



# FORESTS ON THE EDGE

## FIELD      ACTIVITY

### **OUTCOMES:**

1. Increase student appreciation for the value of conserving, supporting, and sustaining forests.
2. Reinforce outcomes from in-class activities.
3. Increase understanding of multiple-use managed forests.

**GRADE LEVEL:** 5th-8th

**TIME:** 3 hours

### **MATERIALS:**

#### **ITEMS PROVIDED BY GREENWAY TRUST:**

- Track scarf, scat scarf, rubber scat (e.g. coyote, bat, deer), Tiger/Cougar/Squak Mountains map, Animal id. cards
- 4 backpacks which each include:  
3 clipboards with a plastic sheet, Forest Exploration Walk Worksheet, plant i.d. cards, Forest Transect Worksheet (different for each clipboard)
- Forest Transect Bag with: soil augur, 10 meter transect string
- Pencils
- Tiger Mountain map
- Western Forests book
- Jeweler's Loupe Kit with: at least 8 loupes, paper bag with forest objects, at least 8 worksheets

**LOCATION:** Tiger Mountain State Forest, High Point parking area.

**OUTLINE:** *(Adapt language and questions up or down depending on grade level.)*

### **I. WELCOME ON BUS**

- A. Meet group in parking lot and board bus. Welcome students and parents to Tiger Mountain and tell them to bring: warm clothes, raingear, drinks and food. Explain that we will be out on the trail for 2.5 to 3 hours and they will need all the items just mentioned. They will have a chance to eat snacks and lunch on the trail.
- B. This is the last chance to use bathrooms until we return for lunch.
- C. Ask students to follow you to the bathrooms and then meet at the Interpretive Shelter.

### **II. GATHER IN THE INTERPRETIVE SHELTER**

- A. Introduce Tiger Mountain State Forest and activities for the day. Explain that students will do two activities, a forest exploration walk and a forest transect study. Through these activities, they will gather information that will help them determine which of the Land Use Goals discussed in class are appropriate for this site.

- B. Discuss "Trail Etiquette": Ask students if they know some of the "do's" and "don'ts" of hiking on forest trails (make sure the following are included: stay on the trail and within sight of your chaperone; respect plants by not stepping on or trampling anything; respect animals by not disturbing them; respect each other by not throwing anything or hitting each other; be safe by not running on trails; respect others and wildlife by not littering).

### III. FOREST EXPLORATION WALK

- A. Divide class into four groups. Assign one parent chaperone to each group, and give each group a backpack. Direct groups to find the three clipboards in their packs and distribute among group members, so that every two-three students have one. Have students find the Forest Exploration Guide at the front of their clipboards, and explain how to use worksheet:

1. The Exploration Walk is like a scavenger hunt. Each team of two-three students with a clipboard should work together to look for the interpretive signs and other objects listed in bold on your worksheet next to the numbered stops, and to answer the questions at each station. I will stagger each of the four chaperoned groups, so that one group leaves every five minutes (that way you won't all be on top of each other on the trail). I'll take each group to the trailhead and point out the correct trail and the first stop.

2. We're taking the "Around the Lake Trail," which is highlighted in yellow on the Tiger Mt. map in the front pocket of your backpacks; we're starting where the "P" for parking lot is marked.

3. In addition to worksheets, you'll also find plant i.d. cards on your clipboards that you can use in the forest, as well as a forest field guide in your backpacks. Pencils are in the front pocket of your pack.

- B. Tell students: as you walk, also look for clues that tell you what the primary Land Use Goal/s are for this forest.
- C. Have each group take a few minutes to read through the stops on their worksheets, so they know what they're looking for.
- D. When they're ready, stagger groups' start times by five minutes. Give a handheld radio to the chaperones leading the first and last groups.
- E. Waiting groups can: 1) read through their Forest Exploration Guide, 2) practice tree and plant identification using the plant cards on their clipboards, 3) begin the jeweler's loupe activity found in the Jeweler's Loupe Kit in their backpacks.

### IV. AT THE APPOINTED LUNCH SPOT

(try to walk ahead to get there first)

- A. Give groups a five-ten minute rest and snack break as they arrive.
- B. Lay out the track and scat scarves and the rubber scat for students to look at while they eat/wait.
- C. Also, while they are waiting for all the groups to return, have them do the worksheet in the Jeweler's Loupe Kit.

### V. DISCUSSION

- A. When all of the groups are back and have had a snack/lunch, gather the class together, and ask students to share what they observed during their walk.

Ask:

1. *Did you see any evidence of wildlife that might live in this forest?*
2. *What do you think the primary Land Use Goal or goals are for this forest? (Don't confirm answer at this stage.)*
3. *In what ways do you think people and wildlife share this forest?*
4. Review land use "compatibility" from class.

## VI. TRANSECT STUDY

- A. Transition: Remember the piece of land that was for sale in class? Let's say this is that piece of land, and I am still the owner. Because the benefits of the land use goals you presented to me in class were all so important, I am now hiring you as a team of forest scientists to study this forest more closely. I want you to tell me which Land Use Goal or goals will be most appropriate for this forest. How can we find that information?
- B. If we want to study a forest and learn all we can about it, we start gathering information with our senses, just as you have. We look and listen to get a better sense for what is in the forest. Do you think a forest manager would want to know more about this forest than just what the senses can tell? Why? What else would they want to know? How would they gather the information?
- C. Explain that while our senses can tell us a lot about the forest ecosystem, scientists who study the forest use tools and maps to give them more detailed information. They can use this information to learn how sensitive particular sites are (in terms of soil type, plant and animal species present, etc.), and then they can

decide what land use options are appropriate for each site.

- D. One way to look more closely at a forest is to do a "transect" study. A transect is a line of string that we will spread out in the forest. It represents a sample of the larger forest that we will examine very closely. We examine a small sample of the forest closely, because it would be too time-consuming to study the entire forest closely. Scientists studying this forest would take multiple samples throughout the forest, but today each group will just look at one transect to give you an idea of how it's done.
- E. Tell students they will work in the same four chaperoned groups they hiked with, and each group will also work in the same teams of two-three students with clipboards.
- F. Ask groups to find their Forest Transect Worksheets on their clipboards and the Forest Transect bag in their backpacks; explain how to use:
1. Each team of two-three students with a clipboard has a different worksheet, because each team in a group will complete a different part of the transect study.
  2. Each group should set up one transect line in the forest (I will show you where), then answer the questions on your worksheet.
  3. Note that: the "Research Question" team in each group will not be collecting data from the transect, but instead they'll be using the data collected by the Plant, Animal and Soil teams to answer the Research Question (read question aloud to class).
- G. Ask for some volunteers to help lay out a sample transect and demonstrate how to use the soil augur.

- H. Stagger groups along trail (stay fairly near the trailhead, though), and instruct them to lay out their transect lines parallel to the trail, far enough into the forest, so they get a good sampling of trees, but close enough to the trail, so they can work on the trail without trampling forest plants.
- I. After the students finish collecting data, gather again as a group and share their answers to the Research Question.
- J. Ask the class if they enjoyed being in the forest. Indicate that we often take it for granted that visiting a place like this is always available to us and at no cost. But what if this opportunity wasn't free? We pay to go to the movies, amusement parks, and museums. How much is this opportunity worth? As our forests become scarcer, we may need to consider this more.

## VII. WRAP-UP

- A. Describe "forest management" and the mission of the Natural Resources Conservation Area (wildlife habitat protection) in terms of primary land use goals. What other land uses are compatible with this mission?
- B. How do we sustain forestlands in the

long run if we have multiple goals for using these forests?

- C. Show map of Tiger Mt., and show how DNR has divided land uses across the forest. (The NRCA is managed primarily for wildlife protection, and secondly for recreation. Other areas of Tiger Mountain are managed primarily for recreation and/or timber harvesting.) Review the Greenway Trust, and explain how Tiger Mt. is one piece of the Greenway. Other pieces have different land use goals. Some have multiple goals, like timber harvesting and recreation, some areas are being developed, some areas, like this one, are preserved to protect wildlife habitat, while still allowing people to hike. The key idea of the Greenway is to balance land use goals over a wide area, so that we will always have forests, both to preserve and to use.
- D. Ask: *Does anyone have any last questions? Any things you are still wondering about after your visit to the forest today?*

# LAND USE GOAL SHEET

**WILDLIFE HABITAT PROTECTION** - The forest should be protected for wildlife if:



- ◆ The plants in the forest form at least three layers (forest floor, understory, canopy). Multiple layers provide a “diversity” (many different kinds) of wildlife habitats.
- ◆ There are a mix of evergreen (keep their leaves year-round) and deciduous (lose their leaves in the winter) trees, which also provide a diversity of habitats.
- ◆ There are streams and wetlands nearby that provide specialized habitat for animals who depend on water.

**WATER QUALITY PROTECTION** - The forest should be preserved to protect water quality if:



- ◆ There are streams in the forest. Salmon or other fish live in these streams, wildlife drink from or find food in them, and frogs and salamanders lay their eggs in them.
- ◆ The forest is near a city. Urban citizens depend on forests for their clean drinking water.

**AIR QUALITY PROTECTION** - The forest should be preserved to protect air quality if:



- ◆ The forest is near a city. Trees help buffer the effects of air pollution caused by car exhaust.

(SEE OTHER SIDE)

RECREATION - The forest should be used for recreation if:



- ◆ The soil is stable enough to build trails on:
  - Soils should not be mostly sand because they will erode and wash away too easily.
  - Soils should not be mostly clay because they will be too slippery to walk or ride on, and they do not drain water well, so they flood easily.
  - Soils should be a clumpy mix of sand, clay, and organic matter (decaying leaves, etc.).
- ◆ There are interesting things for people to see and learn in the forest

TIMBER HARVESTING - The forest should be used for timber harvesting if:



- ◆ The trees are plentiful and certain areas can be selectively harvested and replanted.
- ◆ The options for keeping the land forested have long-term benefits (for a stronger economy and healthier environment.) Washington's climate helps Douglas-fir and Hemlock trees grow better here than other places in the world. They grow quickly and are ideal lumber for homes and other buildings.

DEVELOPMENT - The forest should be developed if:



- ◆ The soil is stable enough to build on:
  - The soil should not be mostly clay, because rainwater will not drain into it, so the land will flood easily.
  - The development site should not be on a steep hill because soil on steep hillsides can break loose and slide downhill during heavy rain.
- ◆ The forest is connected to a planned urban zone, with the need for new homes, businesses or schools, etc. in this area.

# FOREST EXPLORATION WALK WORKSHEET -

AROUND THE LAKE TRAIL, TIGER MOUNTAIN

*Please stop at the following points of interest along the trail with your group, and follow the instructions listed below.*

## **STOP 1** Interpretive sign: “Tales of Tradition Plateau”



- ◆ Read sign.
- ◆ Find the ‘Around the Lake Trail’ on the map.
- ◆ Find a sword fern.

Between stops, be aware of and note the following (you can stop and answer these questions if you are waiting for another group in front of you to leave a stop):

- ◆ What do you hear?
- ◆ What do you see?
- ◆ What signs can you find that tell you what animals live in this forest?
- ◆ What signs tell you how people use this forest?

## **STOP 2** Find a tree that has been cut alongside the trail.

*(You will see logs lying along the trail in several places.)*



- ◆ Why do you think this tree was cut down?
- ◆ How old was this tree when it was cut? (Hint: Count the growth rings. One light-colored ring + one dark colored ring = one year of growth.)
- ◆ What do trees need to grow?

(SEE OTHER SIDE)

### STOP 3

**Interpretive sign: “Downhill Run to Tradition Lake”**  
*(just before bridge over creekbed)*



- ◆ Read sign.
- ◆ Look at the trees growing at this site. Are they mostly “evergreen” (keep their needles or leaves all year round) or “deciduous” (lose their leaves in the fall and winter)?

### STOP 4

**Interpretive sign: “What’s Tradition Lake up To?”**

- ◆ Read sign.
- ◆ Look at the trees growing at this site. Are they mostly “evergreen” (keep their needles or leaves all year round) or “deciduous” (lose their leaves in the fall and winter)?

### STOP 5

**Interpretive sign: “Keeping Our Distance”**



- ◆ Read sign.
- ◆ Who or what lives down by the lake?
- ◆ Why was the trail moved away from the lake’s shore in 1992?

### STOP 6

**Cedar tree with hollowed trunk**

- ◆ Why do you think this tree is hollow?
- ◆ Look around you; can you find other signs of the event that hollowed the cedar?

### STOP 7

**Overtured tree with “root ball”**

- ◆ What might have caused a tree to fall over and uproot like this?
- ◆ What does the unearthed soil clinging to the tree roots look like? (Light, dark, rocky, not rocky?)

*Meet the group in the picnic area located beside the lake. Look for the large cedar trees and benches to identify this spot. If you get to the powerline road you’ve gone too far!*

# FOREST TRANSECT WORKSHEET

Names: \_\_\_\_\_ Date: \_\_\_\_\_

## PLANTS

TASK/QUESTION	ANSWER
<p><b><u>PLANTS: FOREST FLOOR</u></b></p> <p>◆ How many different plant species can you find on the forest floor (small plants that grow low to the ground, like grass, ferns, etc.) along your transect line?</p> <p><b><u>PLANTS: UNDERSTORY</u></b></p> <p>◆ How many different plant species can you find growing in the understory (shrubs or bushes and small trees) along your transect line?</p> <p><b><u>PLANTS: CANOPY (TALLEST TREES)</u></b></p> <p>◆ Identify the dominant (most common) tree species in or around your transect.</p> <p>◆ Are the trees along or around your transect primarily evergreen (keep their leaves all year) or deciduous (lose their leaves in the fall) trees or a mix of both?</p>	

- ◆ Which goals would protect **plants**?
  - Wildlife Habitat Protection     Water Quality Protection
  - Air Quality Protection     Recreation     Timber Harvesting     Development
  
- ◆ Now go to the **Land Use Goal Sheet** and review the information in order to answer the **Research Question**.

# FOREST TRANSECT WORKSHEET

Names: \_\_\_\_\_ Date: \_\_\_\_\_

## SOIL

TASK/QUESTION	ANSWER
<ul style="list-style-type: none"> <li>◆ Take a soil core sample along your transect. (To get a good sampling, make sure you do not take it from the trail).</li>   <li>◆ Is your soil light or dark in color?</li>   <li>◆ Pinch some between your thumb and forefinger and rub it around. Does it feel smooth or gritty?</li>   <li>◆ Does it stick together when you press it together?</li>   <li>◆ Is it wet or dry?</li>   <li>◆ Do you think your soil is made up mostly of clay (very fine soil which is sticky) or sand (larger particles that don't stick together easily)?</li> </ul>	

◆ Which goals would protect the **soil**?

- Wildlife Habitat Protection     Water Quality Protection  
 Air Quality Protection     Recreation     Timber Harvesting     Development

◆ Now go to the **Land Use Goal Sheet** and review the information in order to answer the **Research Question**.

# FOREST TRANSECT WORKSHEET

Names: \_\_\_\_\_ Date: \_\_\_\_\_

## WILDLIFE

◆ Explore along your transect line and look at the surrounding trees for evidence of animals (birds, insects, reptiles, mammals). Record what evidence you find of any animals living in the area. List animals you think might live here.

◆ Compare your list of animals to a **list** prepared by **field biologists** who studied this area in 1997. Fill in the chart below.

List 3 animals you are curious about from the Field Biologist's List.	Read the information on the cards of the animals you picked. What evidence can you find that makes you think this animal might still live in this area?
1.	
2.	
3.	

◆ Which goals would protect the **wildlife**?

- Wildlife Habitat Protection     Water Quality Protection  
 Air Quality Protection     Recreation     Timber Harvesting     Development

◆ Now go to the **Land Use Goal Sheet** and review the information in order to answer the **Research Question**.

# FIELD BIOLOGIST'S LIST FOR TIGER MOUNTAIN

## **Partial list of animals found at Tiger Mountain:**

Black Tailed Deer

Mountain Lion

Black Bear

Porcupine

Banana Slug

Yellow Spotted Millipede

Pileated Woodpecker

Crows

Pacific Treefrog

Raccoon

# FOREST TRANSECT WORKSHEET

Names: \_\_\_\_\_

Date: \_\_\_\_\_

## **Directions:**

- 1) Read the **Land Use Goal Sheet**.
- 2) Compare the information on the Land Use Goal Sheet with the data collected on the transect line by the **Plants, Wildlife** and **Soils** teams in your group.
- 3) Use the information listed above to answer the Research Question below:

## RESEARCH QUESTION

Based on the information you have collected in this transect study, the things observed along your hike, and the information on the **Land Use Goal Sheet**, which Land Use Goal(s) would you recommend for this forest?

Why did you choose this goal or goals?