RESOURCE NOTE

NO. 84 DATE 04/23/07

Effectiveness of Raptor Perch-Deterrent Devices on Power Poles for Reducing Secondary Effects on Prey Species

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Background

In the early 1960s, the public became concerned about the sharp decline in raptor populations, mainly because of the negative effects of pesticides on raptor reproductive success. Thanks to conservation measures, most raptor populations have now recovered to viable numbers. Land management agencies are now shifting priorities from increasing raptor populations to protecting other sensitive species. For example, in the sage–steppe ecosystem, land managers are particularly concerned about the decline of the greater sage-grouse (*Centrocercus urophasianus*) and other sensitive sage-obligate species.

Tall perching structures are not common in the treeless, sage–steppe habitat, so power-line structures can give raptors a competitive advantage over sage-obligate prey species. This advantage can lead to higher than normal raptor numbers in the area. Large structures also enable the encroachment of traditional tree-nesting and perch-hunting raptors, such as the red-tailed hawk (*Buteo jamaicensis*). Because of these effects and others, large power-line projects fragment the sage–steppe habitat and probably contribute to lower populations of sensitive sage-obligate prey species.

Raptor perch-deterrent devices have long been used by power companies to discourage raptors from using dangerous parts of power structures. But they have not traditionally been used to prevent perching on entire structures to reduce secondary effects on prey species. Few data concerning the effectiveness of perch deterrents are available, so this study was conducted to help land managers make more informed decisions regarding these issues.

Study Subject

In 2003, an 18-mile power transmission line was constructed on lands managed by the Bureau of Land Management (BLM) Kemmerer Field Office (KFO). An agreement was made with the power company that the line would not have to follow an existing energy corridor as long as perch-deterrent devices were installed on every H-brace structure. The power structures were already designed to prevent raptor electrocution, so the goal was to reduce raptor predation on sensitive sage–steppe species such as sage-grouse.

Figure 1. Mission Environmental Bird Deter Device.

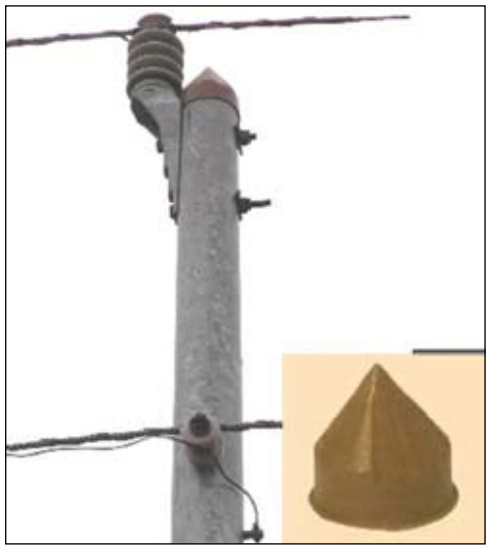

Figure 2. Kaddas Pole-Kap Device (Kaddas Enterprises Inc.).

The power company asked the BLM biologist to research perch deterrents for the project. Mission Environmental (ME) Bird Deter devices were installed on all horizontal surfaces (Figure 1). This type was chosen because it cost less per unit than other brands, and was the only device for which we could find any information on effectiveness. For example, the company had statistics showing how bird electrocution rates declined when ME devices were used on transmission lines in Africa. Also, another small study using captive hawks showed 100% avoidance of structure components installed with ME devices. To discourage raptors from using the top of vertical poles, Pole-Kap (PK) devices (Kaddas Enterprises Inc.) were installed (Figure 2). No data could be found for comparing pole top deterrents, so this brand was used because it was relatively inexpensive and easily available.

Study Design

In fall 2004, KFO staff and interns designed and conducted a small study to determine the effectiveness of the ME and PK devices for deterring raptor perching on entire power structures.

Figure 3. Perch-deterrent devices installed on surveyed, power-line structure.

Two interns concurrently surveyed 107 structures on the new "deterrent" power line (Figure 3), and 107 structures on an older "control" line, without perch deterrents. The interns drove trucks along roads near the power lines in 70-minute survey blocks. On a typical day, six surveys were conducted between 7:30 a.m. and 3:30 p.m. Surveys were run three times a week for 4 weeks.

All raptors and ravens that were perched on or in the area of the designated lines were counted. The species, number of birds, time of day, and GPS location were recorded. Each survey time block was considered a "new" survey and every raptor was counted, even though birds seen on the same structures over several different time blocks were probably the same individual. For purposes of this study, the important factor was comparing the number of birds using the power structures for each time block.

Results

After 86 hours of observation on each line, 159 raptors were documented perching on the control line structures and no raptors were on the structures with perch deterrents. Raptor species recorded were the American kestrel (*Falco sparverius*), golden eagle (*Aquila chrysaetos*), red-tailed hawk, osprey (*Pandion haliaetus*), prairie falcon (*Falco mexicanus*), and Swainson's hawk (*Buteo swainsoni*). Golden eagles and red-tailed hawks were seen the most often with 75 and 55 observations, respectively.

In addition, 43 common ravens (*Corvus corax*) were documented using the structures on the control line. Although no ravens were perched on the deterrent structures, one raven was seen perching on the deterrent line wire near a structure. No other raptors or ravens were seen perched on the wire of either line during this study.

A total of 47 raptors or ravens were counted near the control line either flying, on the ground, or on a nearby structure. Only three were spotted near the deterrent line.

Raptor use of the control structures decreased from morning to afternoon with an average of 3.76 birds seen per hour in the first period (7:30–8:40 a.m.), to 0.64 birds per hour in the last period (2:15–3:25 p.m.). Raven use remained relatively constant throughout the day.

Conclusions

This study shows that ME and PK raptor perch-deterrent devices can significantly reduce raptor use when installed on new transmission structures 1 year after construction. It also suggests that raptors use power structures as hunting perches, because they used them more in the morning when prey species are more active.

Finally, a total of 249 raptors and ravens were seen on or near the control line, versus 3 raptors and ravens on or near the new deterrent line. These data imply that raptors congregate around established power lines. Therefore, prey species, such as the sage-grouse, are less likely to be preyed on by raptors in open sage–steppe habitat without power lines.

As the demand for power increases in the United States, Federal land managers will be required to analyze and permit many new power transmission projects. At the same time, they are required to prevent the decline of sage-grouse populations and other sensitive sage-obligate species. To help land managers balance these often conflicting goals, more studies are needed to determine the true effects of power lines and perch deterrents on sensitive sage-obligate prey species.

Future Studies

This study was quick and simple. It was conducted with base funds, by interns, and squeezed into a heavy workload. A more in-depth study is presently being conducted in the Kemmerer Field Office.

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