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# Illegal Deaths and Injuries to Wisconsin's Large Wild Birds: Identifying and Evaluating Recent Occurrences

Phase 1 Project Report

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## About this Work:

This report was prepared by Kerry Beheler, a member of the Wildlife Work Group for Wisconsin's Green Fire (WGF). Beheler has expertise in wildlife and veterinary health pathology and diagnostic investigations, having served as a Wildlife Health Specialist for the Wisconsin Department of Natural Resources among other roles.

WGF's mission is to advance science-informed analysis and policy solutions that address Wisconsin's greatest conservation challenges. As a part of that mission, WGF approved Phase I of this project.

Funding for this research project came in part from a \$5,000 grant from the James F. Dutton Foundation of Merrill.

WGF wildlife biology and wildlife management subject matter experts, and WGF members, provided investigative and evaluative in-kind work with a value of \$2,000.

The WGF administrative staff and science team conducted project management and financial management services, as well as standard peer review.

*Cover Image: Red-tailed hawk,  
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## Project Scope and Brief Summary

In recent years, Wisconsin (WI) wildlife rehabilitators have noted an increased number of illegal shootings and harassment of non-hunted wild birds including bald eagles, hawks, owls, loons, swans, cranes, and other large WI bird species (personal communication, E. LeMoine and M. Gibson, May 2021).

While the Wisconsin Department of Natural Resources (WDNR) has the responsibility to collect information on mortalities and violations of law, they have limited capacity to evaluate illegal killings and harassment of these non-hunted wild birds. WGF requested funding from the James E. Dutton Foundation in June 2022 to initiate a project dedicated to quantifying and evaluating trends in illegal harassment, injury, and death of Wisconsin's large non-hunted wild birds.

The limited funding received by Wisconsin's Green Fire (WGF) for this project to date was used for a Phase 1 portion of the project, which included an initial outreach to the WDNR and the WI wildlife rehabilitation community to assess data availability, individual records review of data available, and a qualitative analysis of the data available. Statistical analysis of the data will await the acquisition of a larger database. Finally, we provide recommendations for development of a comprehensive long-term and ongoing data collection and analysis project in collaboration with WDNR and WI wildlife rehabilitators.

## Materials and Methods

Phase 1 included developing a list of licensed WI wildlife rehabilitators, followed by outreach to the WDNR Wildlife Rehabilitation Advisory Committee, the WI Wildlife Rehabilitation Association, and individual wildlife rehabilitators. The outreach included sharing the project scope and goals as well as enlisting collaborators to acquire data. Following the outreach, we received support from the WDNR Wildlife Rehabilitation Advisory Committee, and several wildlife rehabilitators agreed to share hard copies of their required annual rehabilitation records. Records were voluntarily submitted to this project or were received through an open records request.

## Wildlife Rehabilitation Centers and Records

Four wildlife rehabilitation centers were selected for records review as they had consistent records over a 5-year time period: 2017 to 2021. Records were evaluated from the Raptor Education Group Inc (REGI; north central WI, avian expertise), Wild Instincts (W.I.; north central WI), The Raptor Center (TRC, at University of Minnesota School of Veterinary Medicine; northwest and west WI, raptor focus exclusively), and Dane County Humane Society (Dane; central and southern WI). Records were evaluated from these centers based on federal and state permits, case submissions, records integrity, and geographic location.

Phase 1 reviewed and evaluated records for five years (2017-2021). Multiple sequential years of data from the same centers allowed for comparative records review and qualitative analysis. It must be noted that not every wildlife rehabilitation center used the same descriptors or had access to the same diagnostic tools. The specificity and detail of the records tended to be related to the rehabilitation center's level of training and financial capabilities (i.e., TRC associated with the Minnesota School of Veterinary Medicine had greater access to training and diagnostic tools).

Records were assigned to the following general incremental annual time periods: Winter: January through March; Nesting: April and May (includes legal spring turkey hunting season); Fledging: June through August; Dispersal: September through December (includes legal upland game, waterfowl, and deer gun hunting seasons).

An initial data analysis methodology was formulated after wildlife rehabilitation records were received by WGF.

**Data Included:** Records from a live bird with a determined cause of admission, and additional descriptors or qualifiers such as type of injury (impact trauma - stationary or mobile, skeletal and/or soft tissue trauma, etc.), nutritional condition, toxicosis, etc.

**Data Excluded:** Records from birds dead on arrival, nestlings, fledglings, those with an undetermined cause of admission, and/or no final outcome/diagnosis associated with the record.

## Results

Over 27,000 individual records were reviewed from these four rehabilitation centers. Each center used their own unique recording system. Records submitted from some centers included non-avian or species not of interest for this analysis (mammals, reptiles, songbirds, waterfowl, hunted species, etc.). Phase 1 identified and included in the broad analysis 2298 records of interest which had reliable diagnoses. Hand tallied counts of cases were 435 in 2017; 383 in 2018; 457 in 2019; 519 in 2020; and 504 in 2021. No statistical parameters were used in the Phase 1 broad analysis.

Records review found 34 species of interest: birds of prey (raptors, owls, eagles, vultures): turkey vulture, northern goshawk, Cooper's hawk, sharp shinned hawk, northern harrier, rough legged hawk, red tailed hawk, broad winged hawk, red shouldered hawk, golden eagle, bald eagle, osprey, peregrine falcon, merlin, American kestrel, Eastern screech owl, great horned owl, long eared owl, short eared owl, barn owl, barred owl, great gray owl, boreal owl, and saw whet owl.

Large water birds and cranes: common loon, American white pelican, tundra swan, trumpeter swan, great egret, great blue heron, green heron, black crowned night heron, American bittern, sandhill crane.

Shooting incidents are presented in Table 1 by species and year, and in Table 2 by time- period, year, and the wildlife rehabilitation center that received the bird.

Seventy birds were determined to have been shot. More birds were shot in 2021 than in any previous year (19 in 2021, 12-13 in 2017 through 2020), but there were more total submissions in 2021. In each of the 5 years, 4-5% of large non-hunted birds had been shot. Red-tailed hawks were the most frequently shot (16), followed by bald eagles (11), trumpeter swans (9), turkey vultures (7), and sandhill cranes (6). Red-tailed hawks, bald eagles, and trumpeter swans were shot at least once in every year, and sandhill cranes were shot in four of the five years evaluated. Although large waterbirds accounted for only 126 of the total 1,394 birds submitted (9%), 21 of these waterbirds were shot (21/126, 16.67%).

Shooting occurrences were highest in number during the months of September through December (28/70, 40%), and lowest in June through August (11/70, 15.7%) (Table 2). Birds who were shot, recovered alive and injured, and received by wildlife rehabilitation centers, came from all across WI.

**Table 1. Shooting of Wisconsin Large Non-hunted Birds: Species and Year**

Year:	2017		2018		2019		2020		2021		TOTAL	
	# birds shot	# birds submitted	# birds shot	# birds submitted	# birds shot	# birds submitted	# birds shot	# birds submitted	# birds shot	# birds submitted	# birds shot	# birds submitted
<b>Species</b>												
Common loon			1	11			1	14			2	25
American white pelican					1	5					1	5
Tundra swan	1	2					1	5	1	2	3	9
Trumpeter swan	2	3	1	4	1	3	1	9	4	12	9	31
Sandhill crane	3	21	1	14			1	7	1	14	6	56
Turkey vulture			1	16			1	18	5	17	7	51
Northern goshawk			1	1							1	1
Cooper's hawk	2	36	1	32			1	22			4	90
Rough legged hawk					2	11					2	11
Red-tailed hawk	3	57	4	97	5	74	2	75	2	67	16	370
Red shouldered hawk									1	2	1	2
Bald eagle	1	131	1	124	3	104	2	123	4	123	11	605
Osprey							2	8	1	4	3	12
Merlin							1	13			1	13
Great horned owl			2	56	1	57					3	113
<b>Total shot/submitted</b>	<b>12</b>	<b>250</b>	<b>13</b>	<b>355</b>	<b>13</b>	<b>254</b>	<b>13</b>	<b>294</b>	<b>19</b>	<b>241</b>	<b>70</b>	<b>1394</b>
<b>Total species per year</b>	<b>6</b>		<b>9</b>		<b>6</b>		<b>10</b>		<b>8</b>			

**Table 2. Shooting of Wisconsin Large Non-hunted Birds: Annual Time Period and Wildlife Rehabilitation Center**

Year:	2017	2018	2019	2020	2021	TOTAL
<i>Time Period</i>						
January-March	3	2	5	1	4	15
April-May*	3	0	2	5	6	16
June-August	1	4	1	2	3	11
Sept-December+	5	7	5	5	6	28
Totals by Year	12	13	13	13	19	70
Rehabilitation Center^	REGI 4	REGI 8	REGI 8	REGI 9	REGI 15	
Totals	Dane 6 W.I. 2	Dane 4 TRC 1	Dane 4 W.I. 1	Dane 2 W.I. 1 TRC 1	Dane 2 W.I. 1 TRC 1	

\* Spring turkey legal hunting season  
 + upland game, waterfowl, deer gun legal hunting seasons  
 ^ REGI: Raptor Education Group Inc  
 Dane: Dane County Humane Society  
 W.I. : Wild Instincts  
 TRC: The Raptor Center

Overall, the most frequently recorded causes of determined mortality in WI large non-hunted birds were:

- trauma from collision with moving or stationary object (vehicle, window, road, iced over lake, etc.);
- poor nutritional condition (starvation, emaciation, internal parasites, etc.);
- lead toxicosis (determined using a diagnostic measurement);
- West Nile Virus infection (determined using a diagnostic assay);
- entanglement with objects (fishing line, fence, glue trap, sporting equipment, etc.).

These injuries and mortalities were not individually tallied during the Phase 1 portion of this project but can be included in a more robust analysis.

Records from 13 other wildlife rehabilitation centers only for the year 2021 were received via WGF public records request of the WDNR. 4,000 records from five of these centers were evaluated (Bay Beach Wildlife Sanctuary, Coulee Region Humane Society, Hoo's Woods Raptor Center, Northwoods Wildlife, Wisconsin (Milwaukee) Humane Society). The 321 records of interest from these centers were not included in the Phase 1 five-year analysis, as no trends could be detected for a 1-year time period. There was one record of a gunshot bald eagle from these 321 records (Bay Beach Wildlife Sanctuary).

## Discussion and WGF Recommendations

In each of the years 2017-2021, illegal shooting was diagnosed as the cause of injury for 4-5% of non-hunted large birds in our data set. More birds were illegally shot during the months when people are outdoors with firearms—September through December—during legal hunting seasons. These shootings may be a result of opportunity, misidentification, or malice.

During the next phase of this project, the goals are to:

- Standardize methods of data collection with collaborating rehabilitators.
- Expand the data set to conduct a trend analysis of illegal shooting over a wide geographic area of Wisconsin.
- Quantify all factors associated with non-hunted large bird injury and mortality in Wisconsin.

Over the long-term, WGF is interested in identifying policy and education actions, and forming partnerships to reduce the occurrence of these illegal shooting incidences, ultimately working to reduce mortality in these bird species.

To fully understand the extent, severity, and geographic distribution of these illegal shooting occurrences, further work is needed including:

1) [Hire a dedicated Project Coordinator](#) who can create a consistent database, enter and collate the data, and perform statistical analyses on the myriad details and amount of data involved. The Project Coordinator must have current working knowledge of spreadsheet programs. Utilizing 10 years of records can be done (2013-2023), yet this will involve well over 300,000 data points. Given the expertise of the Project Coordinator, analysis on this large scale is achievable. The Project Coordinator will work with science experts, wildlife rehabilitators, WDNR, and WGF in data exploration and analysis. Temporal and spatial trends across WI on injured and illegally killed birds using a Geographic Information System (GIS) can be evaluated. A technical paper of the findings can be published.

2) [Standardize recording of data](#): Of the records reviewed to date during Phase 1, each wildlife rehabilitation center used a different recording format (some records were handwritten, some centers varied the data entry format over the years, and other variations). Although



extensive data and records are available from wildlife rehabilitation centers in multiple formats, there is currently no cohesion or consistency in reporting. Before any meaningful analysis can be performed, comprehensive data sets presented in a consistent format are needed.

WGF suggests wildlife rehabilitation centers follow The Raptor Center or Dane County Humane Society database reporting styles, using two qualifiers describing initial injury, and including more detail in the reporting. Suggested reporting examples include:

- collision (moving vs stationary) **and** toxicity (diagnostic test and result);
- nutritional (malnourished, starvation/emaciation) **and** entanglement with fishing line;
- skeletal injury and/or skeletal fracture **and** projectile found on radiograph (bullet, arrow).

3) [Determine if WDNR mortality records should be included as part of the overall data set](#): These WDNR mortality records are not wildlife rehabilitation records, yet they are an important data source. These records would likely be birds found dead and given to field staff for diagnostic necropsy, or WDNR Law Enforcement records. Where available, data can be collected on any law enforcement actions (state and federal) taken with these incidents, including prosecutions. Based on the results, WGF and partners will discuss the implications and develop recommendations on how to best address the issues.

4) [Determine trends in other mortality factors and emerging diseases](#) including lead poisoned birds, Avian Influenza (during spring/summer 2022, birds of prey were significantly affected by AI), and other emerging diseases. While not a specific objective of this project, records from wildlife rehabilitators will contain this information, and data can be examined for further potential.

5) [Find and increase funding sources](#): Wildlife rehabilitators need a consistent and reliable source of funding to perform their basic functions. To perform more detailed incident recording and diagnostic testing, they need even more reliable funding. WGF could assist wildlife rehabilitation efforts by:

- Searching for grants to fund this work.
- Supporting RAWA and advocating for funds dedicated to wildlife rehabilitation.
- Partnering with other specific advocacy groups (Wisconsin Ornithological Society, LoonWatch, Natural Resources Foundation: Birdathon, etc.).
- Setting up a separate fund dedicated to a wildlife rehabilitation database, and
- Funding a WDNR LTE/intern or WGF Conservation Fellow dedicated to data entry and organization.
- Increasing support for WDNR activities, including encouraging WDNR to change their policy towards non-game species. Currently, WDNR Law Enforcement has no statewide directive to respond to requests for assistance with injured wildlife.

6) [Work with partners to identify targeted strategies to reduce the incidents](#). WGF can form deeper partnerships with the WI Rehabilitators Association, including attending the Wisconsin Wildlife Rehabilitation meeting 9-10 February 2024. This meeting would be an opportunity to present Phase 1 findings, discuss the issue in more detail, solicit ideas, plan for broader public outreach, identify and refine project parameters, among other efforts.

7) [Over the long-term, work to reduce the occurrence of illegally shot large non-hunted birds in Wisconsin](#). To raise public awareness, communication and outreach to multiple groups is needed. Project partners and collaborators will be better supported in their efforts to reduce illegal activity with new approaches and ideas. WGF can involve ethical hunters, non-hunters, and other groups in public awareness campaigns to reduce illegal shootings. WGF can work with, or organize, a coalition of hunting groups to speak out on this issue. The Wisconsin Conservation Congress Spring Hearings can be used to start building awareness and discussion on the issue.

8) Questions answered for the James Dutton Foundation Injured Wildlife Project, as a requirement of receiving the grant funding.

*1. What are the two most important activities that your grant produced?*

We found there is a great deal of useful data that must be organized and assessed before any comprehensive analysis can begin.

There may be an increasing trend of illegal injury and death amongst WI large non-hunted birds, but to reach a conclusion more funding is needed to expand and fully analyze the databases.

*2. How did the funded program or project positively impact the environment or animal life or how was the organization able to do so after funding?*

WGF has identified more questions that can be answered which will positively affect the birds, wildlife rehabilitators, and citizens of WI.

*3. How do you know these results were attained, and how have you measured its success?*

We have identified the need for consistency and quantitation in occurrence reporting.

*4. What results or stories best illustrate how the grant positively impacted the lives of people?*

The WI wildlife rehabilitation community has positively and gratefully accepted the assistance of WGF with this issue. We can assist further with adequate funding and hiring a dedicated project coordinator.

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## Appendix

**1. Project timeline and funding to date:** The project concept began in March 2022. In late June 2022, Wisconsin's Green Fire (WGF) requested funding from the James E. Dutton Foundation (\$20,000 requested, \$5000 granted). WGF contracted with Kerry Beheler for project involvement in late February 2023 to spend approximately 50 hours of time on the project. Kerry spent 60 hours on the project. Contact Information: Kerry Beheler [kerry.beheler@gmail.com](mailto:kerry.beheler@gmail.com) (608-437-6938 land line phone),

2. Suggested spreadsheet organization for wildlife rehabilitators' data:

- One (1) sheet per year
- Species organized alphabetically

Categories will include:

- a) Number of individuals
- b) Date of submission
- c) First descriptor: injury type general/cause of admission
- d) Second descriptor: specific diagnosis, assays used
- e) Assay results
- f) Status outcome
- g) County of collection
- h) Wildlife rehabilitation facility

## Supplemental information

**Wildlife Rehabilitation in Wisconsin:** Wildlife rehabilitation is a licensed activity in Wisconsin (WI) and the WI Department of Natural Resources (WDNR) defines it as “providing temporary care to an injured, orphaned or ill wild animal to release it back into its environment.” The state of WI does not financially compensate wildlife rehabilitators for their time, or the associated costs and expenses involved with wildlife rehabilitation. Many wildlife rehabilitators volunteer or donate their time and money and conduct fundraising activities to pay for the expenses.

The WDNR requires wildlife rehabilitators to complete and submit an annual report every calendar year. A federal permit and a federal annual report are required for the rehabilitation of wild migratory birds listed on the federal Endangered and Threatened Species lists.

More information can be found at WDNR wildlife rehabilitation:

- <https://dnr.wisconsin.gov/topic/WildlifeHabitat/permitting.html>
- <https://dnr.wi.gov/files/pdf/forms/2300/2300-302.pdf>

and Federal migratory bird guidelines

- [https://fwsepermits.servicenow.com/fws?id=fws\\_kb\\_view&sys\\_id=7af88d7d1bd50101f45dbdbe54bcbea](https://fwsepermits.servicenow.com/fws?id=fws_kb_view&sys_id=7af88d7d1bd50101f45dbdbe54bcbea)

A Wildlife Rehabilitation Advisory Committee provides recommendations to the WDNR on wildlife rehabilitation topics including specific guidance, reviews of regulations and policies, and public education and outreach. A professional WI Wildlife Rehabilitators Association membership is encouraged, but not required, for those who hold a WI wildlife rehabilitation permit.

### 1. WI Wildlife Rehabilitators Association <https://wiwildlife.org/about>

This is a professional organization that seeks to “Preserve Wisconsin’s wildlife, facilitate networking among wildlife rehabilitators, promote professionalism and ethical excellence in the practice of wildlife rehabilitation, improve management and outcomes for wildlife in the care of our membership, foster an understanding of, and support for wildlife rehabilitation among wildlife management agencies, the veterinary community and the general public through our member newsletter, website, shared communications, roundtables, and annual conference.”

### 2. An article that could inform our work was published by the International Crane Foundation in their spring newsletter (<https://savingcranes.org/whooping-crane-shootings-what-we-know-and-why-it-matters>).

ICF did an analysis of whooping crane shootings since 1967. A key conclusion they reached is captured in this paragraph:

The International Crane Foundation has taken this information and processed it through the lens of situational crime prevention and routine activity theory. Under this theory, for a crime to take place, there must be a suitable target — a motivated offender — and a lack of guardianship of the target. By knocking out one or more factors, a crime cannot occur. After reviewing the 25 common strategies to prevent crimes, we determined that a campaign to raise awareness and pride in the species would address many of the strategies.

### 3. Hunter ethics: Killing contests represent a breakdown in the North American Model of Wildlife Conservation.

There is a growing emphasis on simply killing and no attempt to make use of the animals. Shooting of eagles, swans, loons, and other birds represents a major breakdown in hunter ethics (<https://mountainjournal.org/hunting-in-america-faces-an-ethical-reckoning>).