Standard: Biology 6a

Academic Target:

Wondering about Wood Thrushes

(based on *Changing the Land* from Project Wild)

Neotropical Migratory Birds

Almost 70 percent of the world's bird species are declining in population. Many birds are on the endangered, threatened, or watch lists in different states and countries. The rapid decline in the species of birds worldwide signals that the ecology of the planet is changing. What are the major threats to birds worldwide? What are people doing to try to protect them?

You will complete a simulation that focuses on certain types of neotropical migratory birds. These birds breed and spend summers in the United States or Canada and then travel great distances to their wintering grounds in Central or South America. The majority of the approximately 200 species of neotropical migratory birds are songbirds.

The life cycles of these migratory birds are very complex. To understand the population changes of these birds, you must consider the breeding grounds in the north, the wintering areas in the south, and the migration path. Below are some of the major threats facing neotropical migratory birds:

- habitat fragmentation
- nest predation
- cowbird parasitism
- urbanization
- linear development (i.e., roads, pipelines and high tower lines)
- loss of habitat – summer, winter, and stopover habitat

You will investigate how forest fragmentation might affect populations of interior forest migratory birds. Forest fragmentation is the reduction of extensive, contiguous forest into smaller, isolated parcels separated by roads, fields, houses, and other development.

Studies by the United States Fish and Wildlife Service have shown that many forest bird species are rare or absent from many small isolated habitat blocks of forest. It is difficult to determine an exact size of territory needed in acres because minimum area estimates vary by species, regions, and habitat types. Despite these difficulties, general patterns of species of birds are emerging. Some bird species are not sensitive to habitat fragmentation and occur in habitat patches of all sizes, whereas others are moderately or highly sensitive and rarely occur in small forested areas. Listed below are samples of each:

Moderate of High Sensitivity	***Low Sensitivity***
Ovenbird	Red-headed woodpecker
Acadian flycatcher	Northern cardinal
Scarlet tanager	Indigo bunting
Wood thrush	Black-capped chickadee
	Bluejay

Wildlife research now shows that many species of forest birds require large blocks of habitat on the edge of built communities and do not nest successfully near edges. Populations of these

species generally do poorly in areas where habitat is broken, or fragmented into small, isolated blocks.

You will now look at two different scenarios for changes to a forested area and the effects of fragmentation on a wood thrush population.

Procedure

1. Form groups as instructed.
2. As a group, read and discuss the above material on Neotropical Migratory Birds as a group.
3. After all group members participated in the discussion, come to consensus **answers for questions A-D.**
4. Now, get one copy of the Student Reference Sheet for your group. Also pick up one "circle-maker."
5. Read the information on the top of the sheet. **Answer question E.**
6. One circle the size of the circle-maker you obtained represents the relative amount of space one nesting pair of Wood Thrushes need for successful breeding. Carefully draw circles on your map until all available nesting area in **Wood Thrush Creek: Present** is covered, but no circles overlap or go outside the box outline. Circles may touch or cross the creek. **Answer question F.**
7. Obtain a copy of **Wood Thrush Creek Scenario: A** for your group. Read it and **answer questions G-I**. FYI: *Logged Area-Select Cut* means some trees were cut from the forest (they were *selected*) and others were not, so there are still some trees in this area.
8. Now draw circles on the 10-year map to show how many nesting pairs are possible. ***However, this time, besides no overlapping and no going outside the box, your circles cannot touch any line representing human made structures.*** The circles can touch the creek. **Answer questions J-K.**
9. Draw circles on the 20-year map to show how many nesting pairs are possible. Same rules: ***no overlapping, no going outside the box, and your circles cannot touch any line representing human made structures***. The circles can touch the creek. **Answer questions L-M.**
10. After your group is finished with Scenario: A, get a copy of **Wood Thrush Creek Scenario: B** for your group.

For the next two steps, you can't just put stuff on the map "wherever." Wood Thrush Scenario A is the official 10- and 20-year plans for the area. Wood Thrush Scenario B is YOUR GROUP'S 10- and 20-year plans for the area. **Your plans must be functional for *both* humans and wood thrushes!** You should want to live in this area, if people followed your plan.

11. For the 10-year in the future map, decide where to put 5 houses, "16.5" cm of paved roads, and "1" cm^2 of forested area on your map. Your job is TO MAXIMIZE THE

AMOUNT OF VIABLE NESTING AREA FOR THE WOOD THRUSH (fit the most *legal* circles on your map!). **Answer questions N-P.**

12. **Copy your 10-year plan on to the 20-year in the future map**. Then **add**: 3 more houses, “5” cm of paved road, and one 10cm long ATM trail. Again, the goal is to keep as much functional Wood Thrush nesting habitat as possible. **Answer questions Q-S.**

Questions

A. What does it mean to be a *neotropical* bird?

B. What is the major difference between a *Moderate or High Sensitivity* bird and a *Low Sensitivity* bird in relation to size of available habitat?

C. Which of the listed major threats to neotropical birds is the greatest? Explain.

D. How do human buildings effect Moderate or High Sensitivity birds?

E. How does habitat fragmentation impact the amount of nest predation and cowbird parasitism in the Wood Thrush population?

F. What is the maximum number of nesting pairs possible in the Wood Thrush Creek area?

G. What are the changes that occur in this area in the first 10 years? **List all changes made by humans!**

H. What are the possible reasons for those changes (What was added?)?

I. How do the changes affect the Wood Thrush?

J. How many nesting pairs will be able to live and reproduce in Wood Thrush Creek in 10 years?

K. What additional changes occur in this area in the second 10 years?

L. Now, how many Wood Thrush nesting pairs will be able to live and reproduce in Wood Thrush Creek in 20 years?

M. If the total Wood Thrush population in the Present is 50 birds at the end of breeding season, predict the Wood Thrush population at the end of the breeding season 20 years from now. How did you arrive at this number?

N. Summarize your groups discussion about where to put: roads, houses, cut forest.

O. How would the changes your group made in your 10-year future plan be better for the Wood Thrush than the 10-year plan in Scenario: A?

P. How many *more* nest sites did your group provide on your 10-year future plan than on the 10-year plan in Scenario: A?

Q. How would the changes your group made in your 20-year future plan be better for the Wood Thrush than the 20-year plan in Scenario: A?

R. How many *more* nest sites did your group provide on your 20-year future plan than on the 20-year plan in Scenario: A?

S. In your group’s opinion, what would be the best use for Wood Thrush Creek, if you could start now with no human developments?