

If You Were the Boss



A magnificent forest, 400-Acre Wood, has just been donated to your community. You and your team have the job of deciding what to do with this forest.

As you might have guessed, 400-Acre Wood is 400 acres (162 hectares) in size. An acre is an area of land equal to a square that is 208.7 feet on each side, and 400 acres is a little less than 1 square mile. (A hectare [ha] is 10,000 square meters and is equal to about 2.47 acres. To convert acres to hectares, multiply by 0.4047).

400-Acre Wood is made up of pine forest, with about 150 mature pine trees per acre. In addition, it contains lots of wildlife such as owls, deer, bear, woodpeckers, turkey, quails, wood rats, fish, and woodland salamanders.

Wildlife biologists use something called management indicator species (MIS) to evaluate the impact of people's actions on the environment. For 400-Acre Wood, the indicator species are barred owls, wood rats, and woodland salamanders. Wildlife biologists estimate that 400-Acre Wood currently has two barred owls per 100 acres (40 ha) of forest, and one wood rat and 25 woodland salamanders per acre (0.40 ha). That means a total of 8 barred owls, 400 wood rats, and 10,000 salamanders currently live in 400-Acre Wood.

Because the forest currently has no roads or trails, few people use or visit it.

You and your team will make a map of 400-Acre Wood and develop a management plan for it. You may decide to do one thing with the entire forest. Or you may want to divide the forest and do different things in different areas. Your goal is to find what you think is the best balance between visitor enjoyment, trees, wildlife, and money.

Below are the different forest uses you can include in your plan. The "What's the Score?" student page will help you evaluate your plan's total effect on visitors, trees, wildlife, and money.

Wilderness Preserve

The purpose of a wilderness preserve is to allow wildlife and plants to exist without humans interfering. Typically a wilderness preserve has no roads, graded trails, or campsites. Wilderness preserve areas will have the following effects.

Visitors: About 5 people per acre per year will visit the preserve.

Trees: The number of trees per acre will remain the same.

Wildlife: The numbers of owls, wood rats, and salamanders per acre will remain the same.

Money: It will cost money to manage the preserve, and each visitor will pay an entrance fee.

Trails

Graded trails allow different types of visitors to enjoy a forest area, including walkers, cyclists, families with strollers, and wheelchair users. Trails areas will have the following effects.

Visitors: About 25 visitors per acre per year will use the trails.

Trees: Some trees must be cut to build a trail.

Wildlife: The increase in visitors will disturb the wildlife. Owls will leave areas with trails (they sleep during the day when people are about), and trails are dangerous for woodland salamanders as they migrate to pools of water during breeding season. There will be no effect on the wood rat population.

Money: It costs money to build and maintain trails. Trees removed to make the trail can be sold. Each visitor will pay an entrance fee.

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If You Were the Boss (continued)

Campground

A campground allows visitors to enjoy a forest area overnight or over the weekend. It typically has a number of campsites, plus picnic tables, fire pits, parking spaces, and bathrooms. A campground also needs to have a road winding through it. A campground has about 4 sites per acre. Campground areas will have the following effects.

Visitors: About 12.5 campers per site per year will come to the campground, or 50 campers per acre per year.

Trees: Trees need to be removed to build the road and the campsites.

Wildlife: A campground and campers will cause all three indicator species—owls, wood rats, and salamanders—to disappear from the area.

Money: It costs money to build and maintain the road, to clear and level the campsites, and to build and maintain the restrooms. It also costs money to manage the campground. Trees removed for the road and campsites can be sold. Campers pay a camping fee.

Hunting

Some forest areas are managed to encourage game animals (deer, turkey, and quail) for hunters. These areas require a road for visitors. Hunting areas will have the following effects.

Visitors: About 1 hunter per acre per year will visit.

Trees: Trees will need to be removed to build the road.

Wildlife: With regulations to keep game populations constant, there should be no effect on the three indicator species—owls, wood rats, and salamanders.

Money: It will cost money to build and maintain the road. It will also cost money for management. Trees removed for the road can be sold. Hunters will pay a hunting fee.

Fishing

To encourage fish for anglers, a lake can be created by damming the forest stream. Fishing areas will have the following effects.

Visitors: About 2 anglers per acre per year will visit.



Trees: Trees will need to be removed to create the lake.

Wildlife: Creating the lake will cause all three indicator species—owls, wood rats, and salamanders—to disappear from the fishing area.

Money: It will cost money to build the dam to create the lake. It will also cost money for management. Trees removed for the lake can be sold. Anglers will pay a fishing fee.

Timber Harvest

Some forest areas are set aside for timber harvesting, which means cutting trees to sell the logs. Using a sustainable yield approach, only a portion of the trees are removed at any given time. This minimizes the effect on wildlife, while producing as many logs as possible over the long-term. For pine trees, which take 35 years to reach maturity, one-fifth of the trees are cut every 7 years. Timber harvest areas will have the following effects.

Visitors: About 5 people per acre per year will visit.

Trees: Trees will be removed to build the road, plus one-fifth of remaining mature trees will be removed.

Wildlife: The timber harvest will have a minimal impact on the three indicator species.

Money: It will cost money to build and maintain the road and for management. The harvested trees can be sold. Visitors will pay a fee.