Summer 2010

Wingover Newsletter

Dearest of Friends,

In February of 2011 the Illinois Raptor Center will celebrate its 20th year of service to the wildlife and people of Illinois.

Back in the late 1980's and early 90's there were quite a few humane organizations in Decatur that cared for dogs and cats. I was a member of a couple of them. But there was no organization with the proper state and federal permits, expertise or facilities to care for wild animals.

I realized then that there was a huge difference between the compassion that people felt toward pets and the compassion they felt toward wildlife.

People are very different from animals in that we have purpose in life that goes beyond daily survival. I guess it was during that time that I realized my purpose - to help balance the scales for wildlife.

It has been an honor to have helped lead the way for a wildlife center in Decatur. There have been wonderful, beautiful, once in a lifetime experiences over these 20 years that I will always remember. And there have been horrific situations that animals have been caught up in that I will never be able to forget.

There are many people - too many to name – that have touched this organization in so many ways.

✂

PLEASE JOIN THE ILLINOIS RAPTOR CENTER TEAM!

5695 W. Hill Road, Decatur, Illinois 62522 Phone 217-963-6909

E-mail to *illinoisraptorcenter@comcast.net*

Visit us at *www.illinoisraptorcenter.org* to volunteer or donate through **PayPal**.

Jane Seitz, Executive Director

Jacques Nuzzo, Program Director

The IRC is a 501(c) (3) private nonprofit organization

PLEASE NOTE! Every dollar helps!

If you think a small role doesn't make a difference, you have obviously never been in bed with a mosquito!

Each one of these generous people has played a permanent and timeless role in building the foundation of the Illinois Raptor Center. And there will be a place for them in my heart forever.

The pictures at the top of this newsletter are just a few of the animals that have been admitted to the IRC in the past several months. Each one has its own story and each story has a happy outcome or sad ending. Whatever the case, we made a difference in the life of an animal even if it were only to alleviate its pain and suffering. We made a difference at that one brief period in time - in that one specific animal's life.

The IRC is the working hands of people who do not have the time to do this work but feel that it is one of their life's purposes. Donors supply the means and the IRC supplies the way. We are all in this together. We are a hardworking team.

In the next two pages, you will get a look at IRC's admission records for raptors from 1995 through 2006 and what these records tell us. I hope you find it interesting and educational. You made it possible.

The data was compiled by Mallory Neese when she was a biology student at Millikin University and an intern for the IRC. Mallory is now a veterinary student at the University of Illinois. Dr. David Horn, an ornithologist in the Department of Biology at Millikin University, is the corresponding author. Many long hours of work went into gathering the information and putting it into meaningful statistical data to be published.

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It is a thrill to see IRC's work documented on paper and being published. I am very proud and I hope you are, too.

It is wonderful to have Dr. Horn and the Millikin Biology Department to work with. They are part of the team. The Millikin interns for this school year will be coming here soon. It is awesome that the work of the IRC not only benefits individual animals and can be used for scientific study but it is also a great hands-on field experience for biology students. These students are our future.

Thanks to all of you who are part of the team. If the IRC can help to fill a purpose for your life we are very, very pleased to do so. For those of you who haven't become part of the team – please join us today. Please help to keep the scales in balance for wildlife.

Yours faithfully, Jane Seitz

Donation Form – Thank you for joining the team!!! Wildlife Rehabilitation, Education, & Conservation

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IN THIS ISSUE

Cause of Admittance in Raptors Treated at the Illinois Raptor Center, 1995–2006

Mallory R. Neese, Jane Seitz, Jacques Nuzzo, and David Joseph Horn

Introduction

Currently, human causes of avian morbidity and mortality are increasing—and superseding those caused by natural factors (Fix and Barrows 1990, Deem *et al*. 1998). From 500 million to over 1 billion birds are killed by human causes in the United States each year (Erickson *et al*. 2005). Mortalities come from collisions with vehicles, power lines, communication towers, wind turbines, and windows; electrocution; poisoning; and cat predation (Erickson *et al*. 2005). Urbanization and agricultural intensification alter habitat and produce new environmental challenges for groups of birds such as raptors (Boal and Mannan 1999).

How raptor species are influenced by human activity, and the raptors' subsequent species-specific behaviors, may influence cause of injury. For instance, raptors adapted to urban environments experience greater numbers of attacks by cats and dogs, whereas raptors using power lines as perches are more susceptible to electrocution (Harden 2002, Erickson *et al*. 2005). Raptors hunting in residential areas have a higher proportion of window collisions (Boal and Mannan 1999), and species hunting near roadsides are injured more frequently by vehicle collisions (Massemin and Zorn 1998).

Cause of admission also changes over the course of the year. Wendell *et al*. (2002) examined raptor admissions at the Colorado State University Veterinary Teaching Hospital and found that trauma was the most common cause of morbidity and mortality overall; however, the most frequent reason for admission changed throughout the year. Between March and August, orphaned raptors represented the largest number of admissions. Between September and November, most raptors were admitted with unknown or unspecified injuries, while between December and February, toxicosis was most common.

We studied raptor rehabilitations recorded at the Illinois Raptor Center (IRC) in Decatur, Illinois, USA between 1995 and 2006, to assess causes of admission in central Illinois raptors, and to determine how causes of admission change over the course of the year. By learning more about the frequency of admissions and how raptor behavior influences susceptibility, we can develop solutions to reduce the amount of morbidity and mortality.

Methods

The IRC is a wildlife rehabilitation and educational facility in Decatur, Illinois, USA. The IRC admits raptors on a case-by-case basis, by appointment, and occasionally admits birds from other rehabilitation centers and from the University of Illinois Wildlife Medical Clinic. Information on each raptor is collected including date, species, injury or reason for admission, and the city and county where the raptor was found. The data are compiled annually into a wildlife report and submitted to the Illinois Department of Natural Resources and US Fish and Wildlife Service. The wildlife report data collected by the IRC from 1995–2006 were examined in this study.

Reasons for admission were divided into 35 categories, based on the raw data taken from the IRC wildlife reports (Table 1). If a raptor had two listed causes of admission, the most severe cause was used. Chi-square (χ^2) tests were performed for specific admissions that occurred ≥20 times between 1995–2006, both to examine if the frequency of a particular admission was equivalent among species and if specific admissions occur evenly

IN YOUR PRACTICE: Rehabilitators regularly collect patient histories at intake, but these data are rarely used in research applications. This paper provides one example of the value of examining rehabilitation data over a 12-year period: to identify trends that may provide insight for future conservation and impact-mitigation efforts.

ABSTRACT: Raptors are threatened by both anthropogenic and natural factors. We examined the cause of admittance and their temporal occurrence in raptors admitted to the Illinois Raptor Center in Decatur, Illinois, United States from 1995–2006. Six species were analyzed: Cooper's hawk *(Accipiter cooperii)*, red-tailed hawk *(Buteo jamaicensis)*, American kestrel *(Falco sparverius)*, eastern screech-owl *(Otus asio)*, great horned owl *(Bubo virginianus)*, and barred owl *(Strix varia)*. Each raptor species was prone to a different suite of admission causes. Sixty-five percent of raptors involved in window collisions were Cooper's hawks, and 61% of raptors involved in vehicle collisions were great horned owls and barred owls. By recognizing patterns of raptor admissions, we can develop solutions to reduce the morbidity and mortality associated with these admissions.

KEY WORDS: Admission, behavior, collision, hawk, Illinois Raptor Center, injury, kestrel, orphan, owl, raptor, rescue, trapped

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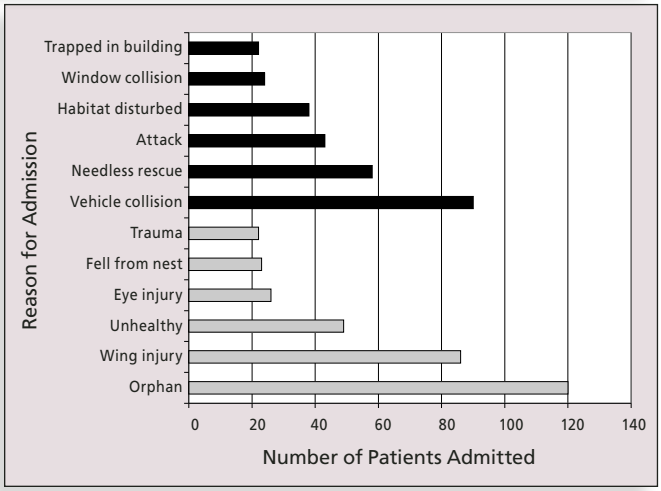
TABLE 1. Categories of admittance of raptors treated at the Illinois Raptor Center in Decatur, Illinois, United States from 1995–2006.

INJURY TYPE AND EXAMPLES	NO. REPORTED
Attack by cat, crow, dog, human	43
Beak injury such as broken beak	3
Broken back	1
Bumble foot	1
Caught in items such as string, fishing line, hunting trap	7
Dead on arrival	8
Deformed	2
Electrocution	7
Eye injury including blind eye, blood in eyes	26
Falconry bird recovered	1
Fell from nest	23
Fledgling, juvenile that cannot care for itself	19
Found displaced such as on the road, out of nest	14
Fracture (unspecified location)	3
Gun shot	7
Habitat disturbed and knocked out of nest	38
Human interference including illegal pet, imprint, intentionally cut feathers, removed from danger	13
Imping necessary	3
Keel injury	1
Leg injury such as fractured leg	7
Mobbed	3
Needless rescue	58
Nuisance	4
Oil	2
Orphan	120
Poisoned	4
Trapped in a building	22
Trauma	22
Unable to fly	18
Unhealthy such as sickly, starving	49
Unknown admission including rehabilitation, unspecified injury, other	244
Vehicle collision such as car, train	90
West Nile Virus (suspected cases)	13
Window collision	24
Wing injury such as broken wing, bruised wing, wing amputee, wing torn off	86



throughout the year. Additional χ^2 tests were also performed to determine if the numbers of each species of raptor admitted to the IRC was equivalent each month. For analyses involving individual species, only species with ≥20 admissions to the IRC between 1995–2006 were used. When expected frequencies of χ^2 tests were equal, but below 5, significance levels below the standard 5% (i.e., $P < 0.05$) were necessary for results to be considered conservative (Zar 1984). Therefore, we considered results of all statistical tests to be significant if $P < 0.01$.

Results

From 1995–2006, the IRC treated 986 raptors of 21 species; these comprised most of the eagle, hawk, falcon, and owl species found in central Illinois. The number of raptors admitted ranged from 50 in 2003 to 140 in 1999, with a mean of 82. Six species were admitted ≥20 times to the IRC, Cooper's hawk ($n = 57$), red-tailed hawk ($n = 163$), American kestrel ($n = 268$), eastern screech-owl ($n = 165$), great horned owl ($n = 191$), and barred owl ($n = 85$), and accounted for 94% of the raptors admitted to the center.

The 986 raptors admitted to the IRC between 1995–2006 were admitted for a number of causes (Table 1). Twenty-five percent of raptors (244) fell into 'unknown admission' including rehabilitation, unspecified injury, or other. The remaining 75% of raptors (742) fell into 34 categories, ranging from 1 to 120 events, with a mean of 22. Of the twelve admission categories for which ≥20 events were reported, 55% (329) were suspected to be from natural or unidentifiable causes while the other 45% (272) were human caused (Fig. 1). We found that the proportion of needless rescues ($P = 0.0025$), orphans ($P = 0.0005$), trappings ($P = 0.001$), vehicle collisions ($P < 0.0001$), window collisions ($P < 0.0001$), and wing injuries ($P = 0.0002$) differed among species (Table 2).

The cumulative number of raptors admitted between 1995–2006 varies per month with January having 50 admissions, February = 43, March = 51, April = 102, May = 165, June = 201, July = 91, August = 72, September = 55, October = 49, November = 60, and December = 47. Cooper's hawk ($P = 0.41$) and red-tailed hawk ($P = 0.89$) had no difference in the month that admittance occurred, while American kestrels ($P < 0.0001$) peaked in June. Eastern screech-owl ($P < 0.0001$), great horned owl ($P < 0.0001$), and barred owl ($P = 0.0091$) all exhibited differences in monthly admittance. Eastern screech-owls peaked in May and great horned owls in April, while barred owls peaked during April and May.

Admittance of all species, combined, were more likely to occur during specific months of the year, e.g., as a result of habitat disturbances ($P = 0.0001$), needless rescues ($P < 0.0001$), orphans (P

FIGURE 1. The twelve, most-common causes of admittance of central Illinois, USA raptors treated at the Illinois Raptor Center between 1995–2006. These data omit those causes with fewer than 20 incidents. The first six admission categories listed from top to bottom are associated with human causes (45% of total), and the remaining six are natural causes or have an unidentified origin (55%).

TABLE 2. Reasons for admission were species-specific at the Illinois Raptor Center (IRC) in Decatur, Illinois, USA from 1995–2006.

CAUSE OF ADMITTANCE	AMERICAN KESTREL	COOPER'S HAWK	RED-TAILED HAWK	BARRED OWL	EASTERN SCREECH-OWL	GREAT HORNED OWL
Needless rescues	49%1 (102)	0% (0)	9% (3)	2% (1)	26% (9)	14% (4)
Orphans	39% (17)	2% (4)	7% (5)	3% (5)	26% (19)	22% (14)
Trapped in building	85% (6)	0% (0)	0% (0)	0% (0)	10% (1)	5% (1)
Vehicle collisions	12% (3)	1% (2)	12% (6)	36% (33)	14% (7)	25% (10)
Window collisions	22% (2)	65% (26)	0% (0)	0% (0)	13% (2)	0% (0)
Wing injuries	19% (5)	17% (21)	30% (13)	9% (7)	10% (4)	15% (5)

[1] Percentage of admissions by given raptor species (e.g., 49% of all needless rescues at the IRC involved American kestrel).

[2] Frequency of admittance into IRC for treatment by given raptor species (e.g., 10% of all American kestrel admissions were due to needless rescue).

< 0.0001), trappings ($P < 0.0002$), and wing injuries ($P = 0.0008$). For all species combined, habitat disturbances peaked in May and needless rescues and orphanings occurred more frequently April to July, whereas wing injuries peaked in March and May. No peak month for trappings was observed.

Discussion

Raptors admitted to the IRC were treated as a result of both natural and anthropogenic causes. Wildlife Rescue, Inc. of New Mexico, between 1994 and 1998, categorized 22% of injuries as natural, and 78% of injuries as anthropogenic, out of 2,157 admissions (Harden 2002). Deem *et al.* (1998) found 87% of 279 trauma cases in raptors were directly associated with human involvement. In admissions we were able to categorize, we found a substantial impact of human activity on central Illinois raptors, with at least 45% of admissions identifiable as human-caused.

Each species' tolerance to human activity, and that specie's subsequent reactive behavior, influences the type of injuries they sustain. The feeding ecology of Cooper's hawks may be contributing to window collisions as the most common admission of Cooper's hawks, accounting for 26% of all admissions in this species observed at the IRC. Boal and Mannan (1999) found that window collisions caused the greatest rate of mortality in Cooper's hawks in Tucson, Arizona (70%). They attribute this to backyard bird feeders drawing Cooper's hawks toward prey and windows.

Red-tailed hawks accounted for 30% of all wing injuries to the IRC, and wing injuries were the third, most-common reason for their admission. Further investigation into the cause of these wing injuries needs to be made, but we suspect they are due to collisions with human structures. For example, red-tailed hawks are more likely to kite in high wind conditions, making them more susceptible to collisions with wind turbines (Hoover and Morrison 2005).

American kestrels and eastern screech-owls are more susceptible to being brought in as orphans and to suffer needless rescues. Wendell *et al.* (2002) studied morbidity and mortality in raptors and found that 34% of both species of screech-owls, *Otus asio* and *Otus kennicotti*, came in as orphans to the Colorado State University Veterinary Teaching Hospital between 1995 and 1998. Due to their small size, kestrels and screech-owls may also be more susceptible to needless rescues, as they are mistakenly identified as being in danger, displaced, or orphaned (J. Seitz and J. Nuzzo, pers. obs.). In addition, American kestrels are more likely to get trapped in buildings. Buildings where kestrels get trapped typically have large garage doors or loading areas and contain large numbers of house sparrows (*Passer domesticus*) (J. Seitz, pers. obs.).

Great horned owls and barred owls are susceptible to collisions with vehicles, and 61% of all collisions with vehicles involve great horned owls and barred owls. Massemin and Zorn (1998) found that of 187 road-killed raptors in northeastern France, 173 were owls. Loos and Kerlinger (1993) found that 94% of avian–vehicle collisions in New Jersey, United States, were owls. The greater numbers of vehicle collisions among owls may be due to their hunting methods and to embanked highways, where owls usually fly 2–5 m above the ground, making them targets for vehicles (Massemin and Zorn 1998, Harden 2002).

Admittance to raptor centers corresponds with the life-history stages of raptor species. The IRC admits the majority of raptors during April, May, and June, where the most common identifiable cause of admission, orphans, frequently occurs. American kestrels peak at the IRC in June. According to Smallwood and Bird (2002), in Iowa, United States, kestrel pairs begin clutch initiation in April, incubation lasts for 27–29 days, and fledging occurs 28–31 days after hatching, meaning that a large majority of orphans would be found near May and juveniles would be dispersing near June. Great horned owl admissions peak at the IRC in April. For this species, clutching begins between January and February, with incubation an average of 33 days, and young fledge 6 wk later (Houston *et al.* 1998). Therefore, March and April would be the expected months where admissions of orphans are high, and April would be the month when fledglings are moving about, resulting in an increased incidence of admittance.

By understanding how species-specific behavior influences admissions, and when specific admissions are most likely to occur, we can develop solutions to reduce these factors of morbidity

and mortality. For example, Klem *et al.* (2004) found that moving bird feeders to within 1 m (~3 ft.) of a window reduced the number of fatal window collisions by songbirds. Future studies need to be conducted to determine if this preventative measure for songbirds would also reduce the number of injuries Cooper's hawks sustain at windows. Great horned owl and barred owl are more susceptible to vehicle collisions. Owl species may be drawn to roadsides by increased prey abundance in prairie grasses (Massemin and Zorn 1998). As more and more states adopt programs to restore roadsides with native prairie, owls may be increasingly susceptible to collisions. Thus, studies that examine how to reduce owl–vehicle collisions should be conducted and recommendations implemented when feasible. Furthermore, educational programs at rehabilitation centers could be timed to correspond with when particular injuries are more likely to occur (e.g., programs on unnecessary rescue of wildlife would be most effective in spring and summer).

Rehabilitation centers are valuable for advancing medical treatment, learning more about emerging diseases, understanding the human impact on wildlife populations, and as educational outlets to raise awareness of raptors (Fix and Barrows 1990, Sleeman and Clark 2003). Data from separate rehabilitation centers could also be combined. This would allow a better understanding of the causes of morbidity and mortality among raptor species and would promote the development of more-effective management strategies for reducing these causes.

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Literature Cited

Boal, C. W., and W. R. Mannan. 1999. Comparative breeding ecology of Cooper's hawks in urban and exurban areas of southeastern Arizona. *Journal Wildlife Management* 63(1): 77–84.

Deem, S. L., S. P. Terrell, and D. J. Forrester. 1998. A retrospective study of morbidity and mortality of raptors in Florida: 1988–1994. *Journal Zoo and Wildlife Medicine* 29(2): 160–164.

Erickson, W. P., G. D. Johnson, and D. P. Young. 2005. A summary and comparison of bird mortality from anthropogenic causes with an emphasis on collisions. General Technical Report PSW-GTR-191, USDA Forest Service, USA.

Fix, A. S., and S. Z. Barrows. 1990. Raptors rehabilitated in Iowa during 1986 and 1987: A retrospective study. *Journal Wildlife Diseases* 26(1): 18–21.

Harden, J. 2002. An overview of anthropogenic causes of avian mortality. *Journal Wildlife Rehabilitation* 25(1): 4–11.

Houston, C. S., D. G. Smith, and C. Rohner. 1998. Great horned owl (*Bubo virginianus*). The Birds of North America, Number 372.

Hoover, S. L., and M. L. Morrison. 2005. Behavior of red-tailed hawk in a wind turbine development. *Journal Wildlife Management* 69(1): 150–159.

Klem, Jr., D., D. C. Keck, K. L. Marty, A. J. Miller Ball, E. E. Niciu, and C. T. Platt. 2004. Effects of window angling, feeder placement, and scavengers on avian mortality at plate glass. *Wilson Bulletin* 116(1): 69–73.

Loos, G., and P. Kerlinger. 1993. Road mortality of saw-whet and screech-owls on the Cape May Peninsula. *Journal Raptor Reearch.* 27(4): 210–213.

Massemin, S., and T. Zorn. 1998. Highway mortality of barn owls in northeastern France. *Journal Raptor Research* 32(3): 229–232.

Sleeman, J. M., and E. E. Clark, Jr. 2003. Clinical wildlife medicine: A new paradigm for a new century. *Journal Avian Medicine and Surgery* 17(1): 33–37.

Smallwood, J. A., and D. M. Bird. 2002. American kestrel (*Falco sparverius*). The Birds of North America, Number 602.

Wendell, M. D., J. M. Sleeman, and G. Kratz. 2002. Retrospective study of morbidity and mortality of raptors admitted to the Colorado State University Veterinary Teaching Hospital during 1995 to 1998. *Journal Wildlife Diseases* 38(1): 101–106.

Zar, J. H. 1984. Biostatistical analysis, 2nd Edition. Prentice-Hall, Englewood Cliffs, New Jersey, USA.

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