

Create A National Wildlife Refuge

Your group has been assigned by the U.S. Fish and Wildlife Service to design a national wildlife refuge. Acting as a refuge staff, follow the directions on this page. At the end of this exercise, you will share your refuge with other students.

Location and refuge setup:

- Use white string in the packet to show the boundary of the refuge.
- Use blue string to show areas of water.
- Use brown string to show forested areas.
- Use green string for grasslands.
- Use yellow string to show where people are not allowed.
- Use orange string to show where trails would be in the refuge.

Special Sites:

Using the popsicle sticks, show some features of your refuge that make it special. They could be things like types of animals, interesting landforms, or special habitats. On a blank page, draw a map of your refuge setup and its special features.

Visiting other sites:

After the refuge is complete, allow group members to see other refuges. Leave at least one person at you refuge to serve as the refuge manager that guides the visitors.

Remember to switch refuge **managers** so everyone has a chance to look at all the refuges.

Create A National Wildlife Refuge (4-12)

Duration:

1 to 1 ½ hours

Key

Vocabulary

U.S. Fish & Wildlife Service, National Wildlife Refuge, wildlife, habitat, waterfowl, cultural resource, ecosystems, wetlands, and endangered species.

Materials

(For each student group)
field notebooks
pencils
hand lens
one piece of white string
minimum of five pieces of blue string, varying lengths
minimum of five pieces of brown string, varying lengths
minimum of five pieces of green string, varying lengths
minimum of five pieces of yellow string, varying lengths
minimum of five pieces of orange string, varying lengths
10 popsicle sticks and asst. crayons

Objectives

- Younger students (4-6) will:
 - cite 1-2 reasons why National Wildlife Refuges are needed.
 - describe characteristics of a National Wildlife Refuge.
 - contrast the difference between a National Wildlife Refuge and National Park.
- Older students (7-12) will:
 - cite three reasons why National Wildlife Refuges are needed.
 - describe characteristics of a National Wildlife Refuge.
 - contrast the difference between a National Wildlife Refuge and National Park.
 - list three problems facing National Wildlife Refuges.
 - make inferences about the impacts of land use on wildlife refuges.

Method

- Students will:
 - create a mini National Wildlife Refuge in a specified outdoor area, marking public use and habitat characteristics, and providing visitors with information about their refuge.

Background

The National Wildlife Refuge System, overseen by the U.S. Fish & Wildlife Service, is a network of United States lands and waters managed specifically for wildlife. Refuges are vitally important. They provide habitat -- food, water, shelter and space - for over 60 endangered species and hundreds of species of birds, mammals, reptiles, amphibians, fish and plants. The refuge system is made up of over 500 refuges and 92 million acres in 50 states. They range in size from less than one acre (Mille Lacs in Minnesota) to almost 20 million acres (Yukon Delta in Alaska). Small or large, each refuge provides vital habitat for at least a portion of America's wildlife populations.

Set amid mountains and deserts, seashores and lakes, forests and grasslands, the character of refuges is as diverse as the United States itself. Many refuges are located along the major north-south flyways, providing feeding and resting areas for the great semi-annual migrations of ducks, geese and other birds. Others serve as sanctuaries for endangered or unusual species (e.g., the Aransas Refuge in Texas is the winter home of the whooping crane). Some refuges also preserve archaeological artifacts and areas of historical significance, along with wildlife habitat. Turnbull National Wildlife Refuge, located in a unique ecosystem of eastern Washington known as the channeled scablands, has several rock shelters

and provides habitat for migratory waterfowl and numerous other wildlife species. The refuge consists of 15,500 acres of grassland, wetland, and forest habitat, and includes natural geologic sites used by Native Americans for shelter.

On many refuges, lands must be managed by the refuge managers and their staff to increase natural diversity and improve habitat for wildlife. Forests may be thinned, planted, harvested, burned or otherwise managed to benefit wildlife. Grasslands, too, may be managed using periodic burning, grazing or harvesting to maintain optimum vegetative quantity and quality for feeding or nesting waterfowl and a variety of other wildlife. Water is often managed on wildlife refuges using water control structures and dikes that act as dams to insure adequate water levels in wetlands. Water control structures also allow the draining of wetlands, a method used to stimulate the production of native natural foods, and then the reflooding to regain suitable water levels.

The staff at Turnbull National Wildlife Refuge use several management strategies to improve wildlife habitat, including thinning and burning habitat to restore health to the ponderosa pine forest ecosystem, maintaining optimum water levels to best meet the needs of a wide variety of plants and animals, restoring wetlands to benefit waterfowl and other wetland-dependent species, and planting native vegetation to decrease noxious weed invasion and enhance habitat.

It's important to remember that not all refuges are manipulated. Many areas, including Wilderness and Research Natural Areas, are left in a wild or natural state. Turnbull National Wildlife Refuge has a Research Natural Area within the northeast area of its boundaries.

Up to 30 million people visit refuge lands annually. Although public uses are regulated so they do not interfere with the wildlife purposes of the refuge, many activities are available. Recreational uses may include wildlife observation, photography, hiking, boating, nature study, hunting and fishing. Some refuges provide visitor centers, special study areas, interpretive trails and drives, wildlife observation towers, photographic blinds, and other public facilities.

Activities vary with each refuge and may depend on the season of the year. Turnbull National Wildlife Refuge offers wildlife observation, hiking trails, an auto tour route, and environmental education classroom and activities in a 2200-acre public use area. The remaining 13,300 acres are closed to the public for the benefit of wildlife. Recreational activities such as hunting, fishing and boating are not allowed at Turnbull National Wildlife Refuge.

National Wildlife Refuges face daily challenges, which may include problems specific to their location. For example, because a refuge may resemble an *island* surrounded by development and other land use practices, it may experience a combination of problems: water quality and quantity, noxious weed invasion, noise and air pollution, and the list goes on. Turnbull National Wildlife Refuge faces similar concerns, especially regarding water quality/quantity and other problems that result from urban growth.

Upon arriving at a National Wildlife Refuge, the visitors may or may not have to pay a small entrance fee. Turnbull National Wildlife Refuge requires a \$3.00 entrance fee from visitors, March through October. Schools participating in educational activities are given an entrance fee waiver.

One part of a refuge employee's job is to provide visitors with information regarding the refuge resources. Information about the refuge is also provided to visitors via pamphlets and signs. Remember that National Wildlife Refuges belong to everyone, and it is everyone's responsibility to learn about these valuable natural resources and how to conserve and protect them.

How do National Wildlife Refuges differ from National Parks? First and foremost, the original intent of setting aside lands as National Wildlife Refuges is for the sole purpose of managing these lands for wildlife. All other activities that occur on refuges, therefore, must be compatible with the management goals for wildlife on those refuges. National Parks, in contrast, have been set aside to preserve and protect the best of our natural, recreational, and cultural resources for the use of all persons. In other words, on refuges wildlife comes first, and in parks people come first.

Procedure

- Discuss the concept of National Wildlife Refuges with your students. Ask the students if they have ever been to a National Wildlife Refuge. Ask older students what makes a National Wildlife Refuge different from a National Park.
- Ask students what they would like in a National Wildlife Refuge, if they were to create a "perfect refuge." Why set aside a National Wildlife Refuge? Who owns National Wildlife Refuges?
- Break students out into groups of four or five. Distribute the materials listed on the preceding page to each group of students.
- Assign each group to a location at the refuge environmental education site. Using the long white nylon string, they should rope off their area in any shape they desire.
- Students must move around in their National Wildlife Refuge on hands and knees. Using a hand lens (optional), the students choose unique habitat areas of their refuge; a hole might be a canyon, a rock might be a mountain or cliff. The popsicle sticks can be used to mark trails, tour routes, and observation areas within the public use area; colored strings can be used to delineate forest, grassland and wetland areas.
- String uses:
 - White: refuge boundary
 - Blue: water, lakes, ponds, streams, marshes, etc.
 - Brown: forests
 - Green: grasslands
 - Yellow: areas people are allowed
 - Orange: trails or roads
 - Black: (only in a few kits) farm land

- Give the class about 30 minutes to set up their refuges. After the students have marked their refuges they must complete their worksheet, which may include drawing a map of their refuge for some age groups.
- Once students have drawn their map, they must visit other groups' refuges. All the groups move from refuge to refuge and the students take turns explaining what they created and why. Another option is to have one student from each group remain at the refuge while other students move about looking at the different refuges. This person acts as the refuge manager who greets incoming visitors and explains the benefits and management of the refuge. The students should switch off so every student has a chance to act as the refuge manager and to visit at least one other National Wildlife Refuge.
- After they have visited the National Wildlife Refuges, the students should discuss the following questions: How did other refuges differ from your refuge? What problems did the refuge manager experience at his or her refuge? What unusual habitat or wildlife occurs at yours or others' refuges? For older students, how would you convince a congressional group to support your refuge? And how would you raise money for your refuge, given how you have designed the facility?

Extensions

- Younger students can create a brochure using the information from their worksheets. The brochure should include a detailed map of the National Wildlife Refuge and its features
- Older students - write a letter to congress proposing that they fund your National Wildlife Refuge. Why is the refuge important? What unique features does it possess? What will happen to the land if it is not protected as a National Wildlife Refuge?
- Find out about other organizations, including private groups, and local, county and state agencies that work to protect wildlife and their habitat. What do they do and how do they do it?

Evaluation

- Name a minimum of two reasons for having National Wildlife Refuges.
- What can you do to help protect the resources on a National Wildlife Refuge?
- Who has the responsibility of preserving and protecting the refuge for future generations? What is the difference between a National Wildlife Refuge and a National Park?

REFUGE CARD #1

Major Ecosystem:

- * Mountainous forested area interspersed with grasslands encompassing approximately 41,000 acres, elevations from 2,200 to 6,000 feet.

Water Source:

- * Two small lakes and many miles of mountain streams.

Primary Wildlife:

- * Large mammals, including white-tailed deer, mule deer, elk, and black bear.
- * Wide variety of bird life, principally upland (grouse and quail) and forest birds (thrush and flycatcher).

Surrounding Land Use:

- * Mostly national forest land; some privately owned forest.

Potential Recreation and Education Activities:

Approximately 80% of the refuge is open to public use.

- * Wildlife observation, study, and photography.
- * Fishing for rainbow, cutthroat and eastern brown trout.
- * Seasonal hunting for big game and upland birds.
- * Camping, hiking, and horseback riding.

Special Note:

- * High demand for recreational activities at this refuge.
- * Scattered tracts cultivated for hay production lie within the refuge.
***Use black yarn to mark these areas in your refuge.
- * Increasing timber harvest along refuge boundary.

REFUGE CARD #2

Major Ecosystem:

- * 4,627 acres of flat floodplain. Habitats within the floodplain include marshes, lakes, forest lands, and grasslands.

Water Source:

- * Columbia River

Primary Wildlife:

- * Resting and wintering area for Canada geese, tundra swans and ducks, primarily widgeon, mallards and pintail.
- * Sandhill cranes are fall and spring migrants.
- * Wide variety of habitats supports a diversity of waterbirds, birds of prey, shore and songbirds.

Surrounding Land Use:

- * Mostly privately owned agricultural land.
- * Southern refuge boundary adjoins a small town (population 5,000).

Potential Recreation and Education Activities:

Approximately 50% of the refuge is open to public use.

- * Wildlife observation, study, and photography.
- * Self-guided interpretive trail.
- * Environmental education and teacher assistance.
- * Waterfowl hunting and limited fishing.

Special Note:

- * High demand for waterfowl hunting at this refuge.
- * Some wetland areas within the refuge are diked and farmed to produce wildlife food.

***Use black yarn to mark these farmed areas on your refuge.

REFUGE CARD #3

Major Ecosystem:

- * 39,116 acres of open water, marshes, forest lands and croplands.

Water Source:

- * Large lake system

Primary Wildlife:

- * Peak of nearly one million waterfowl use the area during fall migration.
- * Large summer populations of herons, egrets, grebes, terns, and gulls.
- * Largest wintering concentration of bald eagles (500) in the lower 48 states.

Surrounding Land Use:

- * Mostly privately owned agricultural land.
- * Northern refuge boundary is also a state border.

Potential Recreation and Education Activities:

Approximately 30% of the refuge is open to public use.

- * Wildlife observation, study, and photography.
- * Auto tour route.
- * Visitor center at headquarters.
- * Waterfowl and pheasant hunting.

Special Note:

- * A threatened species, the bald eagle, uses the refuge seasonally.
 - * 2,000 acres of crops are planted as buffer strips around some of the wetland areas to provide food and cover for wildlife, and to reduce waterfowl use of adjacent agricultural lands.
- ***Use black yarn to mark these farmed areas on your refuge.

REFUGE CARD #4

Major Ecosystem:

- * 5,992 acres of native valley grassland with scattered wetland habitat.

Water Source:

- * Seasonally flooded lands.

Primary Wildlife:

- * Wintering area for migratory waterfowl.
- * Refuge provides habitat for endangered kit fox and blunt-nosed leopard lizard.

Surrounding Land Use:

- * Mostly agricultural land owned by corporations.
- * Refuge is within 6 miles of a city (population 55,000).

Potential Recreation and Education Activities:

The refuge is open to public use only by special arrangement.

- * Wildlife observation, study, and photography.

Special Note:

- * Two endangered species are protected on the refuge, therefore recreational uses are greatly limited.
- * Nearby city is heavily supported by industry, primarily canning factories.

REFUGE CARD #5

Major Ecosystem:

- * 631 acres of sand spit (long sand bar), tidelands, and forested upland habitat.

Water Source:

- * Pacific Ocean

Primary Wildlife:

- * Key wintering and spring gathering area for waterfowl.
- * Calmer bay waters provide outstanding habitat for shorebirds.
- * Occasional marine mammals, including killer whales and harbor seals are seen.

Surrounding Land Use:

- * National recreation area, which provides camping and fishing, is adjacent to the refuge.

Potential Recreation and Education Activities:

100% of the refuge is open to public use during daylight hours.

- * Wildlife observation, study, and photography.
- * Beachcombing.
- * Nature Exhibits.

Special Note:

- * Entrance fee of \$2.00 per family.
- * Public access to the refuge is by foot or horseback only.
- * The refuge protects one of the longest natural spits in the world.

REFUGE CARD #6

Major Ecosystem:

- * 15,500 acres of wetland, interspersed with forest habitat.

Water Source:

- * Lake system and streams.

Primary Wildlife:

- * As many as 50,000 ducks, geese and other migratory birds use the area in the spring and fall. Many species of waterfowl use the refuge habitat for nesting and raising their young.
- * Numerous mammals, including deer, elk, coyotes, beaver, badger, muskrats and mink are found here.

Surrounding Land Use:

- * The refuge is located just one mile south of a city (population 8,000), and ~20 miles southwest of a larger urban center (population 90,000).
- * Agricultural and forest land, privately owned, borders the eastern boundary of the refuge.

Potential Recreation and Education Activities:

15% of the refuge is open to public use during daylight hours.

- * Wildlife observation, study, and photography.
- * Environmental education activities and classroom (at headquarters).
- * Auto tour route.
- * Hiking trails and observation points.

Special Note:

- * Entrance fee of \$3.00 per vehicle, seasonally March 1 - October 31.
- * Seasonal wetlands here support a threatened aquatic plant.
- * Urban development, including residential sub-divisions and light industry, is beginning to encroach on the refuge's boundary.

CREATE A REFUGE

DESCRIBE THE LOCATION OF YOUR REFUGE:

WHAT ARE SOME EXAMPLES OF WILDLIFE THAT ARE FOUND AT THE REFUGE?

WHAT IS THE NAME OF YOUR REFUGE?

WHAT IS THE MAIN PURPOSE FOR ESTABLISHING THIS REFUGE?

ARE THERE ANY POTENTIAL PROBLEMS WITH THE DESIGN OF THIS REFUGE?

LIST THREE POSSIBLE BENEFITS OF THE DESIGN OF YOUR REFUGE:

CREATE A REFUGE

DRAW OR SKETCH A MAP OF YOUR REFUGE
(please label):

CREATE A NATIONAL WILDLIFE REFUGE

Name of refuge _____

Location of refuge _____

What surrounds the refuge? _____

Animals and plants using the refuge _____

Are visitors allowed? _____ Is there a cost? _____

What can visitors do on the refuge? _____

What major problem(s) does the refuge face? _____

How does the refuge deal with the problem? _____

CREATE A REFUGE

WHITE: REFUGE BOUNDARY
BLUE: WATER
GREEN: FOREST
BROWN: GRASSLAND
ORANGE: TRAILS AND ROADS
YELLOW: PUBLIC USE BOUNDARIES
BLACK: AGRICULTURAL

CREATE A REFUGE

WHITE: REFUGE BOUNDARY
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Create a National Wildlife Refuge

Secondary Student Worksheet

Goal

Your group has been assigned by the Fish and Wildlife Service to design a new national wildlife refuge. Acting as refuge staff, follow and complete the following worksheets. Your group must take into consideration bordering land uses, water sources, and wildlife considerations outlined for you on your refuge card. At the end of this exercise you will present your design to a Fish and Wildlife Service Director for review.

Procedure

1. Location

- Read the card located in your pack to learn background information about your refuge. Always consider this information as you design your perfect refuge.
- Your group should choose an area at the environmental education site to represent the "major ecosystem" on your refuge card. This is the general location of your refuge.
- What general area in the United States could your refuge be in?

Location: _____

2. Refuge Boundary

- Choose where you will place the refuge boundaries within your general location, while thinking about the following...
 - Topography of the area. Note areas of higher and lower elevation and other special physical characteristics.
 - Choose unique habitat areas of your refuge: a hole might be a canyon, a rock might be a mountain or cliff.
 - Wildlife refuges come in many shapes and sizes.
- Use the white rope to show the area that will be your wildlife refuge.

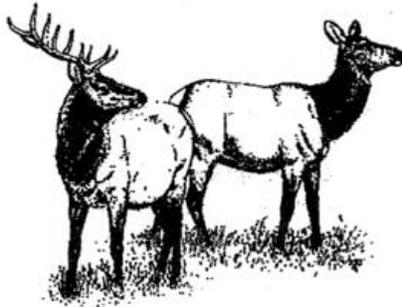
3. Water sources

- Using the types of water sources provided on your refuge card and the topography of the land, decide where the water sources of your refuge will be located.
 - At least one water source should cross a refuge boundary.
 - Use the blue string to represent the bodies of water and any streams or rivers on your refuge.

4. Other wildlife and habitat types

- Look at the examples of wildlife that might be found in your refuge.
- List other wildlife, real or imaginary, that might be present in your refuge.

- Wildlife needs a diversity of habitat types.
- Use the green string to show areas of grassland habitat.
- Grasslands are usually located near water.
- Use the brown string to show areas of forest land habitat.



5. Refuge name and purpose for the establishment?

- What will the name of your refuge be?

_____ National Wildlife Refuge

- What is the primary purpose for which the refuge is being established? It may be to provide habitat for an endangered species, habitat for migratory or wintering birds, waterfowl production (nesting and rearing young), marine wildlife (mammals, birds, etc.), big game (deer, elk, moose) or anything you decide upon. Make sure you use your refuge card as a reference.

6. Public Use

- The public use area of your refuge, if appropriate, should be an area which offers a wide variety of habitat types with the least impact on wildlife.
- Consider your refuge card, then use the yellow string to separate the public use area from the closed area of the refuge.
- Which public use activities will be allowed at your wildlife refuge?
 - ___ closed/wilderness area ___ wildlife observation ___ hunting
 - ___ protected wildlife area ___ cultural resource site ___ fishing
 - ___ entrance fee charges ___ habitat management ___ grazing
 - ___ photography ___ hiking ___ boating
 - ___ other
- What factors did you consider in the placement of the public use area?

- Taking into consideration the public use activities on your refuge, the topography within your chosen boundaries, and your public use area, use orange strings to mark where the trails will be.

7. Problems and benefits:

- Looking at your refuge, the bordering land uses, the water sources and wildlife considerations, name at least three...
-potential problems with the refuge, design, or unique/controversial issues facing your refuge.

List three potential benefits of refuge design.
