

# Discoveries with Sweep nets

## ***Pest Control Standards check Activity***

### **Essential Question:**

What pests and predators do you have on your club site?

### **At a Glance:**

Learners will survey their club site for signs of the Pest and Disease Control Department and use field guides to identify the observed organisms.

### **Background Information:**

Pests come in many shapes and sizes. On your club site you may see mildew (fungi), cockroaches, poison ivy, kudzu, mice, rats, raccoons and stray cats, among others. The term “pest” is used to describe an organism in an undesirable situation. For instance, a moth is an important pollinator but can be a pest if chewing holes in stored sweaters. A weed is considered a pest but is simply a misplaced plant. In another setting this plant may be considered useful and beautiful. The definition of “pest” is in the eyes of the beholder.

### **Insects and Arthropods**

Many animals contribute to controlling pests and diseases in natural and human-influenced ecosystems. Insects are considered pests if they feed on important plants or other items that are valued by humans. Some insects, such as ants and wasps, are important predators and can control populations of other insects including those that are considered pests. Other arthropods, such as spiders and scorpions, are also valuable predators.

Many species of insects and other arthropods walk along the ground searching for food. In order to monitor these animals, learners will set up pitfall traps. The idea for a pitfall trap is simple: the learner creates a hole in the ground (a pit) that the insect falls into while walking around searching for food, water or some other item.

Other insects can be found on vegetation such as grasses. These insects can be sampled using sweep nets. Sweep nets are brushed across vegetation in a sweeping motion and insects that are on the vegetation fall into the nets.

### **Invasive Plants and Weeds**

A weed is a plant growing in a spot where it is not wanted. Weeds can be of economic significance in connection with farming. For example, weeds may weaken crops when growing in agricultural fields and poison domesticated animals when growing on pasture land. Many weeds are short-lived annual plants that in nature take advantage of temporarily bare soil to produce a generation of seeds before the soil is covered over again by slower growing perennial plants. In agriculture, extensive areas of

**Location:** Checkpoints

**Objectives:** *Learners will*

- 1) discover evidence of insect ‘friends’ and ‘pests’ on the club site.
- 2) capture and observe insects with sweep nets.
- 3) classify organisms found during the activities as pests or beneficials.

**Skills:** communication, observation, data collection, listening, analysis

**Supplies:**

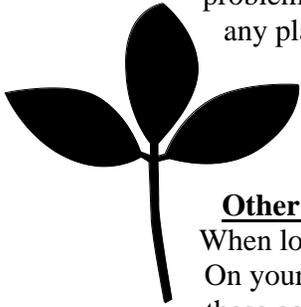
- sweep nets
- pens/pencils
- insect ID books
- magnifying lenses
- insect descriptions
- Standards Checks data sheet
- Standards Checks Map
- compass

**Subjects:** science

**Time:** 30 minutes

ploughed soil are exposed every year, and weedy plants have many more opportunities to grow. The notion of "wanted" is of course subjective. A weed in one situation might be a wildflower in another. Dandelion root can be used as a herbal medicine, and dandelion leaves, which are edible, are sold in some restaurants and grocery stores. Yet the caretaker of a lawn will generally regard the dandelion as a troublesome weed to be removed.

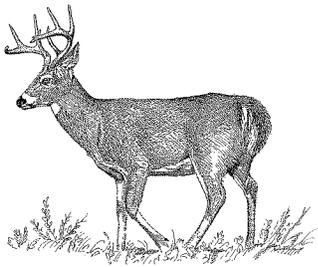
There are many invasive plants in Georgia and these can also be considered weeds. Invasive species displace native species, destroy habitat and food for wildlife, alter hydrology and nutrient flow and compete for pollinators and seed dispersers on which native plants depend. The ornamental shrub, Chinese Privet, was introduced into the United States in the early 1800s for hedgerows, but the plant has taken over soils of floodplains and once established it is very hard to remove. Kudzu is another problematic invasive plant. Kudzu covers trees and plants; growing rapidly and smothering any plants in its path.



Other plants bother humans directly such as poison ivy, poison oak and stinging nettles, but to name a few. These plants are also considered pests.

### Other Pests

When looking for pests, be aware of fungi, viruses, and bacteria. On your discovery walk you may notice plant damage caused by these agents. Mildew is one common form of fungus; other types of fungi will move into insect-damaged plants. For example, the Pine Bark Beetle may enter a slightly damaged tree then further increase the damage. The Pine Bark Beetle carries a blue stain fungus which will then establish itself in the tree and damage the tree from the inside. Often it is the fungus that kills the tree and not the beetle damage.



You may also find signs of animals such as mice, deer, snakes and birds. Mice and rats are often considered a health hazard when found in and around buildings. Deer and rabbits can be deemed as pests when they start eating your favorite plants in your garden! In urban areas, birds such as pigeons can produce huge amounts of droppings that can be a health issue and can degrade buildings or statues. Many people do not like to discover a venomous snake on their property even though it is a predator of small rodents.

To improve the health of the ecosystem on your club site you can increase the diversity and abundance of beneficial insects and other arthropods, reduce the amount of weeds, pest plants (poison ivy), and invasive plants, and try to reduce the damage of mice and deer on the club site by providing alternatives for them.

See also: *Background Information for Garden Earth: Pest and Disease Control Department.*

### **Getting Ready:**

Observations can be made using sweep nets, pitfall traps or simply your eyes. If using pitfall traps, they need to be set out the day before. If using sweep nets, specific directions follow. This method requires a grassy area.

### **Procedure:**

1. Ask the learners to think about the pests on their club site or other nearby location. List the pests that learners name. Ask them to think of some predators on their site.
2. Begin by explaining that a lot of pests like insects are not easy to see. Ask why this may be so. Make learners aware of signs of pests, e.g., chewed leaves, insect poop, damaged bark, etc.
3. Explain data sheet.
4. Divide learners into three teams and send each team to a Checkpoint.
5. Groups are to make a series of sweeps with the net 2 paces North and 2 paces South of the Checkpoint.
6. Learners will record any pest observations and their locations on their data sheet. They may use a compass and Standards Checks Map to describe exact locations of pests.

**If using sweep nets:**

1. Move the group to a grassy area where insects will be on the vegetation.
2. Distribute sweep nets to the learners (most likely learners will need to take turns using the sweep nets). Allow each student to make five sweeps with the net, brushing the net on the vegetation while sweeping. Remove the contents of the net and place the insects in a vial or insect box for further observation. Have learners move around the grassy area and sample places that have not been sampled by other learners.
3. Each student should record the number and types of insects or other arthropods in his or her net. Learners should use a field guide to identify the insects and arthropods that they caught.

**Discussion/Assessment:**

Allow time for pairs of learners to review their results.

Discuss findings. Note how many insects were harmful and how many were not.

How does the Pest and Disease Control Department affect the collection site?

How does the site affect the Pest and Disease Control Department?

Discuss with learners in what settings and situations the pests that they discovered may be considered beneficial.

Where many beneficial insects discovered?

What are some ways in which more beneficials could be invited to your club site?

What are some ways in which pests could be deterred?

How can the Pest and Disease Control Department be improved on your club site?

**Extension**

Play Pest and Disease Control Bingo (located in your GEN manual) for a fun review. It could also be played beforehand to assist learners in understanding pests and in knowing what to look for.

# Pest and Disease Control Department

## *ECO-STANDARDS CHECK*

### DISCOVERIES WITH SWEEP NETS!

Team Members \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Checkpoint # or Name \_\_\_\_\_ Direction (circle) N S

Weather Conditions: \_\_\_\_\_

**INSTRUCTIONS:** From your checkpoint, head 2 paces N. Make 5 sweeps with the net as you walk forward. Identify and count the organisms in the net. If there is more than one kind of organisms, i.e. beetle or ant, give each type a name and count separately (for example, small black beetle & long brown beetle). Return to the checkpoint, walk two paces south, and repeat the sweep sample.

**Data from Sweep 1: Location: 2 paces North of checkpoint**

Type of insect or arthropod	Number found	Descriptions

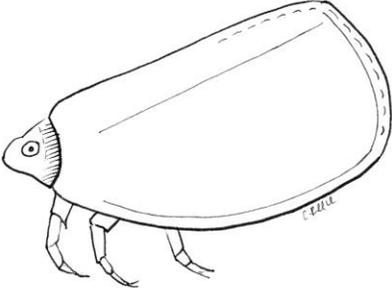
**Data from Sweep 2: Location: 2 paces South of checkpoint**

Type of insect or arthropod	Number found	Descriptions

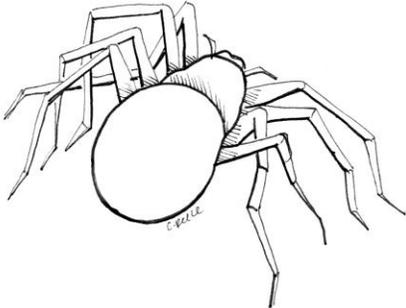
**Summary of the total numbers of animals observed from both sweeps**

Insects <i>(6 legs)</i>	Arachnids <i>(8 legs)</i>	Isopods	Centipedes Millipedes	Other

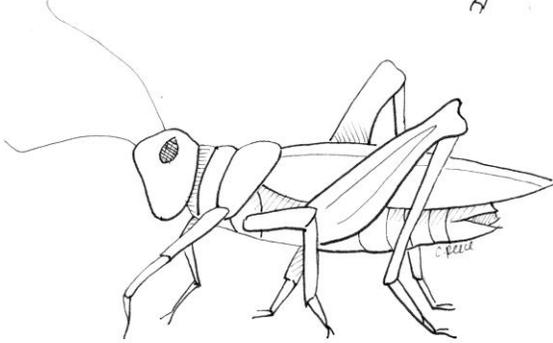
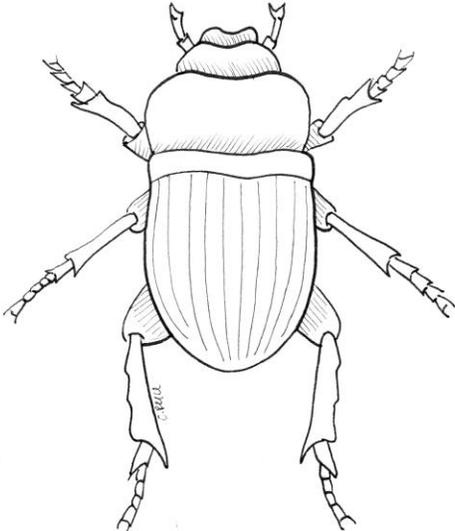
**Leaf hopper**



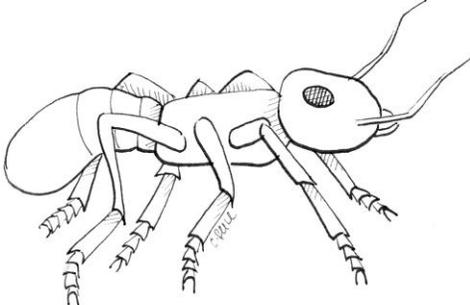
**Spider**



**Beetle**



**Grasshopper**



**Ant**

**INSECTS YOU MAY FIND IN SWEEP NETS**