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FROGS AND TOADS



Fig. 1. Great Plains toad, *Bufo cognatus*

Damage Prevention and Control Methods

Exclusion

Seal all openings 3/16 inch (0.5 cm) or larger to exclude frogs.

A frogproof fence can be used for nonclimbing species, but will be ineffective against treefrogs and a few related species.

On fish farms, mesh tenting over ponds will serve to exclude frogs as well as birds and other predators.

Habitat Modification

Around hatchery ponds, keep vegetation closely mown and remove emergent vegetation and other types of cover.

Frightening

Not applicable.

Repellents

None are registered.

Toxicants

None are registered.

Fumigants

None are registered.

Trapping

Funnel traps.

Capture

Capture by hand or gig at night.

Egg masses may be removed with a fine-meshed net.

Shooting

Allowed in some states, but often not safe in areas requiring control.

Some states permit shooting only during daylight hours.



PREVENTION AND CONTROL OF WILDLIFE DAMAGE — 1994

Cooperative Extension Division
Institute of Agriculture and Natural Resources
University of Nebraska - Lincoln

United States Department of Agriculture
Animal and Plant Health Inspection Service
Animal Damage Control

Great Plains Agricultural Council
Wildlife Committee

Identification

Frogs and toads are amphibians with four legs and no tail. They may have skin that is smooth and moist or dry and warty, but they have no scales or claws. The front legs are short, but the hind legs are muscular and elongated for hopping or jumping. The popular distinction between frogs and toads is somewhat artificial; basically, toads are a particular group of frogs. Throughout this chapter, the term frog will be used to include toads. North American frogs range in body size from the 11/16-inch (1.7-cm) little grass frog to the 8-inch (20-cm) bullfrog.

Range

At least 85 species of frogs are native to the United States, and there are three well-established exotic species. There is no part of the country that is not home to at least a few species.

Habitat

Frogs occur in almost all nonmarine habitats. "True" frogs (genus *Rana*) and treefrogs predominate in the more humid east. In the drier Great Plains and western regions, toads and spadefoots are typically more numerous. Whereas some species are seldom found far from permanent water, others return to water only seasonally to breed. Some desert species spend most of their time beneath ground, venturing to the surface only following rains.

Food Habits

Most frogs have a two-phased life cycle, including an aquatic larval form (tadpole) and a terrestrial or semi-aquatic adult form. Tadpoles are primarily herbivorous, feeding on algae and decaying organic matter. Adults, on the other hand, are carnivorous, consuming almost any prey that can be overpowered. Although the diet consists primarily of insects, crayfish, and other invertebrates, larger frogs occasionally take snakes, other frogs, fish,

mice, and small birds. In natural habitats, fish usually comprise less than 5% of the diet of the bullfrog. On fish farms, as many as 30% of bullfrogs have been found to contain fish.

General Biology, Reproduction, and Behavior

Although some species spend most of their adult lives away from water, most frogs native to North America must return to water to lay eggs. Some species breed during the cooler winter and spring months, whereas others breed during the warmer months. Following rain, males begin calling from breeding sites. Each species has its own distinctive call, and females respond only to the calls of their own species. Several recordings of frog calls are available, and four are listed at the end of this chapter.

Eggs are fertilized by the male as they are released by the female. Hatching occurs a few days later. The aquatic tadpole stage may last as little as 2 to 3 weeks in some species of spadefoots or as long as 2 years in some northern populations of bullfrogs.

Frogs are typically most active at night. Some species aggregate around artificial lights and feed on the insects attracted there. Frogs are an important component of the vertebrate food chain and are consumed by a variety of predators, including fish, snakes, turtles, wading birds, raptors, skunks, and raccoons. Individuals of many species may live 12 to 15 years, but life expectancy is much shorter in the wild.

Damage

The greatest potential for economic damage is at fish farms and hatcheries. Tadpoles compete for food intended for fish, and adult bullfrogs may actually feed on the fish. Losses are said to be high at some fish farms. One study suggested that the mere presence of high densities of tadpoles retarded reproduction of fish. Although the bullfrog is native to most of the eastern United States, its introduction to por-

tions of the west has seriously affected some native species. In at least some cases, these introductions may have resulted from the unintentional release of tadpoles during fish-stocking programs. Considerable labor is required to separate tadpoles from loads of fry.

Only in rare instances do frogs cause any significant damage. Some species (toads, for example) produce skin secretions that are toxic if ingested. This does not normally present a problem for people, and pets usually learn to avoid such frogs. A few species (giant toad, Colorado River toad) produce especially copious or toxic secretions, and there have been cases in which dogs have died after biting them.

The noise sometimes produced by large breeding choruses of frogs following heavy rains can be annoying to humans. These aggregations usually last only a few days, however, and seldom warrant control. Similarly, complaints sometimes arise when large numbers of young frogs leave the ponds *en masse*, but the frogs disperse quickly, and the "problem" will take care of itself in a few days.

Legal Status

Laws pertaining to frogs vary from state to state. Some rare species (for example, Houston toad, Wyoming toad, Pine Barrens treefrog) may be fully protected under federal or state laws. Seasons and bag limits may apply to other species (bullfrogs, for example). Permits to remove frogs that are causing damage are available in some states. Contact your state wildlife department to determine the legal status of frogs in your area.

Damage Prevention and Control Methods

Exclusion

The effectiveness of exclusion depends in part on the species involved. Most species responsible for potential or real damage can be effectively excluded from limited areas. Giant toads (south-

ern Florida, extreme southern Texas) or Colorado River toads (southern Arizona, extreme southeastern California) can be excluded from pet enclosures by placing a strip of 1/8-inch (0.3-cm) mesh hardware cloth along the outside base of the perimeter fence. The hardware cloth should be buried at least 4 inches (10 cm) in the ground and should extend to a height of at least 20 inches (50 cm). A similar exclusion fence can be used to control breeding aggregations of nonclimbing species in small, urban stormwater detention basins or to exclude these species from small hatchery ponds. Although treefrogs and some related species will readily climb such a fence, most treefrogs normally breed in seasonal, fish-free waters. In addition, their eggs and tadpoles are readily eaten by fish, so they do not usually present a significant problem on fish farms.

Habitat Modification

Keep the shoreline of ponds free of emergent vegetation to minimize cover for adult frogs and allow predators to assist in control. Efforts to directly remove adult frogs at night will also be facilitated.

Frightening

Not applicable.

Repellents

None are registered.

Toxicants

None are registered.

Fumigants

None are registered.

Trapping

Place funnel traps along the base of a perimeter fence. Toads may also be trapped by burying several 5-gallon (19-l) buckets flush with the ground surface beneath an overhead light. Toads attracted by the insects drawn to the light will fall into the buckets and be unable to escape.

Caution: traps may capture other non-target species, including snakes, turtles, and small mammals.

Capture

Frogs can be located at night by the reflection of their eyes in the beam of a headlamp. They can be collected by gig or hand. Captured frogs may be eaten, or where allowed by law, sold to provide additional economic returns. Check with your state wildlife agency regarding seasons, bag limits, legal methods of take, and restrictions on sale.

Shooting

Although shooting is allowable in some states, it is not safe in some areas requiring control.

Economics of Damage and Control

Frogs eat many insect pests. With the exception of fish farms, control measures for frogs are seldom warranted and, in most cases, should be discouraged. On fish farms, the economic damage depends in part on the unit value of the fish produced. Corse and Metter (1980) provided data suggesting that a 350-pond farm that produced goldfish might sustain \$42,000 in annual losses to bullfrogs, whereas the same facility might sustain only \$12,600 in losses if it produced golden shiners, a less valuable species. It follows that losses might be still higher on farms specializing in valuable aquarium fishes.

Acknowledgments

Figure 1 by Randy Babb, Arizona Game and Fish Department.

For Additional Information

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