The Happy Prairie

Objectives:

Students will be able to: 1) evaluate the effects of different kinds of land use on the short grass prairie, and 2) discuss and evaluate lifestyle changes to minimize damaging effects on the short grass prairie.

Method:

Students create a collage of human land-use activities around an image of a prairie dog town.

Background:

Most human use of land affects wildlife habitat, positively or negatively. What humans do with land is a reflection of human priorities and lifestyles. The search for a modern day "good life" and all of its conveniences produces mixed results for wildlife and the natural environment. Sometimes people see undeveloped areas of natural environments as little more than raw material for human use. Others believe that the natural environment is to be preserved without regard for human needs. Still others yearn for a balance between economic growth and a healthy and vigorous natural environment. Very real differences of opinion regarding balance exist between well-meaning people.

At the core of land use issues is the concept of growth. Growth in natural systems has inherent limits, imposed by a dynamic balance of energy between all parts of the system. Energy in natural systems is translated into food, water, shelter, space and continued survival. This means that the vitality of natural systems is expressed by their ability to be self-regulating. This capacity for self-regulation makes it possible for all natural members of any ecosystem to live in harmony. All the life forms of any ecosystem must be considered. The microbes in the soil are just as necessary to a habitat as the plants and predators. It is this natural dynamic balance, with all its inherent and essential parts, that human land use tends to disturb. Human activities can often go beyond the natural limits of the habitat. Humans have the ability to import energy sources that allow a system to exceed its natural limits-or to remove energy sources that are necessary for a system to stay in balance. For example, people can build dams to create power, water can be captured for irrigation, wetlands can be drained for homes and buildings. All of these activities affect wildlife habitat.

On the short grass prairie, ranchers and farmers often view prairie dogs as pests, yet the prairie dog town is an integral part of the prairie ecosystem. Cultivation of prairie soils and prairie dog control programs have resulted in the reduction of prairie dog populations up to 98% in some areas, and elimination in others.

Given the extensive impacts humans have already had and continue to have on the land, a major challenge now facing humans is how to have a more responsible impact. How can we develop the awareness, knowledge, skills and commitment that are necessary in order for humans to take responsible actions affecting the remaining areas

of natural wildlife habitat? How can we develop the necessary understanding to restore a more natural dynamic balance in places where human disturbance has existed for centuries?

The major purpose of this activity is to encourage students to wrestle with these concerns. In this simulation, students use the "Happy Prairie" as a microcosm of environmental concerns involved in management decisions. They struggle with the arrangement of overlapping and conflicting land uses in a effort to conserve a prairie habitat. When the students reach some sort of agreement about local issues, the activity shifts to how their local decisions affect and might be applied to other areas of prairie within their region.. The activity ends with the consideration that humans have choices, and can choose to conserve the "Happy Prairie."

Materials:

For each three students: scissors; masking tape; paste or glue; paper; one set of land use cutouts; one Happy Prairie cutout; a large piece of paper (18" x 24" or 11" x 17") upon which to fasten the cutouts.

Procedures:

1) Prepare copies of the two cutout sheets ahead of time. Explain the activity. Tell the students that they will be responsible for arranging the pattern of land use around the Happy Prairie in such a way as to do the best they can to conserve the health of the prairie dog town and the surrounding area.

2) Divide the class into groups of three to five, with each group representing one of the interest groups. Students will stay in these groups until the end of the activity. Possible interest groups are:

>residents-want to build homes and live in the area
>farmers and ranchers-want to use the land to raise food and livestock
>parks department personnel-want people to have a place for recreation
>highway department personnel-want to build roads and maintain access to the area
>business representatives-want to build new industries and preserve jobs and commerce

NOTE: Add others that you think may be locally important.

3) Pass out the land use materials. Pass out the large piece of paper that will serve as the basis for each group's prairie and its associated land use activities. Have the students cut out the land use pieces and the Happy Prairie. Tell them that all the land use pieces must be used; park and ranch land may be cut to smaller sizes, but all the pieces must be used. Parts may touch, but not overlap. The students may also create additional land uses of their choosing. When they fasten the cutouts to their large base sheet, suggest that they use small loops of tape. This will allow them to change their minds before pasting the pieces down.

4) Once the students have cut out the necessary materials and are ready to begin the process of making land use decisions, have them first create a list of pros and cons for each land use. Guide the class discussion so that they consider the consequences of each land use. Record these on the chalkboard. The following are only a few of the many possible examples:

FARMERS/RANCHERS:
pros:
-produce food
-provide jobs
-provide economic base to the community

cons:
-plow prairie land for crop production, displacing the original wildlife.
-may eliminate prairie dog colonies
-may use pesticides (herbicides, insecticides) incorrectly, causing environmental problems

BUSINESSES:
pros:
-provide employment
-provide commerce
-create economic stability

cons:
-displace organisms of the short grass prairie
-produce wastes and sewage
-compete for a limited water supply

5) Have the students work in their teams for a long enough period of time to begin to seriously grapple with the challenge.

6) Invite each group to display and describe their work in progress. Encourage discussion of their choices. In the discussions emphasize that:
-no land use can be excluded
-wildlife habitat must be preserved; and
-**everyone** must agree enough to be able to support the decision of the group

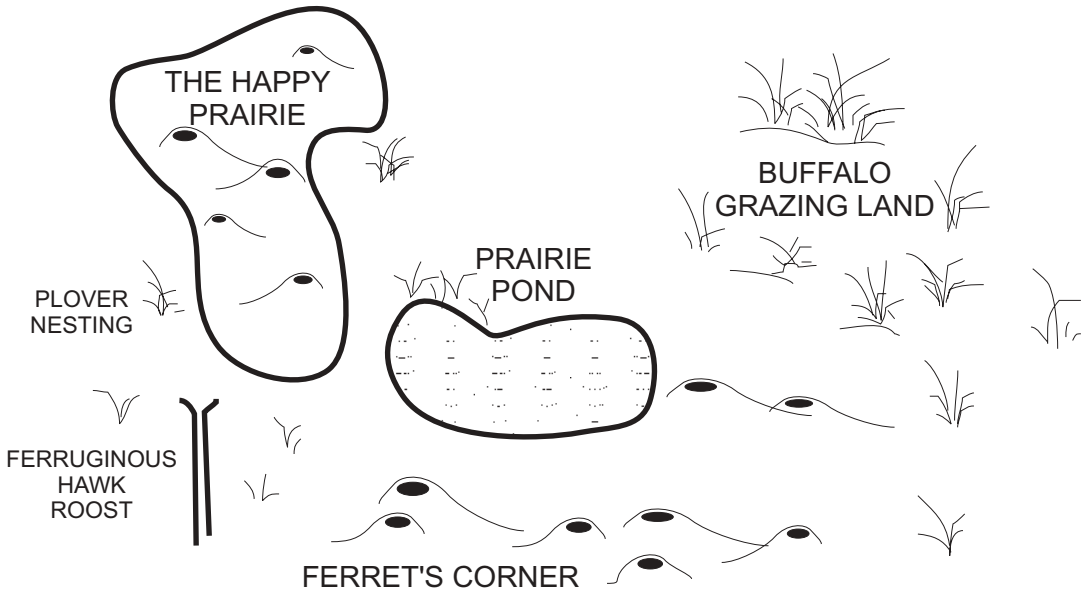
Look for the consequences of their proposed land use plan. Be firm about the issues, but fair about this being a difficult set of choices. Ask additional groups to show their work in progress and discuss their ideas.

NOTE: For wildlife habitat this is a "no-win" activity in many ways. The best that can be hoped for is that the land use plans will minimize the threats to the Happy Prairie.

7) Continue the discussion by asking more students to share their proposed plans. Again, be firm in discussing the consequences.

8) Give the students additional time working in their groups to come up with what they believe to be the best possible plan under the circumstances. Being sensitive to their frustrations, display all the final land use plans above the chalkboard for all to see and discuss. Analyze and discuss the merits of each of the approaches. Point out that although their solutions may not be perfect, they can minimize the damage to Happy Prairie.

9) Choose one of the students' images above the chalkboard. Next, on the chalkboard, continue further features of the short grass prairie.



10) Ask the students to brainstorm possible problems that could be faced within the short grass prairie region as a result of activity at the Happy Prairie. Make inferences and predictions about the potential consequences of these activities.

11) Ask students to look again at all of the land uses in this activity. If they had been considering any of them as inherently bad, have them consider a different question. What could the people who are actually in charge of these various land uses do to minimize damage to the Happy Prairie? Have the activity end with an emphasis on **solutions** rather than on problems. Also, many ranchers manage their ranches to conserve native grasslands and wildlife habitat, while also providing food and fiber for society and a living for their families.

12) Ask the students to create a list of things they personally can do to reduce the potentially damaging effects of their own lifestyles on prairie habitats and the environment in general. If possible, invite them to periodically, throughout the school

year, report on their progress in carrying out these new practices. Consider with them in discussion that people all over Texas and the United States have choices, and can choose to conserve assemblages of native plants and animals, such as the "Happy Prairie."

Extensions:

1) Do the activity again up to step six. After each interest group has presented its plan, form new groups with each of the new groups having a representative from each of the interest groups. Have the new groups devise plans that all of the interests can agree on. Discuss how, if at all, this is a realistic experience in working to balance various community interests.

2) Set up an action team to locate a prairie dog town in your community. Determine the overall quality of the prairie with which it is connected.

3) Collect newspaper articles for local short grass prairie-related and land use issues as a current events activity and discuss them in class.

4) Learn more about environmental impact statements. Try to obtain actual copies of statements about short grass prairies in your area. See what concerns are addressed in these documents.

5) Learn about the national wildlife refuge system. Are there any wildlife refuges in your area? What animals find refuge in them? Visit a national wildlife refuge.

6) Go to the library and locate private organizations that work to protect short grass prairies. Find out about what they do and how they do it. For example, use the National Wildlife Federation's Conservation Directory to look up conservation organizations in Texas and write letters to those who might be involved in projects about the short grass prairie.

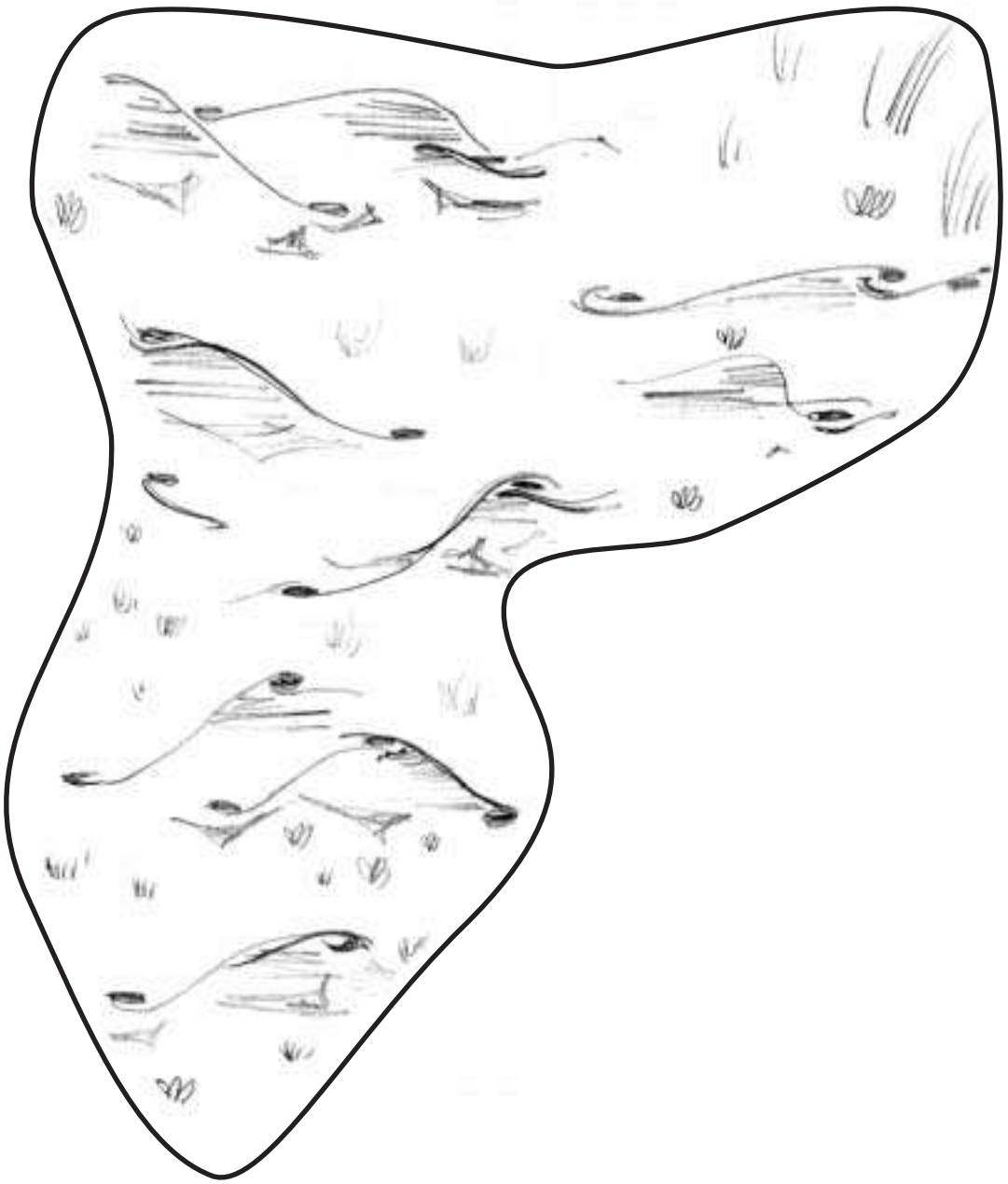
7) Find out about any zoning laws or land use regulations in your area. Would the plan your group proposed for the Happy Prairie be allowed in your community?

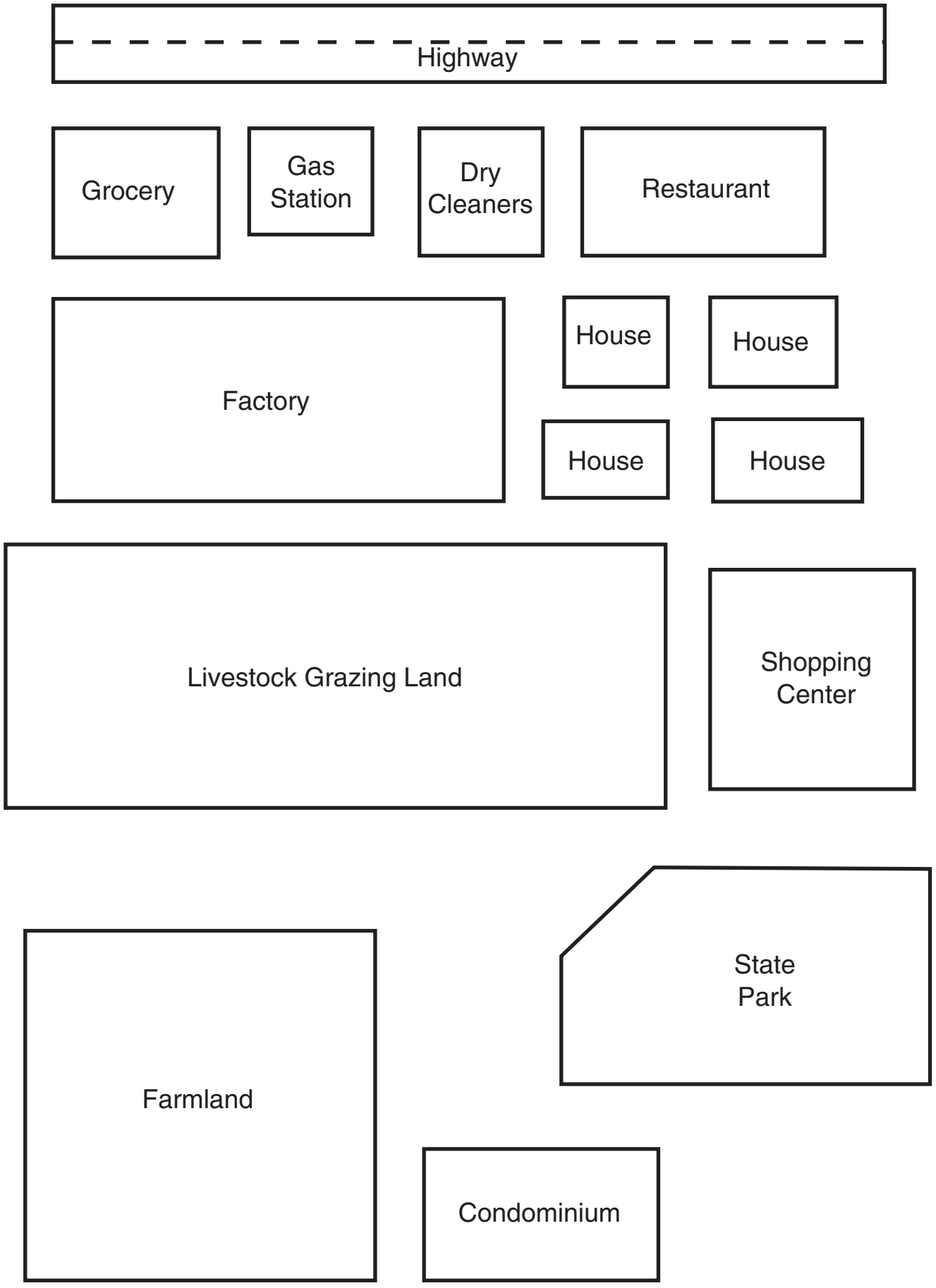
Evaluation:

1) Name three things that people can do to reduce or prevent damage to short grass prairies. Under what conditions, if any, do you think actions to reduce damage to prairie land would be appropriate?

2) Select any action that you personally think would be appropriate, and that you could take, to conserve the short grass prairie ecosystem. Describe what you would do.

THE HAPPY PRAIRIE




Highway
Grocery
Gas Station
Dry Cleaners
Restaurant
Factory
House
House
House
House
Livestock Grazing Land
Shopping Center
State Park
Farmland
Condominium

Suggested for grades 4-12

Surviving as a Black-footed Ferret

(based on Project WILD's Oh Deer!)

Objective:

Students will be able to : 1) Identify and describe food, water, and shelter as three essential components of habitat, 2) describe the importance of good habitat for animals, 3) define "limiting factors" and give examples, 4) recognize that some fluctuations in wildlife populations are natural as ecological systems undergo constant change, 5) introduce students to the many factors that affect this endangered species on the short grass prairie.

Method:

Students become "Black-footed Ferrets" and components of a prairie dog town in a highly involving physical activity.

Background:

A variety of factors affect the ability of wildlife to successfully reproduce and maintain their populations over time. Disease, predator/prey relationships, varying impacts of weather conditions from season to season (e.g., early freezing, heavy snows, flooding, drought), accidents, environmental pollution, and habitat destruction and degradation are among these factors.

Some naturally-caused (droughts) as well as culturally-induced limiting factors (legal hunting) serve to prevent wildlife populations from reproducing in numbers greater than their habitat can support. An excess of such limiting factors, however, leads to threatening, endangering, and possibly eliminating whole species of animals.

The most fundamental of life's necessities for any animal are food, water, shelter, and space in a suitable arrangement. Without these components, animals cannot survive. For many animals on the short grass prairie, these fundamentals of life center around the disappearing prairie dog communities.

This activity is designed for students to learn that:
- good habitat is the key to wildlife survival
- a population will continue to increase in size until some limiting factors are imposed
- limiting factors contribute to fluctuations in wildlife populations, and
- nature is never in "balance," but is constantly changing.

Wildlife populations are not static. They continuously fluctuate in response to a variety of stimulating and limiting factors. We tend to speak of limiting factors as applying to a single species, although one factor may affect many species. Natural limiting factors, or those modeled after factors in natural systems, tend to maintain populations of species at levels within predictable ranges.

This activity is intended to be a simple but powerful way for students to grasp some basic concepts: that everything on the short grass prairie, or any other natural system, is interrelated; that populations of organisms are continuously affected by elements of the environment; and that populations of animals do not stay at the same static number year after year in their environment, but rather are continuously changing in a process of maintaining dynamic equilibria in natural systems.

The major purpose of this activity is for students to understand the importance of suitable habitat as well as factors that may affect wildlife populations in constantly changing ecosystems.

Materials:

Area- either indoors or outdoors- large enough for students to run, e.g., playing field; chalkboard or flow chart; writing materials.

Procedure:

1) Begin by telling students that they are about to participate in an activity that emphasizes the most essential things that animals need in order to survive. Review the essential components of habitat with the students: food, water, shelter, and space in a suitable arrangement. This activity emphasizes food, water, and shelter, but students should not forget the importance of the animals having sufficient space in which to live, and that all the components have to be in a suitable arrangement or the animals will die.

2) Ask your students to count off in fours. Have all the ones go one area; all the twos, threes, and fours go together to another area. Mark two parallel lines on the ground or floor ten to 20 yards apart. Have the ones line up behind one line; the rest of the students line up behind the other line.

3) The ones become "Black-footed Ferrets." All the ferrets need good habitat in order to survive. Ask the students what the essential components of habitat are again: **food, water, shelter, and space in a suitable arrangement.** For the purposes of this activity, we are emphasizing the ferret's need for prairie dogs and the prairie dog town (which provide food, water, and shelter for the ferret) in order to survive. When a ferret is looking for prairie dogs as food, it should clamp its hands over its stomach. When it is looking for water, it holds its hands over its mouth. When it is looking for shelter in the prairie dog town, it holds its hands together over its head. A Black-footed Ferret can choose to look for any one of its needs during each round or segment of the activity; **the ferret cannot, however, change what it is looking for;** e.g., when it sees what is available during the round. It can change what it is looking for in the next round, if it survives.

4) The twos, threes, and fours are prairie dogs (food), water, and tunnels in the prairie dog town (shelter)--components of the habitat. Each student gets to choose at the beginning of each round which component he or she will be during that round. The students depict which component they are in the same way the ferrets show what they are looking for; that is, hands on the stomach for food, etc.

5) The activity starts with all the players lined up on their respective lines (ferrets on one side; habitat components on the other side) - and **with their backs to the students at the other line.**

6) The facilitator or teacher begins the first round by asking all of the students to make their signs-each ferret deciding what it is looking for, each habitat component deciding what it is. Give the students a few moments to get their hands in place-over stomachs, mouths, or over their heads. (As you look at the two lines of students, you will normally see a lot of variety - some students with water, some food, some shelter. As the activity proceeds, sometimes the students confer with each other and all make the same sign. That's okay, although don't encourage it. For example, all the students in habitat might decide to be shelter. That could represent a drought year with no available food or water.) NOTE: If students switching symbols in the middle of the round is a problem, you can avoid that by having stacks of three different tokens, or pieces of colored paper, to represent prairie dogs, water, and the prairie dog town at both the habitat and the ferret's end of the field. At the start of each round, players choose one of the symbols before turning around to face the other group.

7) When you see that the students are ready, count: "one...two...three." At the count of three, each ferret and each habitat component turn and face the opposite group continuing to hold their signs clearly.

8) When the Black-footed Ferrets see the habitat component they need, they run to it. Each ferret must hold the sign of what it is looking for until getting to the habitat component person with the same sign. Each ferret that reaches its necessary habitat component takes the "prairie dog," "water," or "tunnel," back to the ferret side of the line. This is to represent the ferret's successfully meeting its needs, and successfully reproducing as a result. Any ferret that fails to find its food, water, or shelter dies and becomes part of the habitat. That is, in the next round, the ferret that died is a habitat component and so is available as food, water, or shelter to the Black-footed Ferrets who are still alive.

NOTE: When more than one ferret reaches a habitat component, the student who gets there first survives. Habitat components stay in place on their line until a ferret needs them. If no ferret needs a particular habitat component during a round, the habitat component just stays where it is in the habitat. The habitat person can change which component it is from round to round.

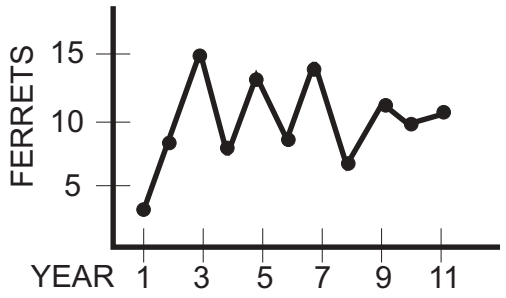
9) You as the facilitator or teacher keep track of how many ferrets are at the beginning of the activity, and at the end of each round. Continue the activity for approximately 15 rounds. Keep the pace brisk and the students will thoroughly enjoy it.

10) At the end of the 15 rounds, gather the students together to discuss the activity. Encourage them to talk about what they experienced and saw. For example, they saw a

small group of ferrets (seven students in a class size of 28) begin by finding more than enough habitat needs. The population of ferrets expand over two or three rounds of the activity until the habitat was depleted and there was not sufficient food, water and shelter for all the ferrets. At that point, ferrets starved or died of thirst or lack of shelter, and they returned as part of the habitat. Such things would happen in nature also.

NOTE: In real life, mammal populations might also experience higher infant mortality and lower reproductive rates.

11) Using a flip chart pad or an available chalkboard, post the data recorded during the activity. The number of ferrets at the beginning of the activity and at the end of each round represent the number of ferrets in a series of years. That is, the beginning of the activity is year one; each round is an additional year. Ferrets can be posted by fives for convenience. For example:



The students will see this visual reminder of what they experienced during the activity: the ferret population fluctuated over a period of years. This is a natural process as long as the factors which limit the population do not become excessive, to the point that the animals cannot successfully reproduce. The wildlife populations will tend to peak, decline, and rebuild-as long as there is good habitat and sufficient numbers of animals to successfully reproduce.

12) In discussion, ask the students to summarize some of the things they have learned from this activity. What do animals need to survive? What are some of the "limiting factors" that affect their survival? Are wildlife populations static, or do they tend to fluctuate, as part of an overall "balance of nature?" Is nature ever really in "balance" or are ecological systems involved in a process of constant change?

Variations:

1) The Black-footed Ferret depends on the prairie dog for both food and shelter. After the students have played several rounds of the activity, introduce predators into the game. Predators of the Black-footed Ferret include the Coyote and Great-horned Owl. The predators start in a designated "predator den" area off to the side. The predators have to skip or hop. This reduces the possibility of violent collisions between ferrets and predators. The predators can only tag ferrets when they are going towards the habitat and are between the habitat and ferret lines. Once a ferret is tagged, the predator escorts the ferret back to the den. The captured ferret becomes an additional predator. Predators that fail to tag someone die and become habitat. That is, in the next round, the predators that died join the habitat line. They will become available to the surviving ferrets as either food, water, or shelter. During each round, the teacher should keep track of the number of predators as well as the numbers of ferrets. Incorporate this data into the graphs.

NOTE: Be sure the students understand that captured ferrets are symbolic of the direct affect of predators on prairie dog populations. (Black footed ferret needs a large contiguous prairie dog town for both food and shelter).

2) Instead of drawing the line graph for students as described in procedure 11, have the students create their own graphs. Provide them with the years and numbers of ferrets. Depending on the age group, they can make picture, line, or bar graphs.