

# THE INCIDENCE OF MAN-CAUSED AND NATURAL MORTALITIES TO RAPTORS

by

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## Introduction

Over the past 15 years, I have observed more than a hundred cases of raptor mortality, most of which were man caused either directly or indirectly. These observations stimulated me to examine additional data from other sources concerning raptor mortality. This paper, the result of looking into raptor mortality factors, discusses the incidence of man-caused and natural mortalities. Data is also provided on frequency of band returns, maximum recorded longevity, and average survival for 24 raptor species.

## Methods

In 1976, I developed a questionnaire which I mailed to 40 people to gather data about mortality and instances that they were aware of. Replies were received concerning 153 cases of mortality from 16 persons. My records from 1969 to present contained 120 cases. I also contacted the Raptor Rehabilitation Center (RRC) at the University of Minnesota, and they provided 1,051 additional records. The Federal Bird Banding Laboratory (BBL) in Laurel, Maryland, provided 5,697 records of mortality for raptors banded in North America.

## Results and Discussion

I have treated the data in several ways. Table 1 indicates the species included in this study and the information available as the number of returns for raptors banded in North America between 1955 and 1979. The average band return for birds of prey as a group runs 1.7%. Returns from two Canadian banders are not included. Average survival was calculated by using birds banded as nestlings and recovered at a later date (Table 2). Four species have no survival information as nestling data was not available.

Overall, the Red-tailed Hawk (*Buteo jamaicensis*), Great Horned Owl (*Bubo virginianus*), and American Kestrel (*Falco sparverius*) provided for 43.2% of the mortality records. These three species are common and widely distributed in North America and utilize similar habitat types.

Tables 3, 4, and 5 present data for the three data groups (Keran and others, RRC, and BBL) regarding causes of mortality for each species. Table 4 lists all birds as mortalities when, in fact, some (approximately 30% overall) were successfully rehabilitated. I feel justified in calling the rehabilitated birds mortalities—because, had the RRC not been in existence, the birds would not have survived.

Table 6 indicates the percent of all reported records for raptor mortality and lists mortalities as to type (natural, man caused, and unknown).

Natural causes accounted for 9.6% (Keran and others), 7.9% (RRC), and 6.9% (BBL) of reported mortalities. Man-caused deaths accounted for 85.4% (Keran and others), 83.8% (RRC), and 25.7% (BBL) of the mortalities. Unknown causes were 4% (Keran and others), 8.3% (RRC), 67.4% (BBL) of the reported deaths. Records from the Bird Banding

Table 1. Birds of Prey Band Returns for 1955-1979

Species	No. banded 1955- August 1979	No. returns 1955- August 1979	% returns
Osprey	10,747	284	2.6
Goshawk	5,388	122	2.3
Cooper's Hawk	6,935	106	1.5
Sharp-shinned Hawk	78,616	473	0.6
Red-tailed Hawk	37,908	962	2.5
Red-shouldered Hawk	4,072	71	1.7
Swainson's Hawk	4,496	50	1.1
Broad-winged Hawk	2,746	34	1.2
Am. Rough-legged Hawk	1,524	41	2.7
Harrier	5,158	73	1.4
Golden Eagle	2,866	120	4.2
Bald Eagle	4,248	136	3.2
Merlin	3,873	31	0.8
Kestrel	54,296	910	1.7
Barn Owl	8,046	364	4.5
Great Horned Owl	12,999	493	3.8
Barred Owl	973	35	3.6
Long-eared Owl	3,641	22	0.6
Short-eared Owl	1,690	18	1.1
Screech Owl	9,213	218	2.4
Saw-whet Owl	12,003	72	0.6
Snowy Owl	1,115	50	4.5
Great Gray Owl	220	6	2.7
Boreal Owl	270	3	1.1

Table 2. Longevity and Survival for Birds of Prey from Bird Banding Laboratory Records

Species	No. of Records	Longevity		Average Survival (mo.)
		yr.	mo.	
Osprey	447	21	10	35.8
Goshawk	120	8	7	10.7
Cooper's Hawk	136	6	5	16.3
Sharp-shinned Hawk	484	13	0	—
Red-tailed Hawk	1,031	21	1	16.1
Red-shouldered Hawk	104	11	10	25.6
Swainson's Hawk	54	5	2	15.8
Broad-winged Hawk	37	3	2	12.0
Am. Rough-legged Hawk	48	18	1	20.7
Harrier	114	10	8	16.6
Golden Eagle	130	11	1	19.6
Bald Eagle	173	27	1	18.8
Merlin	35	3	5	14.3
Kestrel	1,017	9	10	12.6
Barn Owl	572	34	0	20.9
Great Horned Owl	525	17	5	29.3
Barred Owl	50	10	6	25.5
Long-eared Owl	36	13	7	3.4
Short-eared Owl	21	2	6	1.0
Screech Owl	410	27	10	10.6
Saw-whet Owl	89	3	8	—
Snowy Owl	55	5	9	—
Great Gray Owl	6	1	8	5.5
Boreal Owl	3	1	10	—

Laboratory are too general for any in-depth assessment of mortality; however, data from the RRC and my questionnaires may give a more accurate picture as to the incidence of various mortality factors in the Great Lakes area. From my own observations as well as those of others, roads appear to play an important role in discovered raptor deaths (Table 3). I was informed by Dr. Pat Redig (pers. comm.) from RRC that the most frequent causes of accidents (Table 4) are moving vehicles.

Table 3. Bird-of-Prey Mortality Records (273) as Reported by DK and Others

Species	Number	Natural			Man Caused			
		# Recorded	Predator Kill	Other	Road Kill	Trap	Shot	Other Unknown
Osprey	1	—	—	—	—	—	1	—
Goshawk	14	—	3	1	4	4	2	—
Cooper's Hawk	11	2	—	—	4	3	2	—
Sharp-shinned Hawk	11	—	—	5	—	1	5	—
Red-tailed Hawk	34	1	—	9	8	12	3	1
Red-shouldered Hawk	7	—	—	1	1	3	2	—
Swainson's Hawk	1	—	—	1	—	—	—	—
Broad-winged Hawk	35	5	—	27	—	2	—	1
Am. Rough-legged Hawk	2	—	—	1	1	—	—	—
Harrier	0	—	—	—	—	—	—	—
Golden Eagle	1	—	1	—	—	—	—	—
Bald Eagle	10	—	1	1	1	7	—	—
Merlin	4	—	—	1	—	2	1	—
Kestrel	12	—	—	12	—	—	—	—
Barn Owl	5	—	5	—	—	—	—	—
Great Horned Owl	50	—	3	12	20	8	3	4
Barred Owl	25	—	1	19	—	5	—	—
Long-eared Owl	6	—	—	6	—	—	—	—
Short-eared Owl	5	—	—	1	—	—	4	—
Screech Owl	11	—	—	8	1	1	1	—
Saw-whet Owl	14	2	1	7	—	—	1	3
Snowy Owl	6	—	—	1	2	1	—	2
Great Gray Owl	4	—	1	2	—	1	—	—
Boreal Owl	1	—	—	1	—	—	—	—

In conclusion, data from banding records may be too general for drawing any in-depth conclusions about raptor mortalities. However, they do provide some indication as to expected band return frequencies and raptor longevity. Other sources of information indicate that man plays an important role in mortality of raptors, especially from vehicular collisions. Birds killed along roadways are obviously detected more often by man than birds killed away from roads, and, before an accurate assessment of the incidence of mortality causes can be made, a study should be done to determine the incidence of mortalities that usually go undetected by man.

**Table 4. Bird-of-Prey Mortality Records (1,051) as Reported by  
Raptor Rehabilitation Laboratory, U of M. (RRC)  
1974-1979**

Species	Number	Natural			Man Caused				Unknown
		Recorded	Predator Kill	Other	Road Kill	Trap	Shot	Other	
Osprey	14	—	—	1	—	0	6	7	0
Goshawk	21	—	—	10	—	1	5	3	2
Cooper's Hawk	16	—	—	8	—	1	0	6	1
Sharp-shinned Hawk	19	—	—	0	—	0	3	16	0
Red-tailed Hawk	213	—	—	23	—	18	63	85	24
Red-shouldered Hawk	12	—	—	2	—	1	0	8	1
Swainson's Hawk	5	—	—	0	—	0	4	1	0
Broad-winged Hawk	94	—	—	6	—	1	24	61	2
Am. Rough-legged Hawk	47	—	—	0	—	8	16	23	0
Harrier	11	—	—	0	—	1	3	7	0
Golden Eagle	18	—	—	2	—	3	9	4	0
Bald Eagle	88	—	—	9	—	13	28	25	13
Merlin	2	—	—	0	—	0	2	0	0
Kestrel	139	—	—	2	—	1	6	115	15
Barn Owl	0	—	—	0	—	0	0	0	0
Great Horned Owl	168	—	—	10	—	37	23	85	13
Barred Owl	52	—	—	4	—	5	7	31	5
Long-eared Owl	23	—	—	1	—	0	4	15	3
Short-eared Owl	16	—	—	0	—	1	2	12	1
Screech Owl	54	—	—	3	—	1	4	40	6
Saw-whet Owl	14	—	—	0	—	0	1	12	1
Snowy Owl	20	—	—	2	—	1	9	8	0
Great Gray Owl	4	—	—	0	—	0	2	2	0
Boreal Owl	1	—	—	0	—	0	0	1	0

**Table 5. Bird-of-Prey Mortality Records (5,697) as Reported by the Bird Banding Laboratory (BBL)  
Through August 1979**

Species	Number	Natural			Man Caused				Unknown
		Recorded	Predator Kill	Other	Road Kill	Trap	Shot	Other	
Osprey	447	5	—	36	8	0	0	83	315
Goshawk	120	1	—	3	8	0	0	15	93
Cooper's Hawk	136	1	—	5	8	0	0	15	107
Sharp-shinned Hawk	484	11	—	9	22	0	0	137	305
Red-tailed Hawk	1031	7	—	65	147	0	0	59	753
Red-shouldered Hawk	104	1	—	4	19	0	0	4	76
Swainson's Hawk	54	3	—	0	13	0	0	4	34
Broad-winged Hawk	37	0	—	1	9	0	0	2	25
Am. Rough-legged Hawk	48	0	—	2	14	0	0	2	30
Harrier	114	2	—	9	3	0	0	7	93
Golden Eagle	130	0	—	10	9	0	0	19	92
Bald Eagle	173	0	—	14	7	0	0	16	136
Merlin	35	2	—	0	6	0	0	2	25
Kestrel	1017	29	—	58	158	0	0	186	586
Barn Owl	572	5	—	24	88	0	0	71	384
Great Horned Owl	525	6	—	24	97	0	0	63	345
Barred Owl	50	1	—	3	11	0	0	2	33
Long-eared Owl	36	0	—	2	2	0	0	2	30
Short-eared Owl	21	0	—	1	6	0	0	1	13
Screech Owl	410	10	—	23	89	0	0	23	35
Saw-whet Owl	89	2	—	0	13	0	0	5	36
Snowy Owl	55	0	—	4	8	0	0	2	41
Great Gray Owl	6	0	—	0	3	0	0	1	2
Boreal Owl	3	0	—	1	0	0	0	0	2

Table 6. Percent of 7,021 Records by Major Mortality Factors

Cause of Mortality	Keran and Others (273)	Raptor Rehab Lab (1051)	Banding Lab (5697)
<i>Natural Causes</i>			
Predator kill	3.7	—	1.5
Other	5.9	7.9	5.2
<i>Man Caused</i>			
Road kill	42.5	—	13.1
Trap	15.4	8.8	—
Shot	18.7	21.0	—
Other	8.8	54.0°	12.7
<i>Unknown</i>	4.0	8.3	67.4

\*This includes some accidents that are vehicular in nature.

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