

# CHAPTER 9

## VERTEBRATE PESTS

### LEARNING OBJECTIVES

After completely studying this chapter, you should:

- Know the types of damage caused by various vertebrate pests and when it is necessary to apply control techniques.
- Understand the various control techniques available to control vertebrate pest damage.
- Know what six questions need to be considered to apply the appropriate control technique.

### WILD VERTEBRATE POPULATIONS AND PROBLEMS

Wild vertebrates—mammals, birds, reptiles, amphibians, and fish—are an important part of a healthy forest. Most oak trees, for example, are planted as acorns by squirrels and birds. At times, however, an increase in animal numbers or a change in their behavior can damage commercially valuable trees. When this occurs, the damage they cause may require control. Most often, damage by wild animals to naturally occurring forests is not severe enough to be of concern, but occasionally damage control efforts are economically and ecologically worthwhile. For example, abundant rodents, rabbits, or deer can totally prevent forest regeneration or severely damage entire stands of seedlings and saplings.

The table on the following page lists kinds of damage, species involved, and current damage control techniques.



Figure 9.1. Browsing by white-tailed deer can prevent forest regeneration (C.J. Randall, Michigan State University).

### DAMAGE CONTROL TECHNIQUES

#### Repellents

Repellents are devices or chemicals that irritate one or more of the senses of an animal and cause it to change its behavior. Repellents are usually cost effective only in nurseries and Christmas tree plantations. Even then, durability is limited (i.e., many repellents wash off in the rain), and the cost of repeated application usually makes other methods preferable. Seed treatments, chemical sprays, and auditory repellents for short-term problems are examples of efficient repellents.

**Table 9.1. Vertebrate damage and control techniques.**

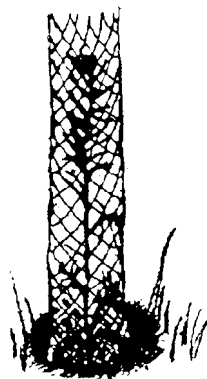
Damage	Species	Control Technique
Consumption of seed in tree nurseries	rodents birds	repellents, toxic baits repellents, physical barriers
Consumption of seedlings and saplings in tree nurseries and naturally occurring stands; consumption of bark or branches; deformation of trees	rodents  deer, rabbits, porcupines, bears, and elk	repellents, toxic baits, physical barriers, biological controls, cultural techniques  repellents, physical barriers, shooting, traps, silvicultural practices, dog restraint systems
Consumption of buds	squirrels, birds, deer	physical barriers, repellents
Flooding of trees; consumption of bark or branches; deformation of trees	beavers	destruction or modification of dam, trapping, shooting



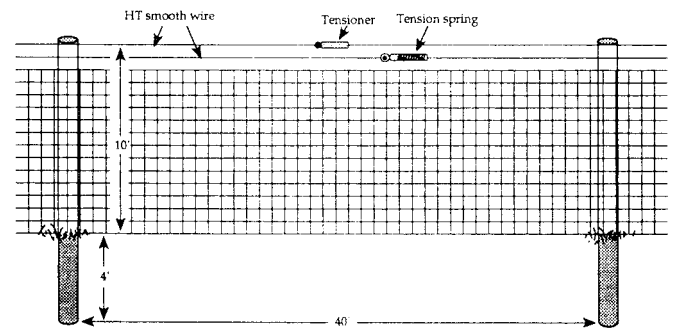
**Figure 9.2. Repellents will help prevent consumption of buds by tree squirrels.**

### Physical Barriers

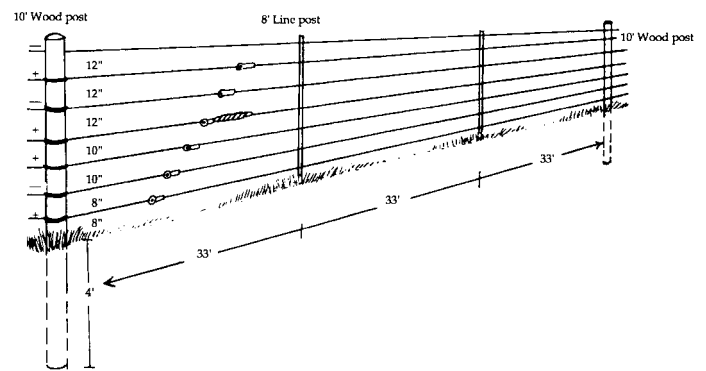
A physical barrier is a device used to exclude animals to prevent damage. Examples of physical barriers to individual trees are sheet metal, wire mesh, or plastic around the trunk of seed orchard trees to exclude squirrels or around the bases of Christmas trees to exclude mice. Permanent 8- to 10-foot-high woven wire fences and seven- or eight-wire high tensile strength steel electric fences are examples of area barriers.



**Figure 9.3. Plastic mesh seedling protector.**



**Figure 9.4. The deerproof woven wire fence.**



**Figure 9.5. Electric seven-wire vertical deer fence.**

### Cultural and Silvicultural Practices

Damage can be prevented by forest management techniques. Increasing the size of irregularly shaped clearcuts can produce more seedlings than a deer herd can consume, leaving enough for adequate regeneration. Growing species or varieties of trees less palatable to wild animals, especially in areas most subject to damage, also helps reduce or control damage. Elimination of vole habitat in nurseries and plantations is most helpful.



Figure 9.6. Meadow vole damage can be prevented by eliminating habitat (i.e., weeds, ground cover, litter) around plantation trees (L.L. Master, Mammal Images Library of the American Society of Mammalogists).

### Toxic Baits

Mixed grains or food pellets treated with poison can be used to reduce rodent populations that would consume seeds or seedlings. Correct application—such as using PVC tubes to hold the bait—is essential to successfully reduce damage and avoid killing non-target animals.

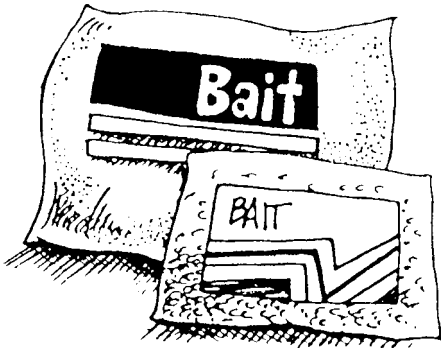


Figure 9.7. Various types of bait packs containing rodenticides are commercially available. Placing the bait packs inside PVC tubes will avoid killing non-target animals.

### Trapping and Shooting

At times, damage may be caused by only a few individuals or be confined to a relatively small area. In these cases, shooting or trapping may be efficient damage control techniques. In Michigan, a permit is required for most trapping and shooting control situations. Check with the Michigan DNR Wildlife Division for a permit application. Also, always check local regulations before discharging any firearm. Hunting during the legal season can also reduce damage, especially over large areas, if the damage results from large numbers of animals. (Note: damage may result from habitat mismanagement, weather, or poor human choices instead of high numbers of animals.)

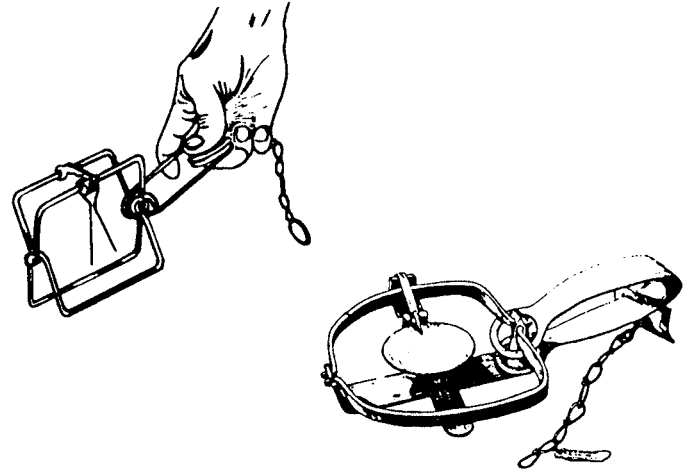


Figure 9.8. Two types of traps—body-gripping (top) and leghold (below).

### Biological Controls

Encouraging predatory birds (raptors) and snakes to use tree nurseries and plantations facilitates damage control. Raptors can be encouraged to hunt nurseries and plantations by placing nesting boxes for kestrels and perches for other hawks and owls in or near the area. Large numbers of harmless vole-eating snakes can be attracted to tree areas in spring and fall by creating a snake hibernaculum (overwintering shelter).

### Dog Restraint Systems

Dogs confined to a tree area by electric shock collars and a perimeter antenna wire will greatly limit deer and rabbit damage. Dogs, preferably two males, must be housed, watered, and fed within the perimeter wire and must be trained not to cross the wire.

### Beaver Dam Modification

If the presence of beaver in an area is acceptable or desirable but the beaver pond floods the wrong place, the dam can be modified to permanently reduce or eliminate the beaver pond by properly using and installing perforated plastic pipe.

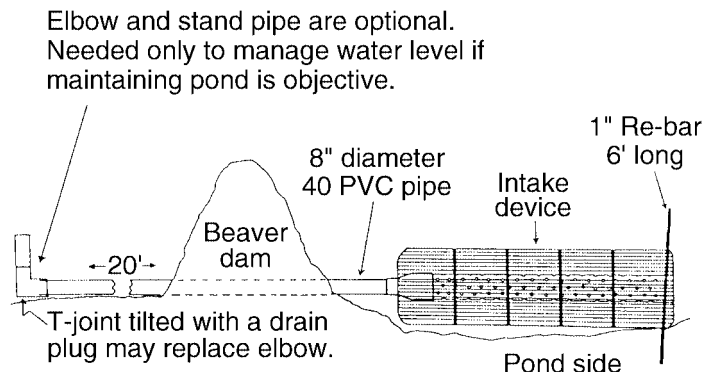


Figure 9.9. Use of PVC pipe to prevent flooding by beaver ponds—the Clemson beaver pond leveler.

## DESIRABILITY OF A SPECIFIC CONTROL PRESCRIPTION

Before applying pest damage control techniques, one must answer six questions.

1. **What is the problem?** Sapsucker damage to trees, for example, occurs in trees weakened by some other cause, such as insects, disease, mechanical injury, site conditions, etc. Solving the problem involves treating the tree, not the sapsuckers. Another example is damage to bark caused by weather or insects, not vertebrates.
2. **Will the technique(s) work?** Effective taste repellents, for example, may be applied to young trees in the spring, but subsequent untreated new growth over the summer is then browsed by deer or rabbits. In this case the repellent did not fail—the applicator failed to match application to damage. As another example, ultrasonic repellent devices have little effect on most vertebrates.
3. **Are the techniques efficient?** Will the cost of the technique be less than the cost of the damage? Benefits should be greater than costs.
4. **Which combinations of techniques are most efficient?** Integrated damage control is not only always more efficient—it is often the only effective strategy.

5. **Will non-target species be affected?** If so, how seriously? Applications of any lethal control that seriously reduce numbers of non-target species should not even be considered except when the alternative loss is great. No lethal control should ever be applied if its use or repeated use causes long-term reductions of non-target species.
6. **Will the reduction of damage-causing animal numbers be effective or create additional or more serious problems?** In some cases, large numbers of the damage-causing animal are not the main reason for the damage.

Reducing the number of animals, except for total elimination, may not limit damage. An example is flooding caused by beaver activity. An annual killing of beavers will not result in the elimination of the dam that is the cause of the flooding, but modification of the dam may permanently solve the problem. Also, a change in the numbers of one animal could produce changes in numbers or behavior of another animal so that one problem is traded for another. For example, shrews may damage a seed or seedling bed, but choosing a control strategy that eliminates shrews may result in an increase in their prey—mice and voles—which can be far more destructive.

The concepts of integrated pest management apply to vertebrate populations in the same way they apply to disease, insects, and weed pests of forests and Christmas tree plantations.

## CHAPTER 9

### Review Questions

#### Chapter 9: Vertebrate Pests

Write the answers to the following questions and then check your answers with those in the back of the manual.

1. When is it necessary to implement control of vertebrate pests in forest situations?
  - A. Whenever vertebrate damage is evident in forest surveys.
  - B. Whenever the deer population is abundant.
  - C. Whenever it is economically and ecologically worthwhile.
  - D. Whenever there are not enough predators to keep the wildlife population in check.
2. Where are repellents most likely to be cost effective?
  - A. In mature forest stands.
  - B. In nurseries and Christmas tree plantations.
  - C. In large clear-cuts.
  - D. In uncultivated areas.
- 3-7. Match the following vertebrate damage control to the appropriate description.
  - A. Repellents
  - B. Physical barriers
  - C. Cultural and silvicultural practices
  - D. Toxic baits
  - E. Biological controls
- \_\_\_\_\_ 3. Devices used to exclude animals and prevent damage.
- \_\_\_\_\_ 4. Mixed grains or food pellets treated with poison to reduce populations of rodents that would consume seeds or seedlings.
- \_\_\_\_\_ 5. Devices or chemicals that irritate one or more of the senses of an animal and cause it to change its behavior.

- \_\_\_\_\_ 6. One example would be placing nesting boxes for kestrels and perches for hawks and owls in or near a nursery or plantation.
- \_\_\_\_\_ 7. Preventing damage through forest management techniques.
8. Which control method would be appropriate to prevent rodents from eating seed in tree nurseries?
- Toxic bait
  - Shooting
  - Physical barriers
  - All of the above
9. Which control method would be appropriate to prevent squirrels from consuming tree buds?
- Shooting
  - Trapping
  - Repellents
  - All of the above
10. Which control method would be appropriate to prevent flooding of trees by the dam building of beavers?
- Shooting
  - Trapping
  - Destruction or modification of dam
  - All of the above
11. Which control method would be appropriate to prevent deer from consuming saplings in tree nurseries?
- Silvicultural practices
  - Repellents
  - Dog restraint systems
  - All of the above
12. Which is NOT true concerning trapping or shooting to control vertebrate damage?
- Hunting during the legal season can reduce damage over large areas.
  - A DNR permit is often required.
  - It is not useful for controlling damage caused by a few individuals.
  - You must know the local regulations regarding discharging of firearms.
13. Give an example of a physical barrier for controlling animal damage.
14. Give an example of a cultural or silvicultural practice for controlling animal damage.
15. Describe how the dog restraint system works to limit deer and rabbit damage.
16. How do you control damage from beaver dams without harming the beaver?
17. Before applying a pest damage control technique, you must first determine:
- If the technique(s) will work.
  - What the problem is.
  - If the technique(s) is efficient.
  - If non-target species will be affected.

18. Lethal controls that affect non-target species should never be used unless the alternative loss is great.

- A. True
- B. False

19. Integrated damage control is not only always more efficient—it is often the only effective strategy.

- A. True
- B. False

20. Explain how the reduction of damage-causing animal numbers could possibly create additional or more serious problems. Give an example.