12-2012

Interior Least Tern Powerline Collision on the Lower Platte River

Lauren R. Dinan
Nebraska Game and Parks Commission, ngpc.nongamebird.temp@nebraska.gov

Joel G. Jorgensen
Nebraska Game and Parks Commission

Mary Bomberger Brown
University of Nebraska-Lincoln

INTERIOR LEAST TERN POWERLINE COLLISION ON THE LOWER PLATTE RIVER—Collisions with electrical powerlines are a well-known documented cause of avian mortality (Avian Power Line Interaction Committee [APLIC] 1994, Savereno et al. 1996). Mortality caused by collisions with powerlines can be an important concern for many bird species, but is a serious conservation problem for threatened and endangered species because any mortality can have biological and legal ramifications (Janss 2000). Loss of individuals, particularly breeding adults, from an already small population may impede a species' recovery by reducing reproduction and recruitment into the breeding population. The death of an individual from a threatened or endangered species as a result of a collision may constitute "take" as defined by the federal Endangered Species Act (1973; 16 U.S.C. 1531–1544.) and the federal Migratory Bird Treaty Act (1918; 16 U.S.C. 703–712). Companies and/or individuals may be prosecuted when powerline collisions occur, particularly if recommendations intended to reduce the risk of collision, provided by the United States Fish and Wildlife Service (USFWS) regarding the placement of the powerlines, have not been followed.

The interior least tern (*Sternula antillarum athalassos*) is a federally endangered species (50 Federal Register 21784–21792) that breeds on and along the Mississippi and Missouri rivers and their tributaries (Thompson et al. 1997). The species' principal nesting habitat includes sparsely vegetated sandbars within main river channels, but in some cases birds will nest on human-created habitats such as waste sand from dredging or mining operations (Thompson et al. 1997). Interior least terns are small and agile flyers able to readily avoid powerline collisions. In fact, collisions with powerlines were not identified as a potential threat to recovery in the interior least terns' recovery plan (United States Fish and Wildlife Service [USFWS] 1990). Here, we provide the first documented report of an interior least tern mortality that we are aware of, caused by a collision with a powerline, and comment on the conservation implications of the incident.

On 7 June 2012, we recovered a dead male adult interior least tern on a lower Platte River sandbar in Saunders County, Nebraska. We found the tern lying on the sand directly below a set of transmission lines mounted on tall steel H-frame structures; the set included five individual lines. The transmission lines crossed the river and a large midstream sandbar (Fig. 1). We discovered the tern's carcass in a colony that included approximately 30 adult terns associated with 13 nests, all early in the incubation period. All five transmission lines were marked with yellow, spiral bird flight diverters (APLIC 1994). These diverters were spaced approximately 15 m apart in a staggered pattern over the entire 485 m wide river crossing. The bird flight diverters were placed on the transmission lines following the recovery of a dead black tern (*Chlidonias niger*) at the same location in 2009, out of concern that the line could present risks to the legally protected interior least tern, piping plover (*Charadrius melodus*), and bald eagle (*Haliaeetus leucocephalus*) which regularly occur in the area. The transmission lines also were marked with nine yellow, white, and orange aerial marker spheres which are traditionally intended to alert aircrafts to the presence of the lines, but have occasionally been installed in an attempt to reduce bird collisions (APLIC 1994).

The interior least tern carcass was fresh and in relatively good condition. Immediately after collection, the Nebraska Game and Parks Commission (NGPC) sent the carcass to the United States Geological Survey (USGS) National Wildlife Health Center in Madison, Wisconsin, where a necropsy was conducted. The results from the diagnostic evaluation indicated the tern was well nourished with no puncture wounds. The necropsy showed extensive hemorrhaging into the left lung and a blood clot in the left lobe of the liver; the suspected cause of death was blunt force trauma to the left side of the body (J. L. Buckner, USGS National Wildlife Health Center, unpublished data). The results exclude possible causes of death such as emaciation, disease, or predation. Other than the transmission lines, no other vertical structures were within 150 m of where the tern carcass was found. Thus, the mortality is consistent with collision with a transmission line and all other explanations have been satisfactorily excluded.

To our knowledge, this is the first report documenting powerline collisions as a source of interior least tern mortality. Henderson el al. (1996) noted that terns are at a lower risk of powerline collisions due to their small size and agile flight. However, size and flight agility may not be the only factors that influence a species' susceptibility to powerline collisions. Behavior, habitat use, time of day, wind speed, weather conditions, and age may influence a species' susceptibility to powerline collisions. Interior least terns' courting and pair-bonding behavior may increase their susceptibly to powerline collisions. When interior least terns are forming pairs, they engage in aerial chases with other terns (Thompson et al. 1997), such behaviors may make interior least terns more susceptible to collisions. The mortality we observed occurred early in the nesting season, shortly after birds arrived at breeding sites, and at a time when pairs were being formed and nests were initiated. Henderson et al. (1996) reported that adult common terns (*Sterna hirundo*) were more susceptible to powerline collisions during chick rearing when the frequency of adult tern flights to and from the colony increased >3 times. Additionally, adult terns flew closer to the electrical wires during the nestling and fledgling phases than during the courtship and incubation phases, due to the increased frequency of foraging flights necessary to feed their chicks (Henderson et al. 1996). This increase in a species susceptibility to powerline collisions also may be true for other tern species.

The location of a powerline is an important determinant of whether collisions occur or can be avoided (APLIC 1994, Henderson et al. 1996). Powerlines located in habitats that are regularly frequented by species obviously have an increased probability of being encountered (Janss 2000). In

the case of interior least terns, powerlines that cross rivers, especially those that cross directly over large midstream sandbars or other traditional nesting sites, present higher risk (Henderson et al. 1996). Sandbar location, size and elevation can be dynamic, however there are static variables known to influence tern nesting habitat selection that can be used to predict the location of tern colonies (Jorgensen et al. 2012). For example, Jorgensen et al. (2012) documented that interior least tern nesting incidence increased with increasing river channel width, and that interior least terns avoid nesting on sandbars located in narrow river channels. The location where this collision and mortality occurred was in one of the widest channels (84th percentile) in the lower Platte River (J. G. Jorgensen, NGPC, unpublished data), indicating that this area is likely to be more attractive to interior least terns than other narrower sections of the river.

The mortality incident summarized here indicates interior least terns are vulnerable, albeit rarely, to powerline collisions that can result in mortality. This mortality incident shows that marking powerlines that are placed in areas commonly used as a feeding, nesting, or roosting site, or dividing a habitat, with bird flight diverters or other types of line markers does not completely eliminate collision risk. The problem of bird mortality resulting from powerline collisions has become more important as the growing demand for electrical power increases and the number of kilometers of powerlines needed to distribute that power increases (APLIC 1994). This increase requires utility companies and state and federal agencies to be even more conscious of environmental factors when choosing locations for new transmission lines. Entities hoping to avoid or reduce avian collision risks should use information about habitat use when making powerline placement decisions.

Major funding was provided by the Nebraska Wildlife Conservation Fund and the State Wildlife Grant Program. We thank Jennifer L. Buckner with the USGS National Wildlife Health Center in Madison, Wisconsin for conducting the necropsy and diagnostic tests. We also thank the two anonymous reviewers that provided useful comments that improved the manuscript.—*Lauren R. Dinan[1], Joel G. Jorgensen, and Mary Bomberger Brown. Nongame Bird Program, Nebraska Game and Parks Commission, Lincoln, NE 68503, USA (LRD, JGJ). School of Natural Resources, University of Nebraska-Lincoln, Lincoln, NE 68583, USA (MBB). [1]Corresponding author email address:ngpc.nongamebird.temp@nebraska.gov.*

LITERATURE CITED

Avian Power Line Interaction Committee [APLIC]. 1994. Mitigating bird collisions with power lines: the state of art in 1994. Edison Electric Institute, Washington, D.C., USA.

Henderson, I. G., R. H. W. Landgston, and N. A. Clark. 1996. The response of common terns *Sterna hirundo* to power lines: an assessment of risk in relation to breeding commitment, age and wind speed. Biological Conservation 77:185–192.

Janss, G. F. E. 2000. Avian mortality from power lines: a morphologic approach of a species-specific mortality. Biological Conservation 95:353–359.

Jorgensen, J. G., M. B. Brown, and A. J. Tyre. 2012. Channel width and interior least tern and piping plover nesting incidence on the lower Platte River, Nebraska. Great Plains Research 22:59–67.

Savereno, A. J., L. A. Savereno, R. Boettcher, and S. M. Haig. 1996. Avian behavior and mortalities at power lines in coastal South Carolina. Wildlife Society Bulletin 24:636–648.

Thompson, B. C., J. A. Jackson, J. Burger, L. A. Hill, E. M. Kirsch, and J. L. Atwood. 1997. Least tern (*Sterna antillarum*) *in* A Poole and F. Gill, editors. The Birds of North America, No. 290. The Academy of Natural Science, Philadelphia, PA, and the American Ornithologist' Union, Washington, D.C., USA.

U.S. Fish and Wildlife Service [USFWS]. 1990. Recovery plan for the interior population of least tern (*Sterna antillarum*). U.S. Fish and Wildlife Service, Twin Cities, Minnesota, USA.

Submitted 11 November 2012. Accepted 19 December 2012. Associate Editor was Chadwick P. Lehman.

Figure 1. Dead adult interior least tern (*Sternula antillarum athalassos*) photographed on 7 June 2012 on a lower Platte River sandbar near Ashland, Saunders County, Nebraska. Photograph by Joel G. Jorgensen.