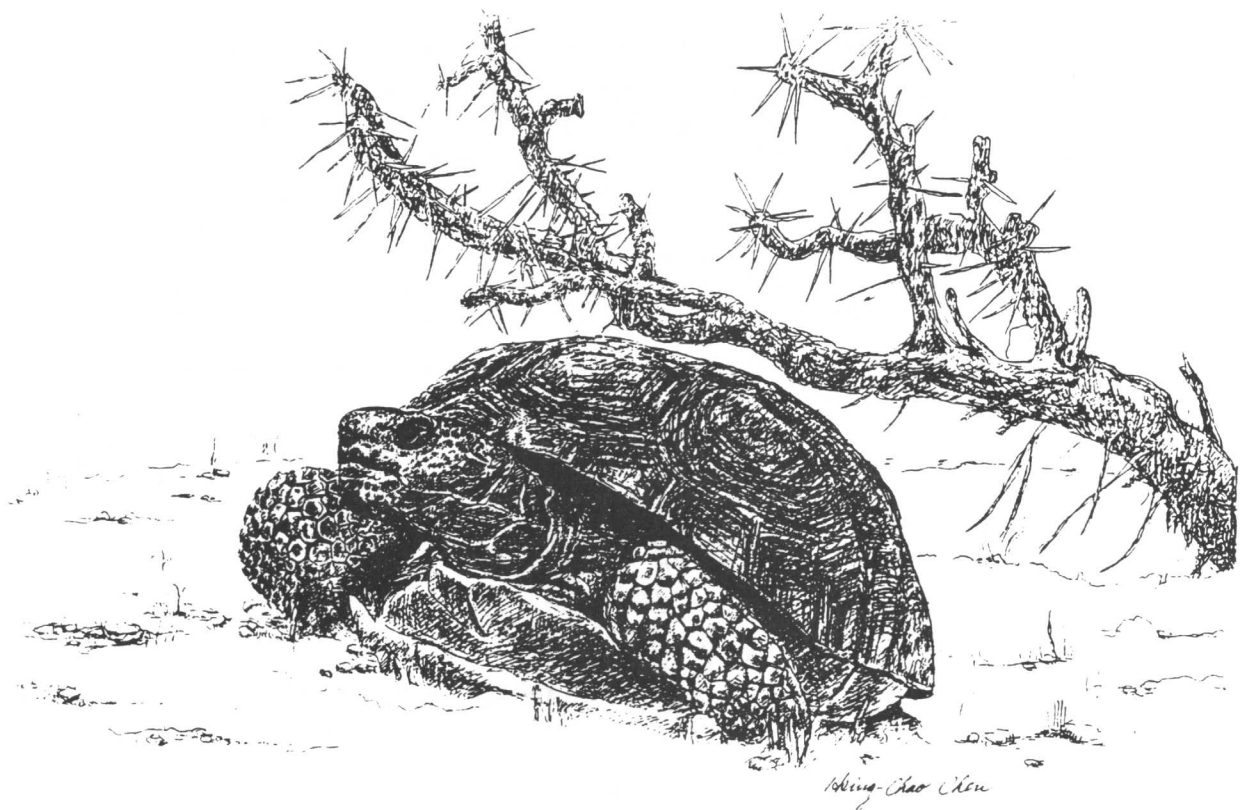
**In Goal Level I students are introduced to concepts (and definitions) related to animals being threatened, endangered, and extinct. Reasons for endangerment will be discussed as will the value of animals to natural systems and human beings. Some examples will be presented. A number of student activities associated with this environmental science foundations level will also be presented.**

#### **STUDENT TEXT AND ACTIVITIES**

## Sample Learner Objectives The Science Foundations Goal Level

Upon completing Goal Level I, students are expected to be able to . . .

1. . . . define "threatened", "endangered", and "extinct" as they relate to wildlife.
2. . . . bring together the various parts of the "buffalo" saga and communicate what lessons we might learn from this part of American history.
3. . . . identify and discuss reasons for animals becoming endangered.
4. . . . identify and discuss both known and potential values of animals to human beings.
5. . . . communicate the speed with which animals are becoming extinct compared to previous times in history. Provide some inferences why these extinctions have increased so dramatically.
6. . . . provide several examples of human behaviors which have caused extinctions and, today, threaten animal populations.
7. . . . provide evidence of and explanations for major land use management decisions or actions in their community/region. Identify those which threaten animal populations or caused the extinction of certain animal populations. [It would be important for the student to remember that insects, amphibians, reptiles, worms, and birds are examples of animals along with the mammals.]





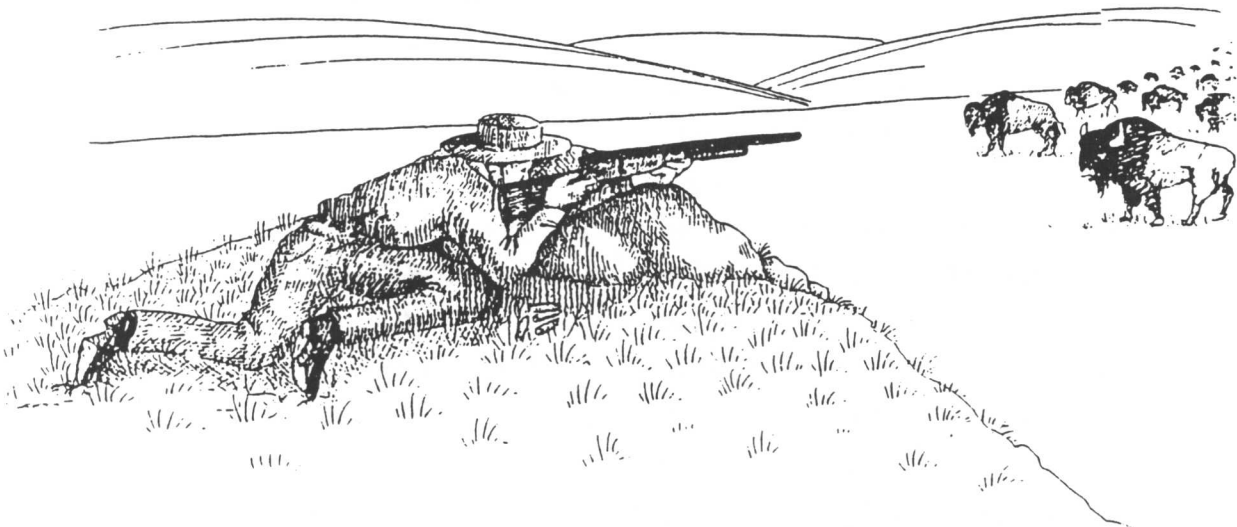
# A Lesson From Our Past

## Part I

*It was an unusually hot day for April. The year was 1869. It had rained hard the night before and the humidity was high. The two men in buckskins sweated heavily as they made their way to the top of the hill overlooking a broad grassy valley. The big bearded man with the broad-brimmed hat cursed softly as he caught his foot on a piece of granite rock hidden by green grass plants nearly a foot high. Although winter was still a clear memory, the big man's face was well tanned from many weeks in the sun on the plains of the Oklahoma Territory. His buckskins were cracked and filthy. He needed new ones. And, neither he nor his skinner smelled very good. It had been a long time since their last bath.*

*The skinner was a shorter man but it was obvious that there was great strength in his upper body. Also dressed in buckskins, his clothing had a greasy look and there was dried blood on much of him. He carried a pair of knives in sheaths on his belt. One of them had a wide blade, curved upward at the pointed end. The other was smaller, more like a dagger. Both were sharpened to a razor's edge. In fact, when he shaved, he shaved with the shorter one.*

*The two men had little love for each other even though their lives were thoroughly intertwined. The skinner was simply hired help and his job was a hard one. He and the other skinner (who was back a mile or so with the mules and wagons) skinned the buffalo and cured the hides. They also loaded the hides on the wagons for the long trip to the rail-head far to the north in Dodge City.*



*The big man was the hunter and the boss, and he would make decisions that would tell whether he could make a profit and pay the skinners their wages.*

*The hunter and the skinners had picked up the buffalo herd north of the Red River on the Texas border a few weeks earlier. The herd was moving slowly northward, feeding on the rich green grasses of the Oklahoma prairie. The hunters simply followed the buffalo, taking as many hides as could be skinned, dried and transported.*

*As the buffalo hunter and the skinner peered over the crest of the knoll, they gazed down on only forty or fifty animals. Evidently this group had left the main herd a day or so earlier and moved into this shallow green valley by themselves. The hunter shrugged his shoulders silently, knowing he could kill more than enough to keep his skinners busy and catch up with the main herd later.*

*The hunter slowly went to his knees with his Sharps rifle in his right hand. He then inched forward until his elbows rested in the soft soil behind a smooth but small boulder. He reached in his side pocket and withdrew a handful of the large cartridges the big bore of the rifle took. The cartridges were placed in a pile on the ground to his right. The rifle was very heavy and he rested the long barrel on the granite boulder.*

*The skinner, now beside the hunter on the knoll, pointed to a yearling calf at the edge of the herd. He knew that the young heifer would skin easily and also yield the most tender meat in the herd. They needed the meat because they had run out a day or two earlier. The hunter nodded, took aim and shot. The yearling's legs crumpled and he lay dead in a heap on the Oklahoma prairie.*

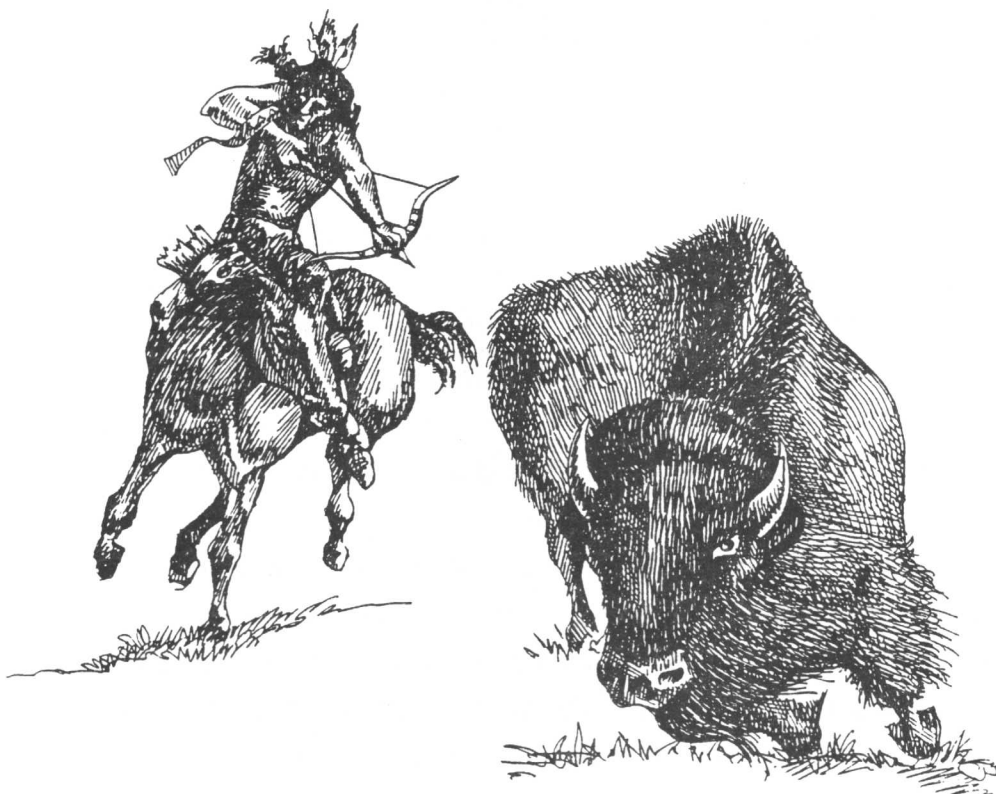
*The hunter knew that the sound of the rifle and the dying bison would probably not bolt the herd. The live animals would mill about nervously but probably stay long enough to insure a good kill. If any of the animals looked like they might run, they were killed quickly. He slipped another cartridge into the breech of the rifle and swung the barrel toward a cow heavy with calf. He barely felt the strong recoil but the cow felt the bullet tear through her lungs. She stood there for a few seconds blowing blood-flecked froth from her nostrils as she died. She rolled over on her side and her calf died soon afterwards inside her.*

*The killing went on for some time until enough bison lay dead or dying to keep the skinners busy for hours. These few dead bison represented only a drop in the bucket when one realizes that there may have originally been 60,000,000 buffalo west of the Mississippi River. But the killing was going on everywhere on the plains where the hunters could get the hides to a rail head for shipment eastward. And, too, the killing went on in some places simply for sport and in others to reduce the Indians' food supply. Those killed for sport or*

for political reasons were often just left to rot. Not even the hides were taken by the shooters.

## Part II

*There were four huge herds of buffalo on the Great Plains. Each had its own migration pattern, following the greening of the prairie grasses northward in the spring and southward to milder winters when the weather turned cold. This southern herd our hunter was after ranged from Texas northward to southwestern Kansas where its range overlapped that of the Arkansas Herd. The Arkansas Herd could be found from the Oklahoma panhandle as far north as the southwestern corner of what is now Nebraska. Northward into Wyoming and South Dakota ranged what was called the Republican Herd. Still northward into North Dakota, Montana, and Canada was the Northern Herd.*



*The southern or Texas Herd was huge and between 1872 and 1874 almost four million buffalo were killed out of it by white hunters and Indians. By 1879 the Texas Herd was gone and the plains of Oklahoma, Texas, and Kansas were littered with the bleached bones of millions of bison left to rot after their hides had been removed.*



*The end of the buffalo also spelled doom for the Plains Indians. In the first quarter of the 19th Century there were probably 300,000 Indians on the Great Plains totally dependent on the bison. There were the Puncahs, the Mandans, the Minatarees, and Ricarees as well as others like the Sioux, more well known in terms of history. The tribes had evolved with the bison and the Indian knew no other lifestyle. Whether on horseback or on foot, the Plains Indians were able to survive because of the enormous herds of buffalo that swept north and south each year.*

*For the Indian the bison meant meat, hides for clothing and shelter, armor in the form of shields that were arrow-proof, glue, jewelry, hair dressing and sinew. Further, the dried dung fueled fires that kept them warm on cold evenings on the prairie. Fall hunts allowed tons of meat to be dried to keep the tribes in foodstuffs through the winter.*

*During the days of plenty in spring and fall, feasts were commonplace in both Indian encampments and the camps of the trappers and fur traders. At these times, only the choicest cuts of meat were used with odd assortments of pieces being used with relish. Favorite cuts included the hump, the tongue and the intestines. It was not unusual for an individual to sit down to a feast of the choicest cuts and consume perhaps eight pounds of meat before quitting. At these times the wolves and coyotes of the plains were bloated with all they could eat because the bulk of the buffaloes was left unused by the feasting humans.*

*The coming of the white man to the Great Plains changed all of this in a matter of a few short decades. The Texas Herd was the first to go and by 1883 the Republican and Northern Herds had been slaughtered to the point that it was uneconomical to hunt commercially. By 1889 only 551 buffalo could be found alive in the United States.*

*In these few, short decades one can imagine what happened to the Indians. They went from independent, healthy human beings to a people totally dependent on the whims of the white man. Those that had not been exterminated were herded into seemingly worthless pieces of real estate and fed with "government beef". New and terrible conditions brought about a breakdown in the culture and social structure of the tribes from which, to this very day, they have not recovered. The greed and savagery of the white man on the Great Plains tends to be a forgotten part of our heritage, but it was very real and, in part, came about purposefully to push the Indians out of the way so that the plains could be ranched, farmed, and mined. We not only dedicate ourselves to forgetting this part of our history, we also seem dedicated to forgetting what happened to the Great Plains ecology in a few short decades with the coming of the white man.*

### **Part III**

*The Great Plains of North America covered a huge mass of land. The Great Plains stretched from the Mississippi River on the east to the Rocky Mountains to the west. North and south they existed from Canada southward into Texas. Most of the plains consisted of grasslands. There were the tall grasses to the east and the short grasses in the dryer, western portions of the Great Plains. The kinds of grasses that grew in different regions were controlled largely by the amount of rainfall - higher to the east and lower in the west.*

*For tens of thousands of years, the plains saw not one white man. These were the years during which a fascinating aboriginal American developed a very special relationship with the plains and the animals that lived there. This relationship was a fairly simple one in ecological terms. The basic relationship consisted of the following parts: (1) the soil of the plains, (2) the grasses of the plains, (3) the bison (buffalo), and (4) the Indian. All of these parts were interrelated. The ecologist might write these interrelationships like this: soil <-> grass <-> buffalo <-> Indian. What does this mean?*

*It means simply this. The grasses were dependent on the soil of the plains, the buffalo were dependent on the grasses, and the Indian upon the buffalo. We can also say that the Indian was, indirectly, dependent on the grasses and the soil as well. This soil <-> grass <-> buffalo <-> Indian relationship is fairly simple in ecological terms (there are far*

more complicated ones in nature). But, even though very simple, it was destroyed by greedy men selling hides and those who wanted the Indians and buffalo removed from the plains so that this huge land area could be used for other things. And, too, there is a lesson to be learned from all of this if we are intelligent enough to learn it.

No where is this lesson so well stated as in Durward Allen's book entitled *Our Wildlife Legacy*. Dr. Allen writes:

" . . . this soil-grass-buffalo-Indian relationship is a simplified replica of what modern men face in living on the earth's resources. Each item in the system is dynamic and exists by compromise with the others. When any one fails to compromise, there is trouble for the whole. The buffalo was an essential link between Indian and soil; and when the herds were destroyed, the result was immediate. Winter blizzards howled across empty campsites where only a decade before they had drummed against the taut sides of lodges." \*

\* - Durward L. Allen. *Our Wildlife Legacy*. New York: Funk and Wagnalls Company. 1954. p 17.

### Nebraska's Last Buffalo

Soon after the roundup of 1881, while I was out riding one day, I came across a trail that I took to be cow-calf tracks, and followed to see whose they were, and when I came in sight of them, I almost fell off my horse with astonishment, to find it was a herd of buffalo. There were twenty-eight grown ones and five calves in the herd. That country had been ridden over for four years by cowboys and hunters by the hundred, and no one had ever dreamed of seeing any buffalo there.

Frank was at the ranch and his daughter, a girl of twelve was there. Ed North, son of my older brother was also there. . . . Ed had never seen a wild buffalo before, and of course wanted to kill one. When we made a dash at them they ran off in two bunches, and Ed and I went after one bunch, and pretty soon he killed a three year old heifer. Frank and his daughter Stella ran after the other bunch and cut out a calf, which they chased around until it was so tired it could not run, but Frank had no rope and he didn't want to kill it, so let it go. . . . This band of buffalo was later killed . . . and I think they were the last buffalo ever seen on the North side of the Platte River in Nebraska.

From *Man Of The Plains*  
by Luther North

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### ACTIVITY: Some Things to Think About

1. The title of this story says that this is about a lesson from our past. What do you think this lesson is?
  
2. Communicate how each part of the soil <-> grass <-> buffalo <-> Indian relationship is connected to each of the others.
  
3. It is clear that things like economics affect decisions that we make about natural resources. How did economics affect the soil <-> grass <-> buffalo <-> Indian relationship?
  
4. You will recall that, in 1889, there were only 551 buffalo left in the United States. This small number was down from as many as 60,000,000 or so just a few decades earlier. If there had been a concept called "endangered species" in 1889, the buffalo would have been placed on the list of endangered species in an instant. Given what you read in the story and what is given you below, try to construct an explanation for the buffalo's population crash (decline). In other words, what were the reasons for the buffalo becoming a severely endangered species?

*In the 1870's there were those in the Congress of the United States that wrote legislation making it illegal for anyone to kill a female buffalo or more male buffaloes than could be used for food or commercial purposes. This bill was debated heatedly in and out of Congress. Some of those who supported the bill felt that it was immoral to try to starve the Indian into submission. There were others that said that wild, savage Indians should not be given any consideration compared to the poor, civilized settlers who simply wanted to use the buffalo's grass to graze their sheep and cattle. Even the Secretary of the Interior said that he would be glad when the last buffalo was gone. Still, the bill was passed in 1874. It was sent to President Ulysses S. Grant for his signature. He never signed it into law.*

Once again, your task with No. 4 is to explain in some detail why the buffalo became a severely endangered species.

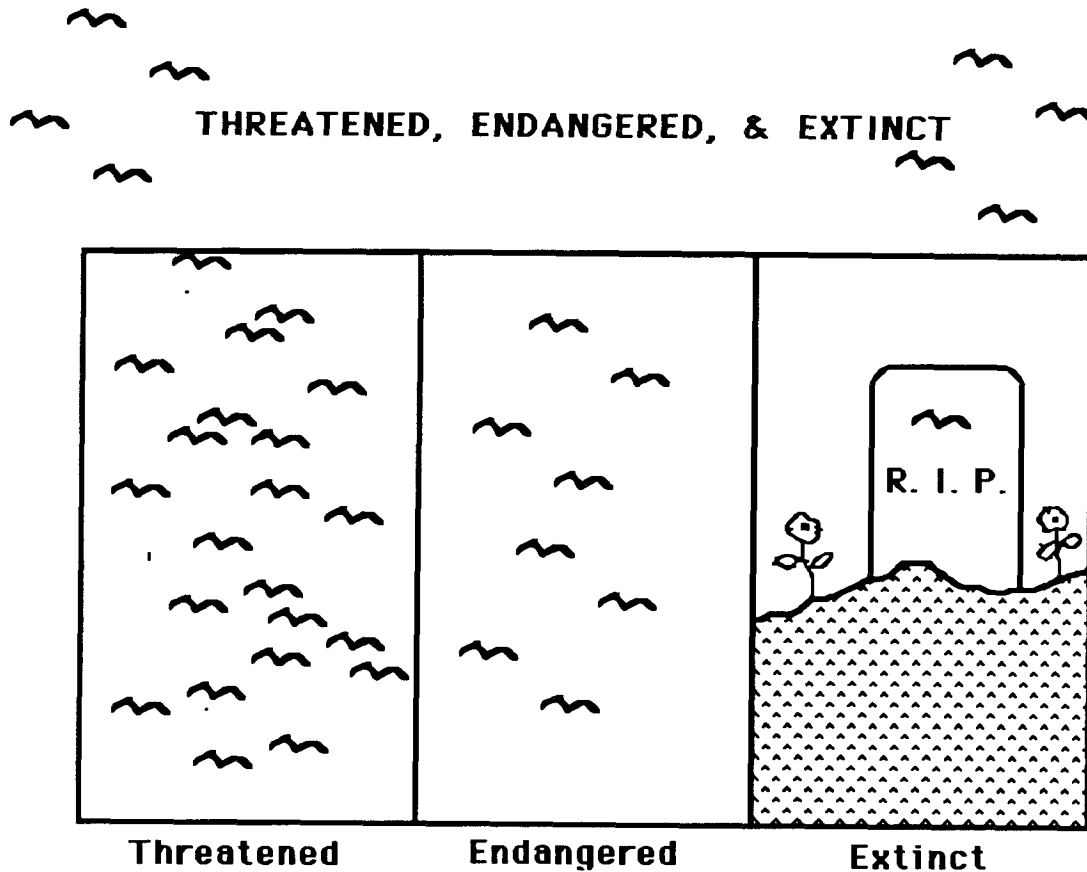
## Threatened! Endangered! Extinct! What Do These Words Mean?

An animal (or plant) species that is **threatened** is one that is still abundant in parts of its range but one which has declined in total numbers. It is also one that may be on the edge of extinction in certain areas. The bald eagle is an excellent example. The eastern cougar (Florida panther) is another. The American crocodile is still another. Numerous other animals and rare plants also share this classification - threatened.

An **extinct** species is one which is gone! Forever! It is one that has been completely eliminated. Examples of animals in the US. would include the passenger pigeon, Texas Henslow's sparrow, the dusky seaside sparrow, the insular long-tongued bat, the Anastasia Island cotton mouse, and the Rio Grande bluntnose shiner.

An **endangered** species is one that is in imminent danger of becoming extinct. No one knows exactly how many animals may be endangered in the US. But, when one considers all animal life - vertebrates and invertebrates as well - the number of species may be in the millions. In the United States, examples would be the spotted owl, the gray wolf, the black-footed ferret, Kemp's Ridley sea turtle, and the Indiana bat.

Perhaps these concepts are no better illustrated than with a cartoon developed by some southern Illinois fifth graders a few years ago. It follows:





## Examples of Threatened Endangered and Extinct Animals



Bald Eagle



Florida Panther



Passenger Pigeon