

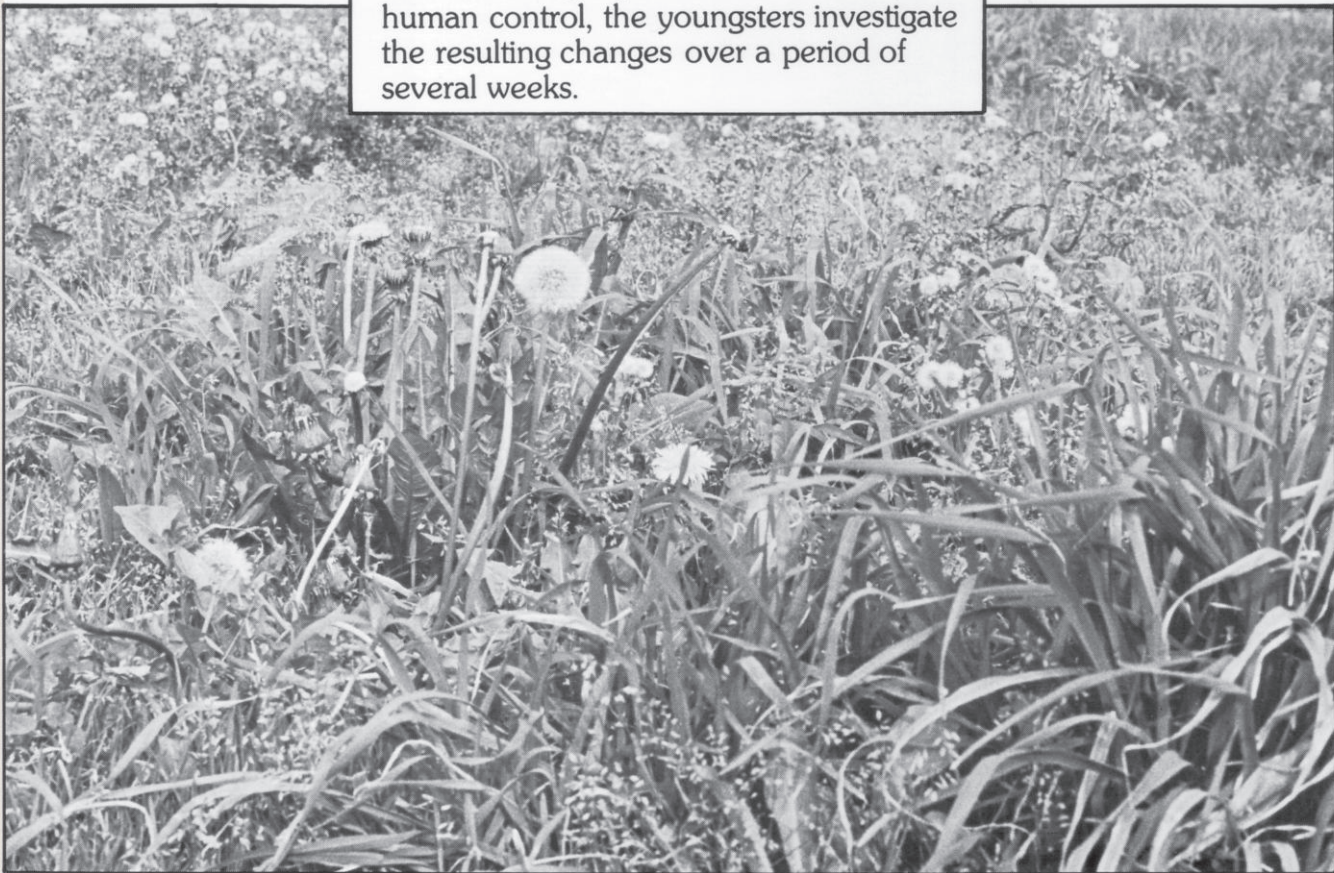
OUT OF CONTROL

BIO Experiment
KEY Colonization
Succession



OVERVIEW

After releasing a portion of a lawn from human control, the youngsters investigate the resulting changes over a period of several weeks.





BACKGROUND

A lawn is an artificially maintained grassland community. Continual work is required to support a lawn: watering, mowing, weeding, fertilizing, aerating, and controlling pests. If these maintenance procedures are abandoned, the lawn community begins to change. New plants and animals move in and eventually replace most of the original lawn organisms. Manicured lawns exist only because of the persistent efforts of people to maintain them for landscaping and recreation purposes.

In this activity, a small section of a lawn is released from human control. All maintenance procedures are stopped or greatly reduced: no more watering, mowing, and so on. By observing the changes in the lawn community as it goes further and further out of control, the youngsters will observe the appearance of new organisms and the emergence of a new community. The occupation of an area by a group of organisms that did not previously live there is called **colonization**. Change over time resulting in the replacement of one community by another is called **succession**.

WHAT TO EXPECT

First you will notice an increase in the size of weeds in the lawn and a tendency for lawn grasses to bloom (that is, go to seed). This is largely due to discontinuation of mowing.

In dry areas of the country, you will soon notice the lawn grasses failing. Local plants (weeds), which are better able to compete for available moisture under out-of-control conditions, will increase in size and number.

Changes in plant diversity and size will attract new populations of hopping and flying animals, mainly insects.

Ultimately, no indication of a lawn will remain. You will end up with a plot of weeds and associated animals. Your lawn will not only be out of control, but out of sight!

CHALLENGE: RELEASE A PORTION OF A LAWN FROM HUMAN CONTROL. INVESTIGATE THE RESULTING CHANGES IN THE LAWN COMMUNITY.

MATERIALS

- 1 ball of string*
- 4 stakes* (about knee high)
- several sweepnets*
- magnifiers* and bug boxes*
- clear plastic bags* (1 liter size)
- copies of the *OBIS Lawn Guide**
- meter sticks*
- transparent tape*
- 1 data board* and marking pen*
- 1 copy of the "Sweepnet" Equipment Card*

* Available from Delta Education.

PREPARATION

Group Size. This activity is suitable for any size group.

Time. This activity requires repeat visits spaced a few weeks apart over a period of several months. A minimum of three visits is required: the first one to set up the out-of-control plot, followed by two others spaced a month or so apart. A longer study period with more visits is

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recommended. The spring and summer are the best times of the year to conduct this activity.

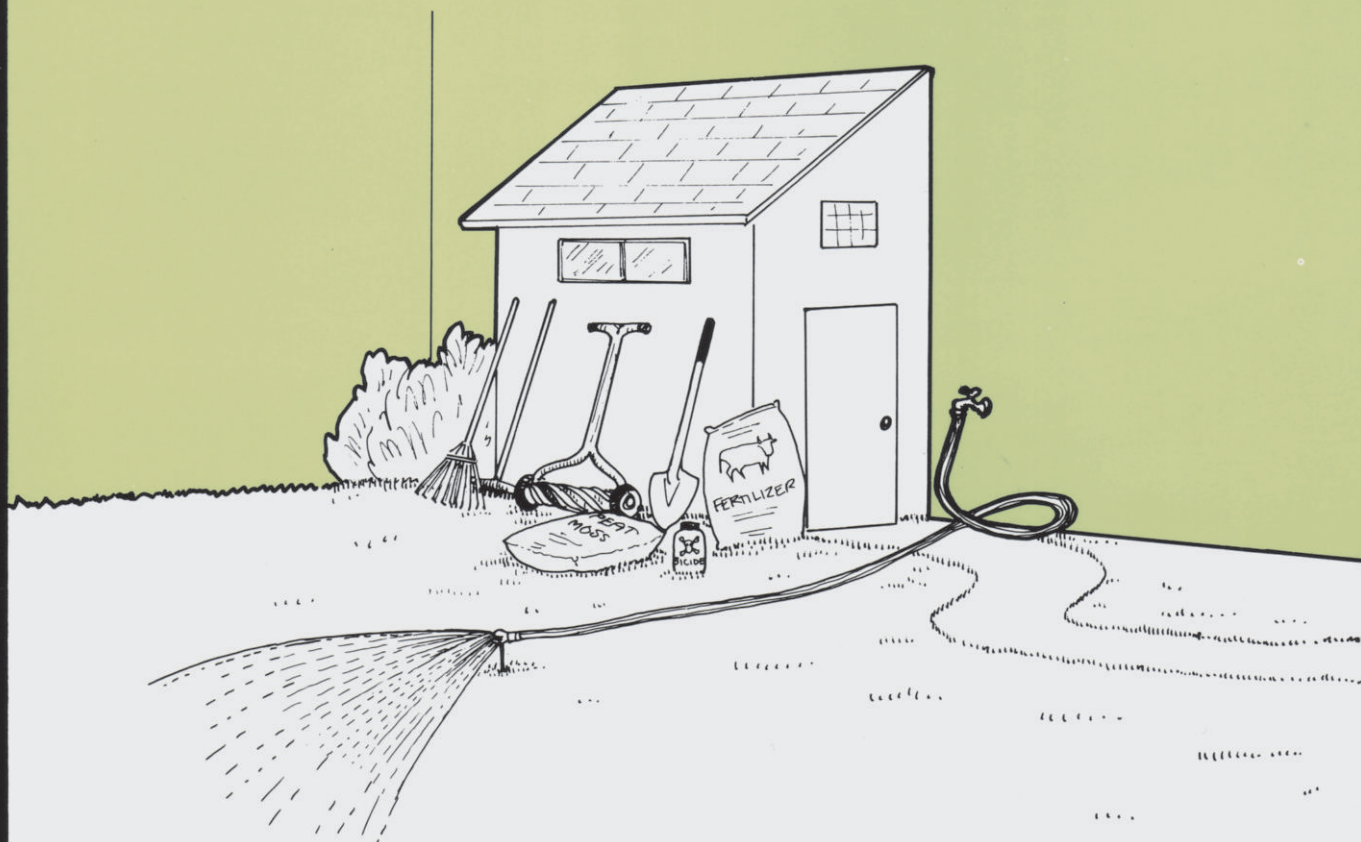
Site. A minimum one-by-three-meter section of lawn is needed for the “out of control” area. A larger portion (up to 10 square meters) is even better. It is essential to secure permission to allow part of your study lawn to go out of control, especially in a public park or on a school lawn. It is also important that the person responsible for the maintenance of the lawn be aware of your experiment.

Sweepnets. See the equipment card for instructions on making and using the sweepnets. Practice the sweepnet technique for capturing and transferring insects to a plastic bag, so you can demonstrate the technique to your group.

ACTION



1. Gather your group at the lawn you selected for your “out of control” experiment, and briefly discuss the characteristics of a lawn. Two points should be stressed.
 - A lawn is an expanse of grass, spiced with a variety of animals and weedy plants.
 - A lawn is continually managed by man.
2. Ask the youngsters what people do to take care of their lawns. As ideas are mentioned, list them on the data board: watering, fertilizing, mowing, weeding, controlling pests. Tell the group that these are all ways people manage the lawn community.



3. Ask the students what they think would happen to a lawn if these management practices were stopped. After some discussion, ask how the youngsters could find out for sure what would happen. The youngsters will probably suggest letting the lawn go without any management.

4. Invite the group to help design an experiment to find out what happens to a lawn when management stops. Introduce the term "out of control" as the name of the experimental-study area, and "control" as the lawn area that will continue to be managed. Three to ten square meters is an adequate area for an out-of-control site. Point out the area you obtained permission to use, and mark its corners with the four stakes. Mark off the area with string, securing the string to the tops of the stakes.

5. Tell the youngsters that they will survey the plants and animals in the site, and make a record of what is there. They will then come back every few weeks to investigate and record any changes in the plant and animal life. During each visit (including the first), the youngsters will survey plant life by:

- collecting one leaf sample from each kind of plant in the site.
- taping the leaves to an outline map of the site.
- measuring and recording plant sizes.

The youngsters will survey animal life by:

- sweepnetting samples of the insects and other small animals in the site.
- recording the animals' names (or drawings of the animals) on the outline map.

6. Demonstrate the sweepnet technique for capturing and transferring small animals to a plastic bag.

7. Divide your group into teams of two. Ask half the teams to survey the plants in the site, and ask the other half to survey the animals.

8. Distribute copies of the *OBIS Lawn Guide*, plastic bags, meter sticks, sweepnets, and magnifiers, and ask the

teams to begin. Encourage the teams to use the guides to identify the plants and animals they find.

9. As the teams work, draw an outline map of the site with a few landmarks for orientation. Put today's date on the map.

10. Help the teams identify their finds, tape leaf samples, record plant measurements, and list the animals on the map.

11. Repeat the plant and animal surveys during each visit. After each visit, ask the teams to discuss the following questions:

- What were the most common plants found today?
- How many different kinds of plants live in the site?
- How tall are the tallest plants?
- What are the most common animals?
- How many different kinds of animals live in the site?

12. After the second and subsequent visits, ask the group to compare the data-board records of their plant and animal surveys. Ask in what ways the out-of-control site is changing. Introduce the concepts of **colonization** and **succession** to the youngsters after they have observed the appearance of new organisms. (See the "Background" section.)

BRANCHING OUT



1. Scrape two 1- \times -1-meter squares of ground down to bare dirt. Water one of the squares every two days and do not water the other at all. Study the colonization of the two squares over several weeks or months.

2. Conduct this activity at different times of the year and compare results.

3. Conduct the OBIS activity *Water Holes to Mini-Ponds* and investigate the changes that occur in fertilized and unfertilized water holes.



SWEEPNET

Equipment Card



Side 1



Note: Commercially available sweepnets* are more durable and we suggest such an investment for schools, camps, or clubs.

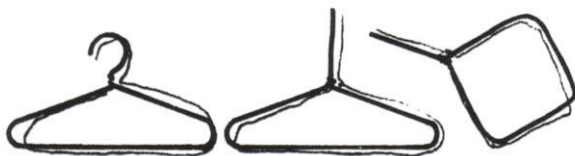
MATERIALS FOR ONE SWEEPNET:

- 2 wire coat hangers or 1 piece of heavy-duty wire
- 1 dowel or broom handle about one meter long and 1.5 cm in diameter
- 1 piece of nylon netting* (mosquito netting), .75 square meter
- 1 needle and thread for sewing (or a sewing machine)
- filament or duct tape*
- 1 pair of pliers

* Available from Delta Education.

MAKING A SWEEPNET:

1. Preparing the Hoop. Take the wire coat hangers, straighten the hooks and pull the hangers together into a square (one hanger on top of the other). The pliers make this job easier.



2. Preparing the Bag. Your net should be approximately .75 meter in circumference at the top, tapering down to a point. A sewing machine speeds up construction, but older kids can hand sew the nets if sufficient time is provided. Sew like this:



Fold one edge down and sew

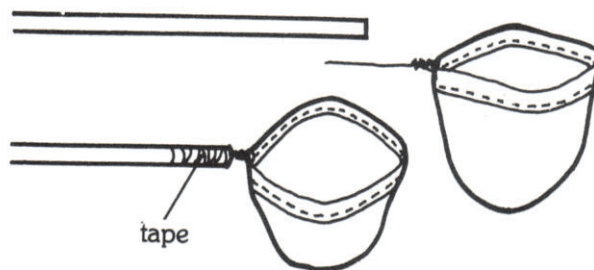
Fold square in half and sew

Cut off excess

3. Assembling the Net. Open the wire square (both squares, if you used two hangers) and thread the net on the wire (or wires).



Attach the wire hoop to the stick.



USING A SWEEPNET:

While a sweepnet can be used to pursue and capture an animal that has caught your eye, this is not the most efficient use of the net. A sweepnet is best used as a random sampling tool. You walk at moderate speed across a grassy area, sweeping the net back and forth in pendulum fashion, in front of you. The net should just brush across the top of the grass. The idea is to sweep any animals that are buzzing around in front of you into the nets, so you must turn the net in your hand to capture animals on both right and left swings of the net. After you have made fifteen to thirty swings of the net, make a quick swing around your head to concentrate the animals at the bottom of the net, and grab the top of the net in your hand to keep the catch from escaping.

SWEEPNET

Equipment Card



Side 2



TRANSFERRING ANIMALS FROM THE NET TO AN OBSERVATION BAG:

1. Concentrate the animals in the bottom of the net.



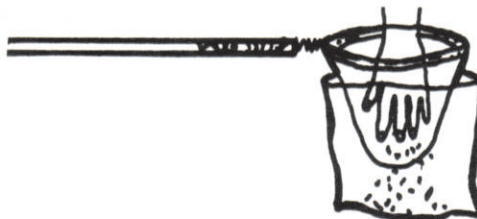
2. Pinch the net closed, keeping the animals in the bottom of the net.



3. Turn the net inside out while holding the animals.



4. Place the net in a plastic bag, then release and shake the animals into the bag.



5. Grab the top of the bag.



6. Twist the top of the bag a couple of times and tuck the top under your belt or into an open pocket while you continue to sweep.