

Malfunction Rates of Bird Flight Diverters on Powerlines in the Mongolian Gobi

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Abstract

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The Oyu Tolgoi (OT) project, one of the world's largest copper and gold mines, is located in Gobi Desert of Mongolia. To help meet its target of Net Positive Impact on key biodiversity features such as the Houbara bustard (*Chlamydotis undulata*) the OT installed bird flight diverters (BFDs include spiral and flapper devices) to its power transmission lines to reduce the risk of birds hitting the wires. Despite the many studies demonstrating that BFDs reduce collision rates, we could find no published information on malfunction rates of BFDs. In January 2013, we surveyed the physical function of 1,200 BFDs (e.g. 600 flappers and 600 spirals) in three sample areas on each of four lines of varying voltage and structure. Of the 600 flappers examined, 123 had malfunctioned within nine months of installation, while the malfunction rate of the 600 spirals studied was zero. Using a Generalized Linear Mixed Model, we found that the rate of flapper malfunction increased with decreasing flapper size and power line diameter. Further, the flapper malfunction rate increased as the distance between poles increased. The cost of replacing malfunctioning BFDs is very high as there are serious health and safety constraints related to working with live wires. Factors affecting diverter malfunctioning need to be considered for future powerline projects and our information can serve as basis for developing national standards or regulations for powerline mitigation in Mongolia.

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Introduction

The Oyu Tolgoi (OT) project, one of the world's largest copper and gold mines, is located in Khanbogd soum in Umnugobi province of Mongolia. In 2012, OT constructed a 96 km 220 kV power transmission line between the OT mine site and the Gashuun Sukhait (GS) check point at the Mongolia-China border. OT has also constructed a 35.5 km 35 kV transmission

line from the mine site to Khanbogd town, a 68 km 35 kV line to the borefield at Gunii Hooloi (GH), shorter 35 kV lines within the mine site (LA), and 6.3 kV distribution lines to individual production bores (PB) (Figure 1).

OT has a specific aim to achieve a Net Positive Impact on key biodiversity features in the Southern Gobi region, notably the