Developing Standard Operating Procedures for Wildlife Damage Management Activities in Urban and Suburban Areas in Southern Nevada

Jack W. Sengl
USDA APHIS Wildlife Services, Las Vegas, Nevada
Jack O. Spencer Jr. and **Zackary L. Bowers**
USDA APHIS Wildlife Services, Reno, Nevada

ABSTRACT: Urban and suburban areas of southern Nevada are affected each year by a wide variety of wildlife species that cause damage to property and cause concern for human health and safety issues. Integrated wildlife damage management practices are employed in cases where technical assistance and direct control measures are used to resolve problems with wildlife. Nevada's daytime temperatures often exceed 115°F (46°C); therefore, traditional management practices have evolved to match the climate. Nevada is currently the fastest-growing state in the nation, so wildlife damage management practices are ever changing. The increase in urban sprawl provides additional food and habitat availability for several species of wildlife. Anthropogenic food sources produce an unnatural environment. Wildlife damage management activities are therefore needed to resolve a variety of conflicts. These standard operating procedures for wildlife damage management in urban areas were developed to better manage wildlife complaints. Wildlife species collected during damage management activities are tested for various diseases and contaminants.

KEY WORDS: alpha-chloralose, anthropogenic resources, Centers for Disease Control and Prevention, predators, standard operating procedures, University of Nevada–Las Vegas, urban sprawl

Proc. 23rd Vertebr. Pest Conf. (R. M. Timm and M. B. Madon, Eds.)
Published at Univ. of Calif., Davis. 2008. Pp. 201-205.

INTRODUCTION

The Las Vegas Valley (LVV) has experienced a dramatic human population increase. In 1997, the population was 1,123,932, which grew to 1,925,261 by 2007 (Clark County 2008). This increased growth has displaced wildlife (e.g., desert tortoise, *Gopherus agassizii*) in some areas, and has increased wildlife populations in others. For example, lush golf course vegetation draws in lagamorphs, particularly desert cottontail rabbits (*Sylvilagus auduboni*), which multiply, attracting coyotes (*Canis latrans*) and bobcats (*Lynx rufus*), which in turn exploit the rabbits and supplement their food supply with pets. As a result of this dynamic situation, a large human population is frequently requesting assistance to mitigate the associated conflicts and damage. Currently, only two USDA Wildlife Services (WS) wildlife biologists are available to respond to wildlife complaints in the LVV. This mismatch between needs and human resources necessitated a modification to existing standard operating procedures, in order to serve the public more effectively and efficiently.

Site Description

The Las Vegas Valley is located in extreme southern Nevada (36°11'39"N, 115°13'19"W), with the urban area covering roughly 600 square miles (1,600 km^2) at an elevation of 2030 feet (620 m) (Wikipedia 2008). The arid desert climate temperatures vary from the extremes of 0°F (-18°C) (January 1963) to 121°F (49°C) (July 1972) (Weather 2008). Average annual precipitation is 4.5 in (114 mm) (Wikipedia 2008). Vegetation varies from creosote bush (*Larrea tridentata*) to lush golf course greens grass (Creeping bentgrass, *Agrostis palustris*).

Most Commonly Reported Species Causing Damage

Lagamorphs

Prior to urbanization, the desert environment had a lower carrying capacity for lagamorphs, as their populations were constrained by water and food resources. As urbanization began, both constraints were loosened as new residences brought grasses and other horticultural plants along with irrigation water to the naturally arid setting. Golf courses and resorts followed as the tourist industry flourished, providing a utopia for adaptive wildlife species. This situation has enabled lagamorphs to substantially increase their numbers. It appears these rabbits and hares prefer the human-altered habitat to their native unaltered desert environs. Golf courses and landscaped yards provide habitats that have richer, more constant resources, as landscape irrigation continues throughout the year for reasons of revenue and aesthetics. With increased populations, lagamorph-associated damage has also increased. For example, one LVV golf course reported $101,000 of direct damage caused by desert cottontail rabbits in one year from digging up greens and burning greens with their urine (S. Trudell, USDA, pers. commun. 2008). In addition, the rabbits caused $51,000 of damage to ornamental shrubbery and drip irrigation systems at the same golf course.

Predatory Wildlife

As with lagomorphs, predators caused less damage to LVV personal property prior to urbanization. As desert cottontail rabbit and Gambel's quail (*Callipepla gambelii*) numbers increased due to human influences, predators such as coyotes and bobcats adapted to the conditions and have flourished. When lagamorph pres-

ence decreases during the winter, urban pets fill the prey void. The most commonly reported predator damage in the LVV is predation on pets and accompanying threats to human health and safety, which likely occurs as predators lose their wariness toward humans and realize that pets often require less handling time than their natural prey items.

Non-Native Species

Rock doves (*Columba livia*), also known as feral pigeons, are essentially human obligate species, feeding upon the refuse, livestock feed, and handouts from people. As the urban human population increases, pigeon populations respond to the increase in urban resources. The most commonly reported damage associated with pigeons is accumulation droppings, with the concurrent potential for disease. Most pigeon problems are handled by technical assistance or passed on to local pest control operators.

Feral cat (*Felis domesticus*) populations in the LVV have also increased as owners fail to maintain possession of them and/or fail to have them neutered. There are an estimated 200,000 feral cats in LVV (Anonymous 2008), which not only vector disease such as plague to other pets and wildlife that they contact (Fitzwater 1994), but also compete with native predators for food. Feral cats prey upon a wide variety of small vertebrates, such as the endemic Palmer's chipmunk (*Tamias palmeri*), and they also serve as prey for coyotes and bobcats, drawing them in closer proximity to people. The most commonly reported damages associated with feral cats are threats to native species, threats to domestic pets, and their potential for disease transfer, as well as being a general nuisance.

Migratory Birds

Las Vegas is well known as a tourist attraction. Over-abundant resident waterfowl species (e.g., American coot, *Fulica americana*, and mallard, *Anas platyrhynchos*) defecate in swimming pools, which forces resort/casino owners to manage the damage associated with these problematic species or risk penalties from the Southern Nevada Health District, such as closure of swimming facilities because of fecal material and the associated elevated level of coliform bacteria. American coots are attracted to golf courses, which provide a sustained food source that is close to shelter (water hazards). One local golf course reported observing over 10,000 coots utilizing their golf course during the winter of 2006. The most commonly reported damage associated with coots is damage to the greens while feeding (pecking holes and burning the greens with fecal matter), and defecating on the course. Golf courses have different damage thresholds, as some are equipped with expensive feces-blowing and scraping machines, while others are not. The damage is difficult to estimate in dollar figures, as golf courses rarely report cost of equipment (such as blowers) required to mitigate the damage or losses in revenues due to patrons not willing to play on a course where their ball is likely to roll through feces.

Mallards are attracted to golf courses for reasons similar as coots, but on a much smaller scale. One niche they often occupy is hotel resort swimming facilities and nature displays. One resort has a nature area that contains flamingos and other exotic waterfowl; the most commonly reported concerns are the threat of disease transmission to exotic species, and consumption of feed.

Common Raven

In some areas of the West, raven (*Corvus corax*) populations have increased by 500% to 7,600% from 1968 to 1992 (Boarman and Berry 1995). There are several landfills in the LVV that provide supplemental food for ravens. Ravens have been verified feeding and loafing at these sites by area biologists. As local raven populations increase due to supplemental feed resources, they could potentially adversely affect the endangered desert tortoise recruitment, as ravens may prey upon juvenile tortoises and their eggs. Local NDOW personnel also have witnessed ravens chasing Rio Grande turkey hens (*Meleagris gallopavo intermedia*) from nests to prey upon their eggs and chicks. Research in other portions of the country has shown that the removal of nest predators can have a dramatic benefit for nesting birds (USFWS 1994).

The most commonly reported damages associated with ravens are predation upon juvenile desert tortoises, damage to construction sites (pecking on insulation and defecation), damage to houses (defecation on roofs and decks), consumption of agricultural products (e.g., pistachio nuts in orchards), and nuisances to residents, mainly from droppings.

STANDARD OPERATING PROCEDURES (SOPs)

Each year, USDA Wildlife Services in LVV receives over a thousand wildlife complaints. Each complaint is addressed on a case-by-case basis. When dealing with wildlife complaints, WS biologists must narrow the complaint to the exact species responsible. Complaints may be lodged by the LVV public, casinos, resorts, golf courses, homeowner associations, airports, private pest control companies, military, and municipalities or other government agencies. After gaining an understanding of what the human-wildlife conflict is, WS provides either technical assistance (TA) or direct control (DC), as appropriate, in resolving each wildlife complaint. TA is an educational effort, where the WS biologist assists the complainant in understanding and resolving their own problem by use of approved, non-lethal methods. DC occurs when the complainant cannot resolve their problem simply with technical assistance. DC requires a minimum of one site visit by the WS biologist, securing written permission from the property manager or owner, and then proceeding to resolve the problem. The following SOPs are how we achieve this goal.

SOP

1) Field the complaint call.
   Record the caller's contact information.
   Record the location of damage, to assist in obtaining an aerial view (e.g., from Mapquest.com).
2) Identify the conflict.
   Determine species responsible.
   Determine damage type.

Determine priority (Human health and safety direct threat? Nuisance? Concern?)

3) Who is the responsible managing agency and what are their policies concerning "affecting" the species?
   Threatened or Endangered species – United States Fish and Wildlife Service (USFWS)
   Migratory birds – USFWS or Nevada Department of Wildlife (NDOW)
   Furbearer – NDOW
   Domestic pet and rattlesnakes – local animal control agency
   Exotic pet – USDA Animal & Plant Health Inspection Service - Veterinary Services)

4) Resolve the problem.
   Conduct TA or DC, as appropriate. If DC, then perform a site visit, having the responsible land manager sign a cooperator's agreement with WS, stating what the species is targeted and what management method(s) will be utilized, as per WS policy.

It should be noted than when conducting direct control, there are often times when offending wildlife are captured, handled, and even occasionally are translocated within the LVV. In all cases, animals are treated as humanely as possible, by modifying our work schedule and direct control activities to reduce the amount of time involved in handling, and doing so during times of day when we can minimize stress that is elevated by the arid environment and warm daytime temperatures.

An Example of Technical Assistance

The following is a typical example of a situation in which TA is utilized to solve a problem.

1) The caller provides her contact information and the address where damage occurred. By "MapQuesting" the location, the WS biologist determines that the location abuts to the open desert.
2) The reported conflict is that the person's chicken coop was raided at night, with several laying hens missing, save a few feathers. The depredation event occurred between 10:00 pm and 1:00 am. The biologist asks the caller if she had seen the predator responsible. The caller replies yes, she had seen a mountain lion (*Puma concolor*) taking part of a chicken over a 6-foot concrete wall that separates her property from the desert. The biologist asks the caller to describe the mountain lion. She replies that it was big, with a long tail, adding that this description was provided to her by her neighbor. Then the biologist asks if she remembers how long the tail was, to which she replies "a good 10 inches with a black tip". She also explains that the 'lion' had tufted ears, just as her neighbor had described, and that its back was a good 2½ feet tall. The biologist tells her that her description most closely resembles a bobcat, which is managed by NDOW. She explained that she and her neighbors were concerned that the bobcat would return, as each neighbor had domestic ducks or chickens, and they would like the problem resolved. The biologist offered that providing technical assistance would be the best way to help them resolve the problem.
3) The biologist notes that bobcats are furbearers, which are managed by the Nevada Department of Wildlife.
4) The biologist has determined that technical assistance is most appropriate. The caller asks why someone can't just come, trap the bobcat, and relocate it. The biologist explains that relocating the bobcat would be in violation of NDOW policy. Trapping and euthanizing the bobcat would be only a last resort, to be used when all else fails and if human health and safety were imminently jeopardized. In this situation, it would be best to reduce the factors that attracted the predator to these properties, because if the present bobcat was removed, another bobcat would likely fill the vacant niche. Inasmuch as technical assistance would provide an opportunity to resolve current problem but also prevent future problems with bobcats and coyotes at this location, the biologist offers to visit in person in order to walk through the properties and provide site-specific recommendations. The woman replies that she and her neighbors will welcome the visit. The biologist visits the site and confirms via tracks that it was indeed a bobcat that had preyed upon the chickens. He explains to the homeowners what a lion track would look like, and then provides the following recommendations for resolving potential problems:
   a) protect the fowl by repairing the existing coop and erecting a 6-foot fence that ties in with the coop and concrete wall (with an overhead fence ceiling), so that the fowl have a protected area to move about.
   b) remove yard clutter to reduce potential shelter /ambush sites that predators may utilize.
   c) trim bushes to reduce cover for other prey items, such as rabbits.
   d) remove water sources and pet food, and secure garbage cans.
   e) provide dogs with a kennel, or keep them inside at night.
   f) provide backyard lighting to reduce the predators' comfort level at night.
   g) keep garage doors and sheds closed, unless being used.
   h) spend more time in the back yard and periodically move outdoor furniture around.
   i) if a bobcat or coyote enters the back yard, hit it with a blast of pepper spray or water from a high-pressure hose.

An Example of Direct Control

The following is a typical example of a situation in which TA is utilized to solve a problem.

1) The caller, a homeowners association (HOA) president, provides her contact information and the address of the damage location. By "MapQuesting" the location, the biologist realizes that the site abuts the foothills of the open desert and has several washes going through the area.

2) The reported conflict is that 5 coyotes have taken up residence in a common area of the homeowners association. The brazen coyotes' interaction with people is becoming unmanageable. Whereas at first they were just feeding upon rabbits and quail, the coyotes are now feeding upon pets, preventing residents from using their back yards and playground, taking pets off leashes while being walked by their owners, and following children. As this is classified as a human health and safety issue affecting a large number of adults and children, the biologist offers to meet with the HOA to investigate and provide recommendations technical assistance, and if necessary, direct control.
3) The biologist notes that coyotes are unprotected wildlife.
4) The biologist meets with the HOA and interviews residents who had been adversely affected by the coyotes, and inspects the area. Based on their responses, it became apparent that the coyotes were actually living exclusively within the gated community (as evidenced by tracks, fecal matter, and territorial scratch marks). A few of the interviewees had attempted to chase after the coyotes, until the coyotes began to hold their ground. When the biologist walked the common areas, he noticed that the xeriscape was not being properly maintained. Mesquite bushes had not been trimmed. As a result, the HOA had unintentionally created dense habitat for quail, rabbits, and coyotes. Dog food was also noticed in several back yards, which likely attracted the coyotes. The biologist informed the HOA that resolution of the problem would require both technical assistance recommendations and direct control.

Technical Assistance (TA). First, information on the general biology of coyotes was provided, to help the HOA understand the coyotes' needs and therefore how to reduce the resources in the neighborhood that were attractive to the coyotes. The mesquite bushes throughout the community would have to be properly trimmed, at least annually, to reduce cover (shelter) for prey species and coyotes. Food and water attractants, such as pet food and water dishes, should be removed, or at least reduced. Pets should be kept inside or kenneled at night. Playgrounds and backyards should be illuminated at night where possible. An adult should be present while children are playing on the "jungle gym" that is abutted to the xeriscaped common area.

TA alone would likely resolve the conflict, if the coyotes had not already established themselves and recognized people as being providers of resources, instead of potential threats. The HOA had allowed that they would follow through with the technical assistance, but they could not bring in landscapers until their safety could be assured. The biologist further recommended that children be closely supervised (particularly at night), that pets be kept indoors, and that common areas be off-limits until the problem was mitigated by means of direct control (DC).

Direct Control (DC). The biologist explained to the HOA that the safest/best DC method to resolve the problem would be through leghold trapping with soft catch traps. By removing 2 or 3 coyotes (particularly the alpha male), the remaining coyotes would, based on WS' previous urban experience, associate a threat with humans at this location and would relocate. Before proceeding, the HOA would need to discuss the problem, including the TA recommendations and the DC option, with the residents. If and when a common agreement was reached to remove 2 or 3 coyotes via trapping, the biologist would require the HOA to sign an agreement allowing the management action to be taken. Additionally, the biologist would need to be assured that pets would be kept indoors until the DC portion had been completed, and that residents would remain clear of the common area where the traps would be placed.

The HOA and residents agreed to the DC option and the biologist's terms and signed the private agreement form. The biologist explained to the HOA that WS would post a sign at each main entrance to the common area, alerting residents that wildlife capture devices had been placed in the area, and people and pets must be kept clear of the capture devices. Because the daytime temperature during that month exceeded 100°F, 3 leghold traps were placed under shelter of mesquite bushes where the HOA president could monitor the sites from the security of balconies. To further reduce the stress to captured coyotes, the traps would be checked daily by 7:00 a.m., and captured coyotes would be immediately euthanized. The biologist's cellular phone number was provided to the HOA to ensure that if there were any complications (such as capturing a pet), they would receive an immediate response. By showing the HOA president the location of the devices, she would be able to immediately report any mid-day coyote captures, so that the biologist could promptly euthanize the animal.

The DC portion resulted in 4 nights of trapping, with 3 coyotes being removed. After the DC portion was completed, landscapers trimmed the mesquite bushes. After 2 weeks, the HOA president informed the biologist that although coyotes were still observed in the nearby desert, they had not been seen in the community, nor had any pets been reported as missing. In short, the problem was solved. WS realizes that these urban environments will likely have additional coyote problems. By removing the problem animal(s) and recommending long-term, preventative measures, such as thinning of cover and removal of pet food, the likelihood of coyotes moving back into the area is reduced.

Waterfowl Translocation

One method used to capture waterfowl in the LVV that are causing damage is the use of the immobilizing

drug "alpha-chloralose" (USDA 2001). After a waterfowl species is immobilized, thermoregulation is severely reduced. To address this side affect of immobilization (particularly in an area where daytime temperatures commonly exceed 100°F), WS purchased a custom-made transport box that fits in the bed of a truck. The top, sides, and bottom panels of the box are made of insulated fiberglass-reinforced plastic. It is further fitted with electric exhaust fans near the top, to remove stale hot air, and is equipped with a 2½-inch-diameter flexible hose that attaches the box to the vehicle's air conditioning vent, allowing the biologist to monitor and adjust the internal temperature of the box. Captured birds are placed in this temperature-controlled box until they become responsive. They are then placed in pens at an approved translocation site, until they have completely recovered from the process and can be safely released.

In the future, some Canada goose (*Branta canadensis*) translocation projects may occur in the LVV, in which case additional equipment, such as a goose trailer, will also be utilized. Having the proper equipment helps prevent undue stress to the birds.

Disease Monitoring

In addition to translocating or euthanizing problem wildlife in the LVV, WS also collects samples for a variety of disease testing, including plague, West Nile virus, and avian influenza. County and state health departments usually do not have the budget or labor available to conduct sampling on a large geographic scale. Sampling problematic wildlife, which WS already has in hand while conducting routine wildlife damage management, is both cost-effective and beneficial to health departments and the public. If any of the samples are found to be positive, local officials can then take appropriate action to reduce potential disease threats.

SUMMARY

By working through this modified SOP, WS biologists are capable of providing assistance to a large human population effectively and efficiently. By this process, an emphasis is placed on resolving conflict instead of removing wildlife (the later is used as a last resort, typically for human health and safety situations). An additional benefit of this process, particularly in regard to residential neighborhoods and communities (as in the example of the HOA, above) is that the community is unified and empowered to making informed decisions to resolve the problems.

ACKNOWLEDGEMENTS

The authors thank Shaun Trudell and Luke Barto, Nevada Department of Agriculture; the Nevada Department of Wildlife, Las Vegas Valley Animal Control offices, Clark County agencies, Las Vegas Metropolitan Police Department, and the citizens of the Las Vegas Valley for their cooperation, assistance, and support.

LITERATURE CITED

ANONYMOUS. 2008. County commission tries to solve feral cat problem. WorldNow / KLAS-TV, Las Vegas, NV. http://blogs.lasvegasnow.com/nellis-sunrise/2008/08/19/886858/.

BOARMAN, W. I., and K. H. BERRY. 1995. Common ravens in the southwestern United States, 1968-1992. Pp. 73-75 *in*: E. T. LaRoe, G. S. Farris, C. E. Puckett, P. D. Doran, and M. J. Mac (Eds.), Our living resources: A report to the nation on the distribution, abundance, and health of and health of U.S. plants, animals, and ecosystems. U.S. Department of the Interior, National Biological Service, Washington, D.C.

CLARK COUNTY. 2008. Comprehensive Planning – Demographics. Clark County, Nevada. http://www.accessclarkcounty.com/depts/comprehensive_planning/demographics/Pages/demographics.aspx.

FITZWATER, W. D. 1994. House Cats (Feral). Pp. C45-C49 *in*: S. E. Hygnstrom, R. M. Timm, and G. E. Larson (Eds.), Prevention and Control of Wildlife Damage. Nebraska Cooperative Extension Service, Lincoln, NE.

USDA. 2001. Alpha-chloralose use guidelines and training manual. U.S. Dept. of Agriculture, APHIS, Wildlife Services, Operational Support Staff. 39 pp.

USFWS (U.S. FISH & WILDLIFE SERVICE). 1994. Final report: Control to enhance production of greater sandhill cranes at Malheur National Wildlife Refuge. BLM-USFWS-Malheur National Wildlife Refuge. 7 pp.

WEATHER. 2008. Monthly averages for Las Vegas, Nevada. http://www.weather.com/weather/wxclimatology/monthly/USNV0049.

WIKIPEDIA. 2008. Las Vegas, Nevada. http://en.wikipedia.org/wiki/Las_Vegas,_Nevada.