

## **Student Activity Sheet**

### **Old-Field Succession Module**

1. List and describe two reasons why agricultural land might be abandoned.
2. If a farmer abandoned his crop land, describe how that land might change over the next 200 years if there isn't a disturbance.
3. What is a perennial plant? Describe (a) one perennial plant and (b) one animal species that you might find living on a three year old abandoned field.
4. List and describe three species of animals that inhabit mature woodlands.

## Teacher Answer Sheet

### Succession Module

1. List and describe two reasons why agricultural land might be abandoned.

Answer. Throughout history, land has been abandoned for many reasons, including worn-out soil, poor markets for crops, human migration and war. The module elaborates on two of these: worn-out soil and war.

Before the development of scientific agricultural practices, farmers often grew one type of crop in one location for many consecutive years. This practice exhausted the nutrients in the soil, and caused crops to decrease in size and quality. When this happened, the farmer would move on to new land, beginning the process all over again. The abandoned bare land would often erode, leaving deep gullies that we can still see in many locations today.

Many men volunteered to fight during the Civil War, World War I, and World War II, leaving their farms behind. Without as much manpower to maintain the fields and farm, a great deal of agricultural land was abandoned.

2. If a farmer abandoned his crop land, describe how that land might change over the next 200 years if there isn't a disturbance.

Answer. The first two years after abandonment a field will become covered with many species of annual plants, like crabgrass and horseweed. Biennial and perennial plants will also begin to grow at this time. Annual plants live for one year, biennial plants live for two years, and perennial plants live longer. Insects, voles and songbirds, like bluebirds and morning doves will begin moving in.

By the time an abandoned field in the Virginia Piedmont is three years old, it will be dominated by broomsedge, a perennial grass. Meadow voles will begin to take advantage of this habitat.

After about five years, scattered eastern redcedar, pine seedlings, and blackberry will begin growing if there is a seed source nearby. Pine seeds are very light, and each seed has a wing, so the wind carries it long distances. These species grow well in full sunlight that bathes abandoned fields. Bobwhite quail, cottontail rabbit, brown thrasher, and white-tailed deer are some animal and bird species that use this habitat.

The first grasses and shrubs that begin growing on an old field are called pioneer species. These species thrive on bare soil, need full sunlight to grow, and are short-lived. Even though they are trees, eastern redcedar, loblolly pine, shortleaf pine, and Virginia pine are also considered pioneer species. These pines live a short period of time compared to many other trees. They will survive for 50 to 75 years, or longer

depending on the species, and then gradually die out over time. As the pines and cedars increase in size, they grow overtop the sun loving grass and briars. Wild turkey, white-tailed deer, ruffed grouse, and hairy woodpeckers are a few of the species that utilize this young forest.

As the pines die, they are gradually replaced by hardwood trees like white oak and mockernut hickory. Forest stands that are 100 years old will often have as many hardwoods as pines, or maybe more! After 200 years, the Piedmont forest that started out as a bare, abandoned field will contain primarily hardwood trees. This forest won't change much over time unless it is disturbed. It is home to animal species such as gray squirrel, raccoon, wild turkey, and great horned owl.

Old-field succession is also called "secondary succession." Secondary succession occurs where a forest or other plant community is cleared by a disturbance that leaves the soil in place. Hurricanes, timber harvesting, or clearing land for crops are examples of disturbances that change the land back to an early stage of succession.

3. What is a perennial plant? Describe (a) one perennial plant and (b) one animal species that you might find living on a three year old abandoned field.

Answer. A perennial plant is one that lives for more than one year. By the time an abandoned field in the Virginia Piedmont is three years old, it will be dominated by broomsedge, a perennial grass. Meadow voles are one species that use this habitat. Meadow voles live in a system of subsurface burrows and tunnels, eating enough grasses and clovers to equal their own body weight!

4. List and describe three species of animals that inhabit mature woodlands.

Answer. Three species that inhabit mature woodlands include the great-horned owl, raccoon, and red fox. The great-horned owl is the second largest American owl. This owl has large ear tufts, yellow eyes, and preys on a variety of species, including grouse, rabbits, beetles, lizards, and frogs. With their ringed tails and black masks, raccoons are easy to recognize. Although they eat many different items, raccoons can often be found searching for crayfish, frogs, worms, and turtle eggs along streams at night! A cautious mammal, the red fox is most active at night. Red foxes eat a wide range of foods, including corn, berries, fruit, acorns, grasses, insects, birds, and small mammals like mice, rabbits, and squirrels.