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Evaluation of controlling Red-tailed Hawks (Buteo jamaicensis) through live trapping and relocation to minimize aircraft strikes at Canadian Airports

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Abstract

Central and Southwestern Ontario is one of the largest migratory flyways for raptors in North America. The expanse of airfields and prey availability make airfields attractive to migrating raptors, which may result in an increase in over wintering birds. These birds do not readily scare with conventional wildlife control methods and have high public profile. Even though the strike risk is moderate, raptors routinely make the top ten list for strikes from all bird species (8%) at Canadian Airports. The potential for damage from a collision with raptor species is high due to their size and weight. It has been suggested that the live trapping and relocation of raptors has limited application and success.

The banding of trapped and relocated raptors from Lester B. Pearson International Airport (Toronto, ON) and Windsor Airport (Windsor, ON) suggests that this approach to control is very effective. Of the 1502 Red-tailed Hawks (*Buteo jamaicensis*) relocated from Pearson International Airport over the past 15 years, 4 % returned to the airfield and that less than 2% returned within the same migratory period (90 days from initial encounter). The data collected also indicates that the concept of resident birds being replaced by naïve birds is not accurate because the majority of birds caught at Pearson are trapped during migration and therefore are by definition not resident birds.

Key words: raptors, aircraft strike, Red-tailed Hawk (*Buteo jamaicensis*), banding.

Introduction

The removal of raptors from Lester B. Pearson International Airport to sites at least seventy kilometers from the airport has been carried out for the past fifteen years in order to reduce the potential of a bird / aircraft collision. The strategy for raptor control prior to live trapping was to shoot and kill raptors that ventured on to airport lands. A general increase in the appreciation and concern over the welfare of wildlife and raptors in particular has made this strategy unpopular with the public. As a part of the trapping and relocation program, birds are banded before release in order to ascertain their movements and life span. It has been suggested that this program is not successful because banded birds return soon after relocation and that resident birds, when removed are then replaced with naive birds, which may pose a greater risk to aircraft (Harris, R. and R. Davis, 1998)
The following paper examines the return rate and seasonal fluctuations of Red-tailed Hawks trapped and relocated from Pearson International Airport during the period from 1984 until 1998 in order to determine whether the program is successful. Red-tailed hawks were chosen for this study because they are the most common raptor trapped at Pearson and also due to their characteristic behaviour of soaring over open areas while hunting which increases the chance of being hit by aircraft. The data suggests that the trapping and relocation of Red-tailed Hawks from airports is a successful strategy to reduce the risk of bird strikes because only 4 % of all Red-tails trapped and relocated returned to the airport and of these less than 2 % returned within ninety days. Ninety days was chosen as a benchmark in order to adjust for the seasonal migration of Red-tailed Hawks. Success is defined as the reduction of the potential of a Red-tailed Hawk being hit by aircraft.

This paper also challenges the accepted notion that resident birds when removed are then replaced by naive birds. Instead the data indicates that the majority of Red-tailed Hawks trapped at Pearson International are trapped during migration periods and are not resident birds and are therefore naïve

birds. The results obtained from this study supports the continuation of trapping and relocation of raptors to meet airport safety needs and as a conservation strategy to obtain more information on the movements of Red-tailed Hawks.

Red-tailed Hawks are attracted to the open grassy areas of airports due to the abundance of prey and availability of structures such as fencing and communication towers, which serve as perches. As one of Eastern North America's largest raptors, its relative abundance and behaviour make it a genuine concern for those operating aircraft. In the past raptors had declined in numbers due the use of such pesticides as DDT and habitat loss. The Red-tailed Hawk has gradually been increasing in numbers over the past decade becoming a familiar site in urban areas especially during the winter months where they can be seen perched in trees along busy highways. Pearson is located between a number of these highways including the 401 and 427 where these birds can be found in significant numbers.

The number of hawks within the airport boundaries varies depending upon the time of year. There are basically three seasonal movements of these birds. Spring migration from mid-March until mid-May, fall migration from mid- September until late December and the dispersal of immature hawks immediately after the breeding season during July and August (Stokes, 1989). Immature hawks become independent from their parents from mid-summer until late summer moving away from breeding areas in all directions. However, by mid-fall immature birds begin moving south along with adult birds. Adult birds generally establish breeding territories from February until June depending on latitude, with birds in more northerly locations starting later. Breeding areas range from half a square mile to two square miles depending on abundance of prey and are generally in wooded rural areas. Occasionally some birds may nest in suburban areas, where there is little pedestrian traffic. Winter territories may be established, however at this time there are only visual observations to support this belief.

Raptors make up 8.1 percent of known air strikes, with hawks making up 4.1 percent or half of all raptor strikes (Aerodrome Safety Branch, 1999). The average size of a Red-tail is 55 cm long with an average wing cord of 35cm (an approximate wing span of 80 cm and an average weight of 1000 g (Godfrey, 1986, Wernaart, 1999). Their size and weight make them a significant hazard to aircraft.

Methodology

Raptors have been trapped and removed, but not banded from Pearson International Airport on a limited basis since 1978. A diligent effort by the authors to band and record data retrieved from all trapped raptors has resulted in a total of 1502 Red-tailed Hawks trapped and relocated during the period from 1984 to 1998. Trapping effort has not always been constant over the years and has depended on a number of factors including the number and location of the traps and the initiative of those monitoring the traps. Initially Mr. U. Watermann trapped raptors at Pearson. The staff of Intercept Wildlife Control, which presently holds the wildlife control contract for Pearson are now doing the trapping.

Presently the wildlife contractor is responsible for the trapping and care of any raptors captured. Red-tailed hawks and other raptors are trapped using Swedish Goshawk traps, which are baited with pigeons. Initially five permanent stationary traps were set at strategic locations around the grassy areas along runways. The number was increased to twelve traps in 1989. Generally the traps are checked at least once daily and any birds trapped are moved to the mews where they are fed and watered. Pickup and removal of birds is on a weekly basis.

The birds are moved in specially made wooden carrying boxes to a site approximately 70 km west of the airport, near Milton. Occasionally some birds were released at alternate sites such as on the Lake Huron Shore or the Bruce Peninsula in order to direct them with the flow of migration. This was done to determine if the birds are less likely to return to the airport if they are moved further away. However, this alternate strategy has only been carried out with a limited number of birds (56) and it too early to assess the success of such changes. This study has included all birds relocated; including those released at alternative locations. It is believed that these birds do not influence the data, since this study concerned with return rates and the overall success of relocating birds and not the distance of relocation.

Data and Findings

There have been a total of 1502 encounters with Red-tailed Hawks from Pearson International Airport since 1984. An encounter is defined as any bird, which is trapped at the airport and relocated and includes birds that are retrapped and foreign retraps. The first time a non-banded bird is trapped it is banded and the weight, wing length and age are recorded. This information is then forwarded to the Bird Banding Laboratory in Washington, D.C.; foreign recovery data are also forwarded to this location.

1416 Red-tailed Hawks were banded from January 1984 until December 1998. Of these birds, fifty-nine (4 %) have been trapped a second time and eight (< 1 %) of these have been trapped a third time. No birds have been retrapped a fourth time. Eighteen of the birds that have been taken from the airport are foreign retraps, birds initially banded at other locations. Seventy-nine (6 %) of the 1416 birds banded have been recovered at other locations. The total number of recoveries of Red-tailed Hawks banded at Pearson International Airport is calculated by adding the number of recoveries from other location (79) to the number of recoveries from the airport (59). The total number of recoveries (138) is divided by the total number of Red-tails banded from the airport (1416) to give the percentage of Red-tailed Hawks (10 %) that are removed from the Airport and are recovered.

The average number of Red-tails trapped each year (94.4) has been relatively stable with the exception of 1998. In 1998 the number of birds increased dramatically to 296, a 315 % increase. The reason for this increase in captures is not known, however it may be due to the corresponding natural overall increase in hawk numbers, or perhaps there was an increase in trapping effort by the wildlife control staff. Either way the increase in numbers did not significantly effect the percentage of birds returning to the airport. There was a 4 % return rate within a season, which remains a low percentage of returning birds.

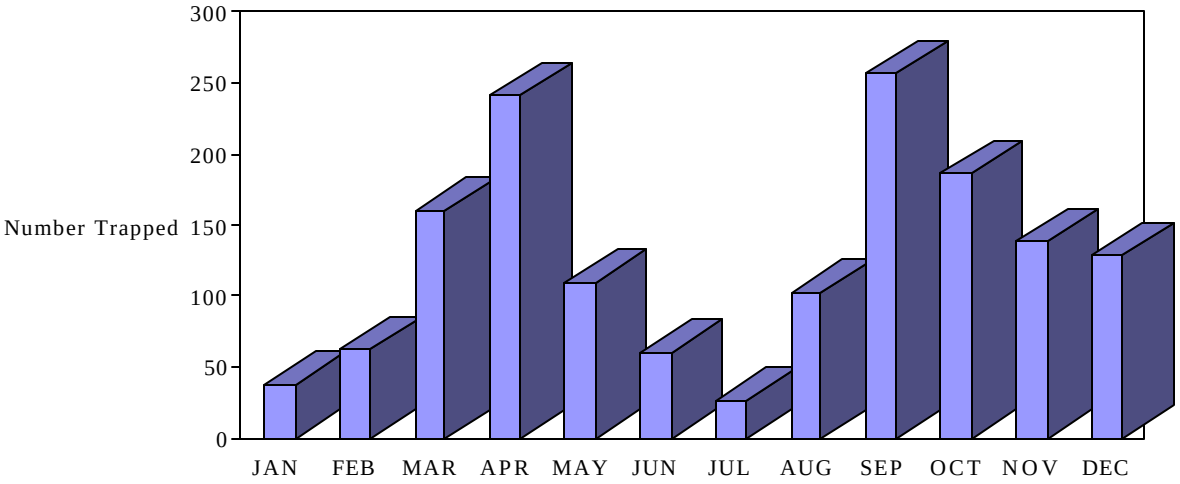
TABLE 1 - Recovery Data

Total Encounters	**1502**
Total Birds Banded	**1416**
Number Retrapped Once	**59**
Number Retrapped Twice	**9**
Total Number of Birds Retrapped	**68**
Foreign Retrapped Birds	**18**
Foreign Recovered Birds	**79**
Total Recoveries	**9+59+79=147**

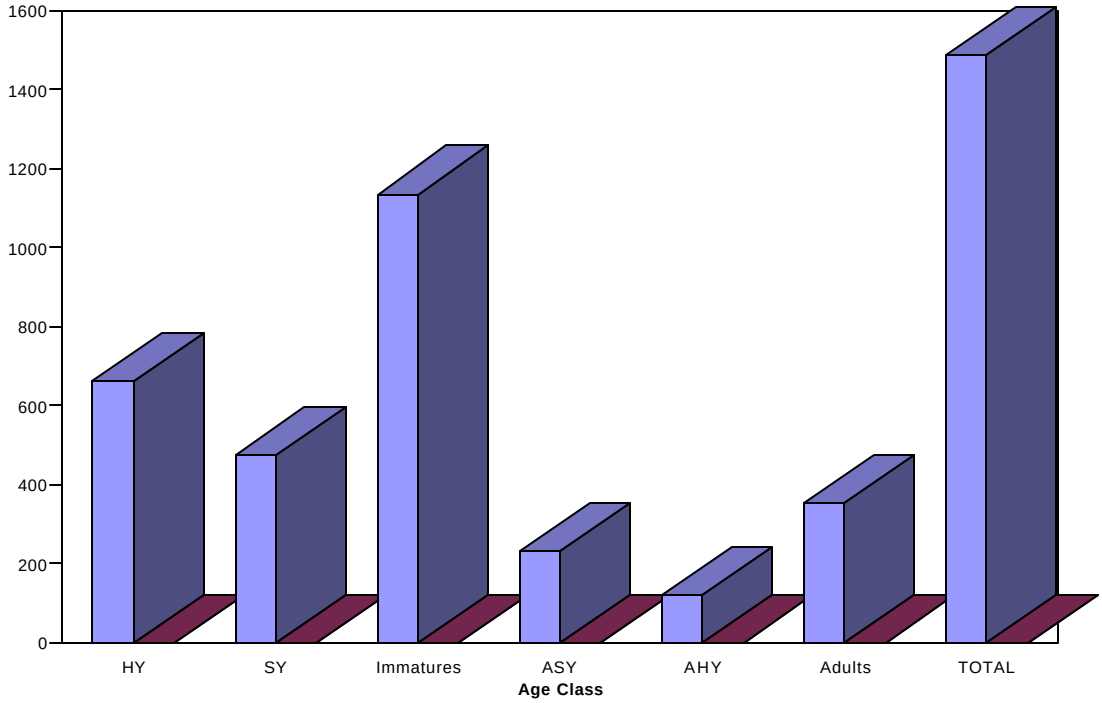
TABLE 2 – Age breakdown of Red-tailed Hawks Trapped At Pearson International Airport

AGE	#	% Total
HY	670	44%
SY	476	32%
Immature	1146	76%
ASY	233	16%
AHY	123	8%
Adults	356	24%
TOTAL	**1502**	**100%**

Numbers of Red-tailed Hawks Trapped by Month at Pearson International Airport 1984 -1998



Age of Red-tailed Hawks Trapped at Pearson International Airport



The number of days between initial capture and recapture was determined for each bird. Although somewhat arbitrary, ninety days was chosen as the period, which would indicate seasonal movements. Any birds that were trapped in less than ninety days could be said to have returned directly to the airport. Those that are trapped after greater time periods would be considered to have returned as a part of a migratory movement. This time period was based on the recognition that the end of one migratory period and the start of the next, is at least ninety days apart. The number of birds that were trapped within ninety days was 31 or 2 % of the total number of birds encountered. In order to substantiate our claim that the majority of birds trapped were on migration, the number of birds captured per month was calculated. The data showed that majority of birds are trapped during the months of March /April and September through November, which coincides with spring and fall migration (see Chart 1). The data also indicated that the majority (1146 or 76 %) of Red-tailed Hawks trapped is immature and therefore non-breeding and non-territorial birds. (see Chart 2)

Windsor Airport Comparison

The live trap, banding and removal of raptors from Windsor Airport (Essex County, Ontario) has not been part of the wildlife control program as long as it has been at Pearson International but has remarkably similar data with respect to return rates of relocated birds. Two (2.1%) percent return for birds recovered within the same season (within 90 days) and less than 4% ever returning. The significant difference in the data collected from Windsor stems from a protocol of keeping Red-tailed Hawks in captivity for 48 or more hours and relocating the bird at least 50 km from the airfield. Failure to follow this protocol in the Windsor situation will result in return rates greater than 27% within 30 days of the original encounter. This percentage may in fact be higher due to the difficulties in trapping recently handled birds.

Conclusions

The goal of this paper was to assess the success of removing and relocating Red-tailed Hawks from airports. The data indicates that there is a low rate of recapture at 4 % overall and less than 2 % during a seasonal period. This low rate of recapture remained consistent even when the number of birds trapped increased as they did in 1998. This indicates that removing Red-tailed Hawks as a strategy to eliminate potential strikes with aircraft is successful.

During breeding season and possibly during the winter, resident birds defend territories. Although the natural areas at Pearson afford a suitable hunting area for Red-tailed Hawks, the area is within a built up area in which few, if any birds nest. Some wildlife control professionals have argued that resident birds may drive off non-resident birds and that resident birds may also be more familiar with and thus better able to avoid aircraft. Removal of these birds may then create more problems because new and presumably naïve birds would move into the vacated area. However, data collected from banded birds indicates that the majority (1146 or 76 %) percent of Red-tailed hawks banded were immature birds that are not breeding. It is therefore unlikely that resident birds, if there are any, will serve as a natural deterrent especially since most birds are young birds passing through during migration and not during breeding season.

Little is known about winter residents and thus it is difficult to say with certainty what the effects of removing a resident bird might be. However, one may hypothesize that if the site is productive then a new resident would take over the site and this would result in a constant capture of birds during this period. The data suggests otherwise with very few birds being captured during this period. Removal of birds during migration may however, prevent these birds from staying in the area over winter.

The implications of this study are that the removal of Red-tail Hawks from airports is a successful program, and should be continued. The study has also generated a number of new questions that should be examined. The question of whether Red-tail Hawks maintain and defend winter territories and its relationship to wildlife control at airports could be studied. The question of what is the appropriate distance for relocating birds of prey also needs to be studied further. There have only been a few birds that have repeatedly returned to the airport over the fifteen years that this program has been operating.

However, a systematic study to determine the effect of distance of removal on recapture rates would add to our understanding of Red-tailed Hawk behaviour.

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