

## **Johnson County Park and Recreation District** **Guidelines for Responding to Nuisance Wildlife Problems**

Wildlife resources provide many positive values for society. Recreational, scientific and ecological values are particularly important in park areas. Unfortunately wildlife may occasionally cause conflicts. Those conflicts may be property damage, human injuries or illness caused by wildlife-related diseases or ecological changes caused by animal overabundance. Wildlife damage in parks can become a major problem for park managers. Unless those conflicts are properly addressed, public support for outdoor recreation and wildlife management may decline. Implementation of a strategy for wildlife damage management is prudent. Selection of the proper techniques to prevent and control wildlife damage is subject to considerable discussion. The public cares about the treatment of wildlife and may not understand wildlife damage management. There is no single or simple remedy that can be relied on to resolve all types of wildlife damage. This section of the biodiversity plan provides suggestions for prevention and control of damage caused by some species of wildlife.

Park managers must first decide if control is necessary. Several variables may affect that determination. Those may be best identified by asking a series of questions. Is the animal positively identified as being the species causing the damage? How much damage might occur without any control? What is the aesthetic or recreational value of the species involved? What are the benefits of control vs. the cost of the damage? What are the likely ecological consequences of this action? Is the action safe, practical, humane and legal?

Once those variables have been considered, there are usually several options to resolve the problem. Ideally we can prevent or repel the animal or change its habits in a way that will not endanger humans, pets, other wildlife or the environment. Some problems can be resolved indirectly by manipulating the wildlife habitat without resorting to chemicals or traps. All strategies used to prevent and control damage caused by wildlife will use an integrated approach using a wide variety of techniques such as:

- information and education through news media, brochures, park signage, park programs and presentations
- proper land, water and vegetation management
- repellents
- dispersal
- natural controls
- hunting and shooting
- trapping
- selective use of chemicals

Many species are well adapted to exploit the resources in urban areas and develop growth patterns caused by the same factors. Few natural large predators are found in urban areas. Excellent habitat is provided by some landowners and many park or natural resource areas. That habitat quality allows improved reproductive success, higher survival rates and longer life spans for wildlife. Most problematic species tolerate human presence and activities and benefit from those actions. Hunting is generally not allowed which contributes to

overabundance and tolerance to humans. Members of the public that relocate wildlife or artificially feed wildlife are contributing to the overabundance. Such activities should be halted.

Wildlife are protected by federal and state law even if they are considered a nuisance. Some species can be controlled without consultation with federal authorities. Consultation with the required state and federal regulatory agencies will be required before implementing actions covered in this document. Other government entities may need to be consulted prior to using some of the control options.

An ecological approach using systematic, biological measurements for habitat evaluations will help determine if control is necessary. Monitoring procedures for key indicator species will be developed and implemented for all parks. Management options will generally be applied in the order in which they are listed or until public carrying capacity and park tolerance is achieved. Unusual circumstances or emergency health hazards may dictate that control options may not be always applied in sequential order. White-tailed deer and Canada geese are often managed on a population level. Problems with raccoons, beaver and skunks are usually managed at the individual animal level rather than the population.

## **I. WHITE-TAILED DEER**

### **A. Typical Problems Caused by White-Tailed Deer**

Overabundance of white-tailed deer in urban areas can affect the distribution or abundance of many other species. If the population continues to increase or remains static, vegetative diversity will decrease. Surviving plants will be shade tolerant or unpalatable to deer or able to quickly re-grow after repeated browsing. Lower density stands and trunks with multiple stems may result. Eventually plants that develop chemical or physical resistance to grazing will dominate. Other parks with overabundant white-tailed deer have observed declines of almost 30% in species richness and abundance of intermediate canopy nesting birds. Ground nesting bird success will decline but canopy nesting birds will be unchanged. Heavy browsing will change the food web by causing interactions between hard mast availability, small mammals and insects. Deer herd health will decline. We will notice unusual losses of adults and fawns. As fat reserves are depleted, deer will die at a younger age. After several years we would expect sharp declines in recruitment, antler development, body weights and nutritional levels. Deer vehicle collisions will increase as deer populations increase.

### **B. Nonlethal Options to Reduce Deer Complaints**

- 1. Ban Feeding:** Feeding deer serves to improve deer reproductive success, make them more tolerant to human presence and may serve to concentrate deer in areas where they are unwanted.
- 2. Select Less Preferred Landscape Plants:** Habitat manipulations such as changing species of trees and shrubs into something that deer are less likely to damage is a long-term process. When food is scarce, deer will eat just about anything. Johnson County Park and Recreation District is in the process of developing a plant preference list for deer to be used in future plantings.

3. **Repellents:** Repellents are best suited for small areas such as individual flowerbeds or small yards. Repellents work best when preferred food resources are abundant. High application costs, label restrictions and weather resistance are problems that have not been overcome when implementing an effective management program.
4. **Hazing and Frightening:** Several techniques can be used to frighten deer away from areas where they are unwanted. Pyrotechnics (fireworks) cause quick, but temporary, fleeing reactions from deer which may cause them to flee into adjacent neighborhoods or highways. Unfortunately, deer and other wildlife also grow accustomed to unusual disturbances. Once deer are using an area, they become much more difficult to disperse by hazing. The noise level would cause numerous neighborhood complaints.
5. **Fencing:** Fencing is one of the best long-term solutions to control deer movements and works well for small critical area protection. Fencing will do nothing to control existing deer numbers. Fencing may restrict movements of other wildlife and people who wish to utilize the park. Rough terrain, multiple watercourses and the potential for deer entanglements make fencing large areas impractical. Studies have shown most people would prefer to observe wildlife in their natural habitat, not in wire pens.

### **C. Population Reduction Options**

1. **Controlled Hunting:** Hunting programs are among the most effective damage control techniques known to reduce deer damage. Hunting in public areas requires foresight, careful planning and commitment by everyone. Hunting is conducted safely in many other states and public parks. To be effective over the long term, harvest must focus on adult female deer. Implementing a public hunting program would have minimal costs to implement, provide controlled access to a natural resource and reduce damage. Public concern over hunting in areas that have previously been protected will occur. Additional restriction on hunting such as mandatory advanced hunter education programs and minimum skill proficiency standards can minimize public concern. The park or selected areas of the park could be closed to avoid interactions between hunters and the public. Selection of hunting techniques such as archery or shotgun-only areas depends on local circumstances and desired level of hunting efficiency. Archery hunter success rates are lower than with firearms. Wounded deer may travel off park property. After recommended population levels are achieved, archery hunting may be the preferred method of maintaining herd levels.
2. **Sharpshooting:** Use of sharpshooters has proven to be an effective way for communities to reduce their deer herd. This method is controversial as the public has many misconceptions about the technique. The community would control operator actions via contractual agreements. Types of equipment allowed and specific shooting locations would be determined by park staff in cooperation with the contractor to minimize risk to the public and park neighbors. Most shooting would be done from elevated platforms into baited areas at known distances from the shooter. Shots are not taken at distances of more than 50 yards. Shooters

would be trained marksmen who have met specific shooting proficiency standards. This method could involve sound suppressed firearms. Shots would be restricted to brain or spine shots that would ensure a quick humane death. Contractors would be responsible for processing the meat and distributing it to local food pantries. The cost of sharpshooting deer ranges from \$150 to \$400 per deer removed.

3. **Trap and Euthanize:** This technique can be used where concerns about the discharge of firearms cannot be conducted in a safe or efficient manner. Many of the same concerns exist as for the trap and relocation option. Deer would be captured or herded into nets, cages or pens. Deer that are to be euthanized with captive bolt equipment (used in livestock processing plants) need to be individually restrained, which greatly increases the animal's stress. This method would allow consumption of the meat. Communities that have utilized this option report costs of over \$300 per deer removed.
4. **Trap and Relocate:** Capture using nets, cages or via chemical immobilization has proven to be impractical, stressful to the deer, expensive and result in high deer mortality post release. Relocation would also require suitable areas offsite for release. The Kansas Department of Wildlife and Parks will not allow for relocation deer into other areas of the state. However, other communities in other states have utilized this option. Chemical immobilization would not allow use of the deer meat. One study reported 85% mortality after one year for deer captured and released at a cost of \$431 per deer. Other studies have recorded costs ranging from \$400 to \$2931 per deer removed. Mortality rates from capture efforts range from 0 to 30% in white-tailed deer.

#### **D. Experimental Options**

**Fertility Control Agents:** Interest in controlling deer populations with oral contraceptives began almost 50 years ago. Contraception is a temporary technique that stops ovulation or fertilization. Contraception can be done by giving the deer a pill orally, implanting a device beneath the skin of the deer or administering a shot. The approach was abandoned due to lack of safe, effective drugs and means of delivery. Current techniques require handling deer individually, which creates animal stress. Immunocontraception is another way to reduce fertility of deer. This method injects a liquid drug through a shot or dart gun, which makes it more practical to deliver. The vaccine causes the female deer to go into repetitive estrous cycles, which alters the behavior of both male and female deer and may cause more late born fawns. These experimental techniques offer promise, but do not address the existing problem of overabundance. It would take several years before the current populations decline due to other mortality factors. Fertility control is costly, ranging from \$200 to \$1000 per deer.

## **II. CANADA GEESE**

### **A. Typical Problems Caused by Canada Geese**

Large flocks of Canada geese can compact soil and denude an area of vegetation. This may lead to increased erosion and decreased water quality. An adult Canada

goose excretes about one pound of fecal material each day. The ecological consequences of the fertilizer load from a large resident flock of geese in aquatic systems results in eutrophication of lakes and ponds. The algae and fecal material in the water reduces plant and animal diversity in the water and decreases oxygen concentration. Low oxygenated water bodies often have objectionable odors associated with them. Canada geese can transmit diseases such as coccidiosis, avian influenza, chlamydiosis, salmonella and avian cholera to other species.

Canada geese are federally protected by the Migratory Bird Treaty Act, administered by the U.S. Fish and Wildlife Service. In order to trap, kill, relocate, or otherwise handle a goose or its eggs, a Federal/State permit is required. Permit applications are processed by the U.S. Fish and Wildlife Service and the Kansas Department of Wildlife and Parks.

## **B. Nonlethal Options To Reduce Goose Complaints**

- 1. Discontinuance of Feeding:** Feeding of geese is a popular pastime for many people but also contributes to higher urban populations during winter when natural food sources are limited. Elimination of food handouts for urban geese is essential if geese are to be dissuaded from using a site. Canada geese are grazers and do not need handouts to exist. Feeding geese tends to concentrate them and make them more aggressive towards humans.
- 2. Landscape Modification:** Geese prefer to graze on grasses that are mowed and fertilized because it has the highest nutritive quality. Reduce or eliminate mowing and fertilizer use. Adding a growth regulator can keep the grass from growing as rapidly. New plantings of grass areas should utilize grass varieties that are less preferred by geese such as warm season grasses or forbs. Place any new soccer, baseball or football fields at least 450 feet away from water to reduce goose use of the field during molting. Eliminate or reduce the area of straight shoreline, islands or peninsulas. These type areas provide security and a good view of predators for geese and are preferred nesting sites. Steepen the shoreline on areas that exhibit persistent problems. Allowing vegetation to grow tall along this slope will help protect it from erosion and keep the geese from walking up. Rip-rap, while ineffective on gentle slopes, is often effective on steeper ones. Allow ponds to freeze over during winter. Aeration devices may improve water quality but tend to keep geese from migrating. Although there will be some complaints about the presence of goose droppings, place walking paths along the edge of ponds to disturb the geese. Keep in mind urban geese can tolerate an incredible amount of human activity.
- 3. Exclusion:** Restriction of the ability of geese to move between water and land will deter geese from an area. Although geese can fly over the barrier, this technique is particularly effective during the molt and will protect the public during nesting season. Fencing should also be used on high value areas where geese tend to forage. Short fences, vertical banks, large rocks or dense shrubs around the pond edge are usually adequate. On small bodies of water, an overhead high tensile wire grid system can be installed about 3-4" above the water surface. This flight hazard usually deters geese from using a pond. Spacing

the wires about 20' apart allows smaller waterfowl and shorebirds to use the ponds. Remove any artificial nesting structures.

4. **Harassment:** Harassment may prevent damage but seldom stops it once it is occurring. Using dogs to harass geese from an area has become a popular and successful technique. Because strict control of the dog is necessary, this technique should only be allowed by trained and experienced people. The dog is allowed to enter an area and chase but not catch the geese. Geese will likely seek refuge from the dog in a nearby body of water. The dog handler can also use pyrotechnics to further harass the geese. Harassment should continue and be repeated until the geese leave the area permanently. Low-power, long-wave length lasers (630-650 nanometers with red beams) can effectively disperse some problem bird species under low-light conditions. Canada geese have shown extreme avoidance of laser beams. Pyrotechnics are specially designed Class C fireworks that are used to frighten wildlife. These can include screamers, bangers or shell crackers. People using the pyrotechnics should wear eye and ear protection and be well trained in their use. Harassment techniques are usually successful if they incorporate several different stimuli on a persistent basis.
5. **Repellents:** There are several chemical repellents registered for goose control. Effectiveness of repellents varies due to weather, repellent concentration and frequency of application. Methyl anthranilate products (artificial grape flavoring) include: ReJeX-It, Migrate, GooseChase and Goose-B-Gone. These products make the grass less palatable. They persist after rainfall but must be reapplied after mowing. Geese may still frequent the treated area, but they will not feed there. Anthraquinone is the active ingredient in Flight Control. That product repels geese by causing gastric distress and changing the ultraviolet color spectrum of the turf. Flight Control will not wash off after a rain, but needs to be reapplied after mowing.
6. **Relocation:** Removal and relocation of nuisance flocks is costly, labor intensive and requires a special permit. The easiest method is to trap geese using a funnel trap during June and July while they are molting and unable to fly. The Kansas Department of Wildlife and Parks (KDWP) manages some reservoirs in the western part of the state that will accept relocated geese. Relocated adult geese often return to the site of capture or another urban area.

### **C. Lethal Options**

1. **Legal Hunting:** Hunting can be an effective control technique to reduce resident populations and deter geese from some areas. Hunting tends to make harassment efforts much more effective. Special early goose seasons have been structured to allow the take of resident Canada geese that may cause problems before the migrants arrive. All hunting must comply with local, state and federal regulations.
2. **Egg Oiling/Addling:** Egg addling or oiling prevents the embryo from developing. This slows the rapid growth of local goose populations and eliminates the aggression of adult geese protecting their young. This technique works best at keeping small populations small. It may take 10-15 years for the old geese in the

flock to die from other mortality causes. Because geese are federally protected, permits are required for egg and nest destruction activities.

- 3. Fertility Control Agents:** A product (OvoControl G) is registered by the EPA to reduce hatchability of the eggs from resident geese. The active ingredient is nicarbazin, originally used as a drug to control an enteric disease in chickens. This is a new product without much data to support efficacy. It may be suited for large scale sites and/or where goose nests may be difficult to locate or access. Bait must be placed throughout the breeding season. Product may take 10-15 years to see the result.
- 4. Trapping, Removal and Euthanization:** Although this option is allowed by federal authorities, KDWP is not issuing permits as relocation options exist. Banded geese that return to the site of capture may be euthanized with authorization from KDWP.

### **III. RACCOONS**

#### **A. Typical Problems Caused by Raccoons**

Raccoons are opportunistic and will raid pet food, get into improperly covered garbage cans, establish dens in chimneys and plug them with nest material and tear off shingles or fascia boards to enter an attic or wall space. Raccoons contract a number of diseases and carry fleas, ticks and lice. Distemper occasionally causes raccoon numbers to decline. They often are exposed to canine, feline and porcine parvovirus, but to date there is no evidence that raccoons have transmitted this disease to pets or livestock. In Kansas, only about five percent of raccoons have been exposed to rabies. Exposure means that those tested have rabies antibodies in their blood, indicating they have been attacked but not killed by the virus and they cannot infect other animals. Raccoons are extremely resistant to the skunk-strain rabies common in the Midwest. Recently there has been concern about the raccoon roundworm, (*Baylisascaris procyonis*). Park users who accidentally touch the feces might be exposed. Roundworms have been found in more than 65 percent of the raccoons tested in Iowa. Humans are infected by ingesting eggs contained in the feces, possibly by not washing hands after working in or being around a contaminated area. Clinical symptoms depend on how many larvae there are and where they migrate. Larvae migrate to various tissues but cause problems when they enter the eyes or brain. Most adults do not ingest enough eggs to cause brain disease.

#### **B. Nonlethal Options to Reduce Raccoon Complaints**

- 1. Food and Cover Reduction:** Feeding raccoons is popular with some park users. Preventing feeding of wildlife will reduce raccoon problems. Make sure garbage containers are sealed tightly. Chimney caps are important to prevent easy access into buildings or structures. Remove trees growing next to the structures. Seal up all holes along the foundation and under steps.
- 2. Repellents:** Kansas has several products registered as repellents for raccoons. Most are capsaicin (hot pepper) based but one is methyl nonyl ketone. Use of these chemicals may encourage raccoons to leave the area so that other exclusion techniques can be implemented.

- 3. Frightening Devices:** Because raccoons are nocturnal, using various frightening devices such as lights, noise makers or playing a radio during the night can reduce damage to structures. These methods are not effective long-term because raccoons adapt to them.

### **C. Lethal Options**

- 1. Trapping and Euthanasia:** Trapping can be effective at removing the problem animals. Raccoons are relatively easy to catch in traps. Cage-type live traps are the best way to capture problem raccoons, especially in an urban setting. A 12 by 12 by 36-inch single-door live trap baited with fish, fish based pet food, meat or eggs are sufficient. Because raccoons are very strong animals, it is a good idea to anchor the trap firmly in place.
- 2. Trapping and Relocation:** The public often prefers to release raccoons unharmed in a distant location, “where the animal can find a good home”. Recently, there has been growing opposition from professional wildlife biologists to relocating wild animals because of the possibility of introducing diseases from one population to another, high mortality, reoccurrence of the problem and impacts to resident wildlife in the relocation area. There are no conservation benefits at the population level.

## **IV. BEAVER**

### **A. Typical Problems Caused by Beaver**

The flooding from beaver dams can result in the inundation of large areas with deep standing water where once only shallow, slow-moving water existed. Flooding can remove grass areas and drown stands of trees. Flooding may also threaten public safety by compromising the integrity of levees, dikes, roadways, bridges, and trestles through saturation of the soil with water. Dens can pose risks by undermining the integrity of a water-holding structure or collapsing under the weight of mowing equipment. Beavers prefer to fell small trees from two to six inches in diameter but have been known to cut trees up to three feet in diameter. They can also harm even larger trees by stripping off the tree bark, in a process called “girdling.” Even if the beaver fails to girdle the trunk’s circumference completely, the damaged tree may still die or fail to thrive.

Beavers create wetlands, which are highly valuable ecosystems for many species ranging from fish to waterfowl to people. Although the beaver may be abundant, species that rely on beaver for wetland creation are declining. Solutions for beaver damage may be more complex than those for other species.

### **B. Nonlethal Options to Reduce Beaver Complaints**

- 1. Water Level Control Devices:** While an important option for controlling beaver damage, these devices have some limitations. They protect trees from flooding but not cutting or girdling. Pipes are effective only in areas that can tolerate some flooding (i.e. spring and heavy rains) and maintain at least three feet of water depth or a minimum of 18 inches of water under the ice. Pipes tend to fail in drainage ditches or flat canals. However, when used with fencing, they can be very effective in protecting culverts from beaver damming. It is important to note

that pipes and fencing are not maintenance-free. Inspect them in spring and fall to repair damage and remove floating debris that may have collected around the pipe or fencing. Considerable experience is necessary to properly design, size and install an effective water level control device.

2. **Exclusion:** A three foot high welded wire fence wrapped loosely around trees and shrubs will prevent beaver from gnawing on them. This barrier will have to be re-adjusted as the trees grow.
3. **Repellents:** Some research suggests that painting the lower three feet of tree trunks with a mixture of paint and mortar sand will deter beaver from chewing the trees. Beaver castor from another area is sometimes spread on outlet pipes in an attempt to frighten new beaver from the area.
4. **Trapping and Relocation:** Cable restraints can be set to capture beaver for relocation. Several other types of cage or suitcase traps can also be used to capture beaver. Many of the same problems such as reoccupation of the preferred habitat, disease concerns and lowered survival exist for the relocation of nuisance beaver as for other animals.

### **C. Lethal Options to Reduce Beaver Complaints**

**Trapping:** Trapping can be used in combination with other control options or used by itself. It may be the best solution when a culvert cannot be replaced with an oversized model. Keep in mind that other beaver will eventually move into the area. This may require trapping on a regular basis. Trap as close to the site of the damage as possible. Body-gripping traps or cable restraints with a submersion set are perhaps the best lethal options to use for beaver in an urban setting.

## **V. SKUNKS**

### **A. Typical Problems Caused by Skunks**

Skunks cause many problems in urban areas. They damage turf by digging for grubs; den under patio slabs, steps, crawl spaces, outbuildings and in basements; release highly objectionable musk; and may carry rabies. In Kansas, skunks are the primary wildlife carrier of this disease. They may also be infected with pneumonia, distemper, leptospirosis, listeriosis, tularemia and unknown viral diseases, or carry parasites such as fleas, lice, mites, ticks, roundworms, tapeworms and flatworms.

### **B. Nonlethal Options to Reduce Skunk Complaints**

1. **Habitat Modification:** Clean up and destroy dens and remove food sources by taking away exposed food from pets or garbage. Eliminate areas that are harboring small rodents. Control grubs in turf in high use areas.
2. **Exclusion:** Block den openings in foundations and under steps using concrete with sheet metal or wire netting bent outward 12 inches at the bottom in an “L” shape. This prevents skunks from burrowing. Destroy other den sites such as rock piles and open buried culverts or pipes.
3. **Repellents:** Several repellents are registered but none have been effective long-term at removing skunks.

### C. **Lethal Options**

1. **Fumigants:** Two types of gas cartridges are registered for fumigating skunk burrows. Fumigation kills skunks and any other animals present in the burrows by suffocation or the introduction of toxic gases. Follow label directions and take care to avoid fire hazards when used near structures.
2. **Trapping and Euthanasia:** Live-trapping with cage traps baited with fish-based, meat-type cat food, canned fish, chicken parts or sardines is the preferred method for removing nuisance skunks. Skunks can be caught in live traps set near the entrance to their den. Before setting live traps, cover them with canvas or heavy cardboard to reduce the chances of a trapped skunk discharging its scent. The cover creates a dark, secure environment for the animal. Always approach a trap slowly and quietly to prevent upsetting a trapped skunk. Gently remove the trap from the area and euthanize the trapped skunk. If the skunk is to be killed, the US Department of Agriculture recommends shooting or euthanasia with CO<sub>2</sub>.

D. **Odor Control:** Skunk odor is difficult to neutralize and persists for a long time. A deodorizing solution that can be mixed from readily available ingredients is as follows:

- 1 quart 3% hydrogen peroxide
- 1/4 cup baking soda
- 1 teaspoon liquid soap

Mix ingredients well and thoroughly saturate the areas the skunk has sprayed. Use immediately and do not store the mixture or keep it in a glass container. It expands and will break sealed containers. Be aware these solutions may cause color changes in certain materials. In treating pets, keep solutions away from their eyes.

E. **Rabies:** Skunks exhibiting any sort of addled, tame or aggressive behavior, especially during the day, are definite rabies suspects. Park users should be warned against handling “friendly” skunks. Animals suspected of having rabies should be destroyed immediately—try not to destroy the brain. Have a veterinarian remove the head and submit it, packed in ice in a sealed leak proof container, to the Veterinary Diagnostic Laboratory, Kansas State University, Manhattan, Kansas 66506. A test will be performed, and the veterinarian will be contacted immediately by phone if the animal is positive for rabies.

F. **Human Rabies Prevention:** Rabies in humans can be prevented either by eliminating exposures to rabid animals or by providing exposed persons with prompt local treatment of wounds.

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