Human-Raptor Conflicts in Urban Settings

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DO YOU RECALL THE FIRST time you saw a raptor up close? I suspect it might have been a notable experience. Perhaps your thoughts were similar to those expressed by grade school children who were with me on a recent banding trip involving osprey (Pandion haliaetus): “Wow! Look at those talons! I would not want to be a fish,” “I don’t want to get too close; it might bite me,” and “The feathers are so colorful, and it has long powerful wings!” Children truly look at new things with wide-eyed wonder.

People exhibit a variety of emotional responses in the presence of raptors, and these reactions can be intense for those living in the suburbs and cities, especially when the encounters are unexpected. For example, several raptor species—such as osprey, bald eagles (Haliaeetus leucocephalus), and barred owls (Strix varia)—are often perceived as species that live only in remote wilderness settings. However, in recent decades, these birds have shown a high degree of adaptability and have become increasingly abundant in many urban and suburban landscapes. Do YOU RECALL THE FIRST time you saw a raptor up close? I suspect it might have been a notable experience. Perhaps your thoughts were similar to those expressed by grade school children who were with me on a recent banding trip involving osprey (Pandion haliaetus): “Wow! Look at those talons! I would not want to be a fish,” “I don’t want to get too close; it might bite me,” and “The feathers are so colorful, and it has long powerful wings!” Children truly look at new things with wide-eyed wonder.

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based on an individual's personal experiences, cultural heritage, education, and other factors. For example, owls have important significance among different human cultures and are symbolic of a wide variety of things, including (but not limited to) intelligence, education, wisdom, misfortune, dark omens, sickness, and death. Commonly, emotional responses to the presence of a raptor in a neighborhood or backyard might include curiosity, awe, pleasure, excitement, concern, outright fear, or indifference.

The intensity of emotional responses to urban raptors can be greatly increased during human-raptor conflict situations, especially in urban areas where residents might not often interact with birds of prey. Additionally, the emotional responses and associated perspectives can vary considerably for the same person depending on the specifics of the human-raptor conflict itself. For example, because I am a raptor researcher and wildlife biologist, I tend to be objective and normally focus on the management of raptor populations (figure 15.1). Managing populations, as opposed to individual animals, is a foundational tenet of the wildlife profession. However, when faced with a human-raptor conflict that affects me personally, such as a locally nesting hawk attacking my pets, a family member, or a backyard chicken flock, I am quite sure my reactions would be subjective and focused on managing (or likely, removing) the offending individual raptor(s). Understanding and appreciating the fact that anyone might shift along the objective-subjective spectrum (figure 15.1), due to a variety of reasons, is important.

**Benefits**

Urban raptors can provide important benefits and environmental services for humans. Raptors are popular with bird watchers and much of the general public. Also, urban raptors can provide opportunities for environmental education of people living in the suburbs and cities who might have limited contact with nature.
Ecosystem Services

Ecosystem services are benefits people receive from ecosystems and the species that compose those systems. Raptors in urban environments can provide a number of ecosystem services to the human inhabitants of suburban and urban environments. Examples of ecosystem services that raptors provide might include scavenging by vultures and other raptors, biological control of pest species (e.g., rats [*Rattus* spp.], rock pigeons [*Columba livia*], house sparrows [*Passer domesticus*]), and economic and social benefits from bird-watching and ecotourism associated with urban wildlife.

Environmental Education

Recent research in childhood education demonstrates how important experiences with nature are in shaping early environmental consciousness and ultimately the expression of positive environmental attitudes and behaviors during adulthood. Some species of urban raptors, due to their prominent nest sites and ability to live in close proximity to humans, provide opportunities for observation and learning (figure 15.2). Furthermore, a raptor’s ecological role within an ecosystem provides excellent examples for teaching about basic ecological principles, such as interactions among trophic levels, effects of environmental contaminants, animal migration, and conflict resolution, as we shall see in chapter 16.

As one example, the life history of ospreys can serve as a medium by which children and adults can learn about coastal and estuarine ecosystems, wildlife conservation, and bird migration. Currently, most osprey education programs are locally or regionally focused (i.e., they engage students within one school or community), and many involve primarily elementary school-aged children. During the last decade, improvements to technologies used in raptor research and conservation, especially satellite telemetry and webcams, have provided new scientific insights regarding raptors that migrate long distances. These advances in technology, social media, and web-based data sharing present new opportunities for large-scale citizen science endeavors and projects. Integrating raptor research conducted in the suburbs and cities into environmental education (at the primary, secondary, and postsecondary levels) and public outreach can provide mutual benefits to all involved.
Challenges with Urban Raptors

Urban raptors can negatively affect a variety of human interests, including human health and safety, livestock and companion animals, and important natural resources. Conflicts between raptors and people generally are localized and often site specific. However, the economic and social effects on the individuals involved can be severe.

Human Health and Safety

Raptors can be aggressive toward humans and inflict serious cuts and lacerations with their talons. In particular, during the nesting season, several species of raptors will defend their nests and young with great ferocity, as will be shown in several case studies detailed in chapter 17. These negative interactions occur most frequently when raptors are nesting in urban and suburban areas. Raptor attacks on humans result in highly charged emotional situations for those that are affected, especially when the incidents involve children. Although such situations
usually do not involve the general public and thus might not be a major concern to many people, those individuals directly experiencing a human-raptor conflict can be deeply affected. Wildlife managers and others involved in the resolution of these human-wildlife conflicts must be conscientious of this perspective.

In contrast to the occasional situation in which a pair of raptors is aggressive near their nest, birds of prey inhabiting airports located in urban and suburban areas present potential human-raptor conflict on a much larger scale. This is because of the number of individual birds and multiple species that can be involved, the size of the area affected, and the potential number of humans that could be affected. Raptors pose a risk to safe aircraft operations due to collisions between birds and aircraft (also known as bird strikes). Airports and military airfields represent a unique land use, particularly in suburban or highly urbanized environments. Many species of raptors commonly use the large, open grassland-like habitats for foraging. The relatively large body mass of raptors (relative to other bird species) increases the risk of damage to aircraft as well as the potential for human injuries and fatalities (figure 15.3). Bird strikes involving

Figure 15.3. Collisions between large raptors, such as this adult bald eagle, and aircraft can result in serious damage to aircraft and human injuries. Photo by Chris Cooper.
urban-dwelling raptors have resulted in significant and costly damage to aircraft as well as human injuries and fatalities.\textsuperscript{20,21,22}

**Nest Locations / Human-Made Structures**

The network of communication towers (e.g., lattice and monopole cellular telephone towers and lattice-guyed digital television antennas) is growing exponentially across North American landscapes, notably in the suburbs and cities.\textsuperscript{23,24} Communication towers, especially cellular towers, seem to have characteristics that make these structures attractive nesting sites for ospreys, eagles, and other raptors (figure 15.4). Conflicts arise when nest materials interfere with the function of the transmitting and receiving equipment on the towers (thus resulting in interruptions of service) or when repairs and maintenance must be completed. Increases in tower abundance and distribution due to increasing demands for utilities and services by a growing human population, combined with the physical characteristics of towers that are attractive to nesting raptors, appear to be creating the potential for current and future human-raptor conflicts.

**Livestock and Companion Animals**

The practice of urban agriculture has been growing in popularity during recent decades.\textsuperscript{25,26} In contrast to traditional livestock, urban livestock are commonly perceived as pets or companions, and their owners are often emotionally attached to them.\textsuperscript{26} In urban agriculture situations, most livestock depredation problems involving raptors occur with backyard poultry. Domestic poultry (e.g., chickens \textit{[Gallus gallus domesticus]}, turkeys \textit{[Meleagris gallopavo]}, ducks \textit{[Anas platyrhynchos domesticus]}, and geese \textit{[Anser anser domesticus]}) are particularly vulnerable to raptor predation because they are conspicuous, unwary, and usually concentrated in areas that lack escape cover.

Raptors are highly opportunistic predators. Small dogs, cats, and kittens left outside and unattended might be at risk from attack and predation from urban raptors. The frequency and severity of such incidents may increase during winter when food is scare or during early summer when newly fledged young are developing their hunting skills.
Effects on Other Wildlife Species

Hawks and owls can negatively affect other species of wildlife by predation and additive mortality. Great horned owls (*Bubo virginianus*), and occasionally red-tailed hawks (*Buteo jamaicensis*), can severely impact colonial waterbird and shorebird nesting colonies by concentrating their hunting efforts on specific colony sites and attacking both young and adults. This can be especially problematic if the nesting birds are rare or have Threatened and Endangered species status. For example, endangered California least terns (*Sternula antillarum browni*) are predated upon by several species of raptors within their nesting colonies located at beaches near Oceanside, California. Great horned owls are formidable predators that can kill and eat other raptors, such as peregrine falcons (*Falco*...
Humans and raptors (e.g., *peregrinus*) and osprey. Such predation events can be costly to reintroduction programs with the goal of increasing raptor numbers in urban and suburban areas.

**Economic Impacts**

The economic impact of human-raptor conflicts in urban areas can be substantial. These might include costs related to direct property damage or loss, lost revenue related to the inability to develop property, liability associated with failure to reduce or prevent human health and safety incidents associated with raptors, and other financial consequences. Although the monetary value of the loss of a few backyard chickens might seem insignificant, this could present an important financial hardship to the individual homeowner.

The presence of a bald eagle nest on private or commercial property could limit the potential economic value of the property due to federal and state regulations designed to protect this species (e.g., Bald and Golden Eagle Protection Act of 1940). Raptor-aircraft collisions have resulted in substantial financial losses associated with damaged and destroyed aircraft. Personal and corporate liability of individuals or corporations that are not working to resolve human-raptor conflicts represents a very contemporary and important issue.

**Human-Raptor Conflict Management**

As with any human-wildlife conflict situation, public information and education regarding wildlife damage management, the ecology of the species involved, and consideration and appreciation of human perceptions and social values are essential components of an effective solution. In particular, understanding the biology of the species involved is paramount to ensure that management efforts are successful. This knowledge will facilitate problem resolution, as each human-raptor conflict situation has the potential to be unusual, whereas other conflicts might occur across a wide variety of scales.

**Legal Status**

All raptors in the United States are federally protected under the Migratory Bird Treaty Act of 1918 (16 USC, 703−711). Raptors are typically protected under state wildlife laws or local ordinances as well. These laws strictly prohibit the capture, killing, or possession of hawks or owls (or their parts) without a special
permit (e.g., federal depredation permit) issued by the US Fish and Wildlife Service. State-issued wildlife damage or depredation permits also may be required to allow actions to alleviate human-raptor conflicts. Permits are not required to frighten or harass depredating migratory birds unless the birds have Threatened or Endangered species status.

**Passive Management**

As will be described in chapter 17, passive management efforts typically involve activities that minimize the contact between the offending raptor(s) and the affected people. For example, when an urban raptor becomes aggressive, the behavior is typically associated with nest defense for a specific period during the breeding season. Purposeful efforts to keep people and pets away from raptor nests during this time period can reduce the chance of aggressive hawk attacks and resulting injuries. Placing signs and notices near territorial nesting raptors can be an especially useful means of providing information to others that could help reduce the frequency and severity of negative interactions.

**Managing Prey Resources**

Backyard poultry depredations and raptor attacks on small companion animals (e.g., pets) represent human-raptor conflicts that occur on a very local scale. Resolution of conflicts on this level often requires modifications to the animal husbandry practices, such as providing appropriate enclosures for the poultry, or supervising pets while they are outdoors.

Airport grasslands often provide habitat for small mammals (e.g., rodents) that could attract raptors to airport environments. Assessing food habits of raptors (e.g., red-tailed hawks) that use airports allows management efforts to be directed toward the specific prey species of concern. Reductions in small mammal populations on airfields (with the intention of reducing forage availability to wildlife) can be accomplished by implementing an integrated pest management program, which might include the use of effective, targeted pesticide applications, habitat management actions, or other tools. Toxic baiting applications (e.g., rodenticides such as zinc phosphide) that target small mammals and reduce prey population abundance might be effective in reducing raptor use of airfield environments. Also, vegetation management activities (i.e., mowing) have resulted in reduced small mammal presence within grassland habitats.
Habitat Management

Habitat management approaches applied on a local scale might include the removal of a tree limb to prevent an aggressive raptor pair from using the same site during the next breeding season. Commercially available antiperching devices (e.g., Nixalite, Cat Claws, and inverted spikes) might help reduce use of buildings, roofs, and other structures that problematic raptors use as perching and hunting sites. Overhead wires made of nylon cord or heavy monofilament fishing line suspended in parallel over poultry pens and pet runs can also be effective in deterring urban raptors from swooping down on their intended prey.

In situations where urban raptors (e.g., ospreys) are nesting on human-made structures and thus may create conflicts, the addition of an artificial nesting platform (either to the structure itself or preferably on a pole erected nearby the nest site) offers a mutually beneficial solution. Discouraging the birds from using problematic nest sites through modifications to the structures, concurrent with the installation of the artificial platform, is an essential part of the process. Such actions can reduce fires, electrocutions, and collisions with power transmission towers and transmission lines. Decreased perching and nesting near such human structures in urban areas can reduce raptor mortality and decrease the occurrence of human-raptor conflicts.

Active Management

There are many tools and techniques that can be used to disperse raptors from an area where they are causing damage to property or conflicts with people. Simple, inexpensive tools and methods (e.g., air horns, banging pots and pans, and other methods of making loud noises at the offending bird) can be effective, especially in the suburbs and cities areas where deployment of pyrotechnics and firearms is not advisable or even legal. The effectiveness of frightening devices depends greatly on the bird, area, season, and method of application. Frightening devices usually reduce rather than totally eliminate human-raptor conflicts, but this might be sufficient for the involved individuals to consider the effort a “success.”

Human safety issues related to raptor-aircraft collisions are contemporary and serious. Addressing raptor strike events requires enhanced aviator awareness, proper reporting, and an emphasis on resolving the issue. Reduction of risk posed by raptors (and other wildlife) to aviation safety is best effected through the use of an integrated wildlife damage management program. These programs often include the use of nonlethal hazing and harassment, installation of
antiperching devices on airport structures, audible noise deterrents, pyrotechnics, translocation or culling of problematic individuals, and a variety of other tools and techniques.40,41,42

Livetrapping and translocating problem raptors is a commonly used, non-lethal method of resolving conflict situations between humans and raptors (figure 15.5). If possible, experienced birdbanders or wildlife professionals with proper training should manage raptor livetrapping efforts to ensure the safety of both raptors and people. As with other activities associated with raptors (such as rehabilitation42), state and federal permits are required to conduct livetrapping and translocation activities.

Translocating raptors is often perceived as a “panacea” for resolving conflicts. The homing behavior of raptors can be strong, and the offending bird(s) might return and continue the conflict. Furthermore, the efficacy of raptor translocation is relatively unstudied.43,44 Additional well-designed and peer-reviewed research is needed to allow for the development of effective, science-based recommendations to resolve these problems.

Figure 15.5. A young red-tailed hawk caught near a runway at an airport in a highly urbanized landscape. Live-capture and translocation of urban raptors away from conflict situations is a nonlethal method of conflict resolution.
Under the most extreme of circumstances, the lethal removal of problem urban raptors might be the most appropriate solution to human-raptor conflicts. Although this might be the initial desire of individuals experiencing high-stress conflict situations (e.g., raptor attacks on children that cause injuries), the application of this method is complex and requires state and federal permits. Lethal removal is usually considered only when all other conflict-reduction methods have been exhausted.

Summary

Interactions between raptors and humans in urban environments can be beneficial or detrimental, depending on a number of factors. Urban raptors provide environmental and social benefits to city-dwelling humans. However, urban raptors can also be involved in a wide variety of human-raptor conflict situations, some of which involve human health and safety. A multitude of factors and considerations can influence the decision on how to manage human-raptor conflicts. One of the most important questions to ask is “What is success?” Answering this question should involve those directly affected by the conflict situation. Overall, integrated management approaches are the most effective for long-term solutions. Management actions must be science based but also should be sensitive to human needs and desires.

Literature Cited


30. See chapter 17.


42. See chapter 16.
