

The background of the slide is a photograph of a sunset or sunrise. The sky is filled with vibrant orange, red, and yellow hues, with wispy clouds catching the low light. In the foreground, the dark silhouettes of tall, thin grasses or reeds are visible, some standing upright and others leaning, creating a sense of depth and texture. The overall mood is serene yet powerful, suggesting a natural setting.

Identification and Management of Wildlife Damage

Wildlife Damage Management

- ▶ Wildlife Damage in the US
 - Cost is ~ \$22 billion annually



- ▶ Control is important due to
 - Expanding human populations
 - Intensified land-use practices

Wildlife Damage Management Must Be . . .

- ▶ Based on sound economic, ecological, and sociological principles
- ▶ Carried out as positive, necessary components of wildlife management programs
 - Actions must be justified, environmentally safe, humane, and in the public interest

Four Principle Components

(1) Problem definition

- Species causing problem
- Number of animals
- Amount of loss
- Nature of conflict

(2) Ecology of the problem species

(3) Management methods application

- Develop an appropriate management strategy using (1) and (2)

(4) Evaluation of management effort

- Assess the results relative to cost and impact on target and non-target populations

Legal Requirements for Management

- ▶ It is important to understand the laws regarding target and non-target species
 - Capture, possession, or killing of most mammals, reptiles, and amphibians is regulated by state or provincial laws
 - Federal regulations require that a depredation permit be obtained before most migratory birds can be captured, killed, possessed, or transported to control depredation



Examples of Damage by Birds

Species	Damage
Blackbirds, Starlings	Aviation safety, Crops (corn, sunflower, rice), Nuisance
Pigeons, House Sparrows	Grain contamination, Building Damage
Crows, Ravens, Magpies	Predation (birds, livestock), Crops (corn, fruit), Nuisance
Hérons, Egrets, Cormorants	Commercial and natural fisheries
Raptors	Aviation safety, Predation (poultry, livestock)
Woodpeckers	Damage to wooden structures, Nuisance
Ducks, Geese, Sandhill Cranes	Aviation safety, Crops, Nuisance

Examples of Control Techniques for Birds

- ▶ Habitat Modification and Cultural Practices
- ▶ Netting and Screening
- ▶ Frightening Devices
- ▶ Repellents
- ▶ Toxicants and Capture Agents

Habitat Modification and Cultural Practices

- ▶ Can be implemented to make roosting, loafing, or feeding sites less attractive
- ▶ Lure crops may be used to control waterfowl or blackbirds.
- ▶ Bird-resistant crops may also be used to limit losses



Proofing and Screening

- ▶ Plastic netting to protect crops
- ▶ Netting or wire screening may be used to exclude birds from building structures
- ▶ Building ledges can be angled 45° to deter perching
- ▶ Spikes and electric wires can be used to deter perching
- ▶ Overhead monofilament lines can be used to deter many bird species



Frightening Devices

- ▶ No device is 100% effective
 - Birds quickly habituate



- ▶ Propane cannons
- ▶ Pyrotechnics
- ▶ Recorded alarm / distress calls



- ▶ Flags, kites, and helium balloons
- ▶ Strobe lights
- ▶ Ultrasonic devices

Repellents, Toxicants, and Capture Agents

- ▶ Repellents based on smell and taste are generally ineffective
- ▶ Condition-aversive repellents are more effective
 - Produce illness or adverse physiological responses upon ingestion
- ▶ Toxicants and capture agents require knowledge of the habits and food preferences of the target species
 - DRC-1339: used to control starlings, gulls
 - Avitrol: frightening agent used to control pigeons, gulls, house sparrows, starlings, blackbirds
 - Alpha-chloralose: used to capture waterfowl and pigeons

Examples of Damage by Rodents and Small Mammals

Species	Damage
Deer & White-footed mice	Seed predation, Crops, Home invasion
Ground Squirrel	Pasture, Rangeland, Gardens, Crops (forage, grain, fruit, nut)
Voles	Trees, Shrubs, Crops (field & garden)
Moles	Burrowing (turf, pasture, crop fields)
Rabbits & Hares	Landscape plantings, Gardens, Crops, Rangeland, Trees, Shrubs
Tree Squirrels	Trees, Shrubs, Plantings, Nuisance, Power lines
Woodrats	Fruit, Seed Crops, Herbaceous & Woody Plants, Nuisance
Commensal rodents	Grain Crops, Birds, Livestock, Property damage, Burrowing

Rodents and Other Small Mammals

- ▶ Damage is frequently difficult to measure; most species are nocturnal and not easily observed. Characteristics of damage may provide clues. Quantification of damage is often made by comparing the damaged site with an undamaged area, then converting the losses to dollars.
- ▶ Damage to plants may be generally grouped as:
 - Root damage
 - Trunk debarking
 - Stem & branch cutting
 - Needle clipping
 - Debudding



Examples of Control Techniques

- ▶ Habitat Modification
- ▶ Cultural Practices
- ▶ Exclusion
- ▶ Frightening Devices
- ▶ Removal
- ▶ Biological Management
- ▶ Fertility Control
- ▶ Repellents
- ▶ Fumigants
- ▶ Toxicants

Habitat Modification and Cultural Practices

- ▶ Elimination of food and shelter
- ▶ Provision of alternative foods
- ▶ Remove brush, debris, woodpiles, garbage, refuse, tall vegetation
- ▶ Remove insect and invertebrate food supplies
- ▶ Mechanical devices

Exclusion

- ▶ Installation of barriers that prevent access to structures or areas, or eliminate contact with specific objects
- ▶ “Rodent proofing”



Biological Management and Fertility Control

► Biological Management:

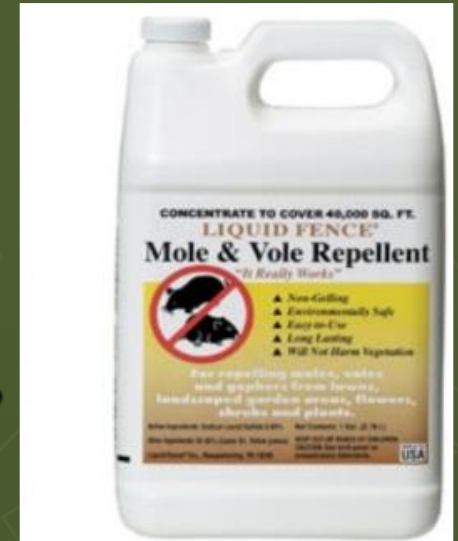
- Introduction of agents of disease and predatory species. Be careful, historically has led to dire unintended consequences (e.g., mongoose).

► Fertility Control:

- In time may be an effective supplemental tool. Oral and immunological agents are being developed as are viral-vectored immunocontraceptives.

Repellents

- ▶ Repellents are most effective when applied to foods
- ▶ Several compounds are registered for use, however; efficacy data is often lacking
- ▶ Chemical repellents include:
 - Sensory repellents
 - Semiochemical odors
 - Taste avoidance behavior compounds



Fumigants and Toxicants

- ▶ Fumigants are used for lethal control of burrowing mammals. Examples include smoke-producing gas cartridges, aluminum phosphide, choloropicrin, and methyl bromide
- ▶ Toxicants are labor and cost efficient, and are the most commonly used method of control. Potential hazards to non-target wildlife must be considered prior to use. Two types of toxicants are commonly used
 - Anit-coagulants
 - Non-anti-coagulants

Removal

- ▶ Foothold traps are commonly used to trap beaver, muskrat, and nutria; smaller sizes are used to capture small mammals. Body gripping traps are used for beaver, muskrat, nutria, moles and pocket gophers. Snap traps are typically used to control rats and mice. Snares may be used to capture or kill beaver, rabbits, and other animals.



Shooting may be used to selectively eliminate some pest mammals

Live traps are often used to capture mammals of all sizes

SUMMARY

- ▶ Wildlife Damage Management is an increasingly important part of the wildlife profession because of expanding human populations, intensified land-use practices, increasing prominence of wildlife vectoring disease, and other reasons.
- ▶ Many species at one time or another require management actions to reduce conflicts with people, livestock, or other wildlife species.
- ▶ There are few “silver bullet” easy remedies.
- ▶ Integrated Wildlife Damage Management Strategies, using a variety of techniques to dynamically target problem individuals or species are usually preferred and most effective for long-term management.