

مندوق محمد بن زايد للمحافظة على الطيور الجارحة
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RAPTOR CONSERVATION FUND



Saving raptors in Mongolia: country-scale retrofitting of insulation to reduce avian electrocution at power lines

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Dangerous Design Causes Electrocution Problem at low-medium voltage **distribution** lines



Steel-reinforced Concrete
Poles



Galvanized steel supports



Upright pin-insulators

CASE STUDY **Electrocution in**

Mongolia

Dangerous electricity distribution infrastructure

Cheapest construction design

- Expansion of regional **distribution network**, improve extent and reliability of supply,
- Industrial development, especially **mining**, requires energy and new distribution infrastructure
- Tourism development, especially **tourist camps**, requires energy and new distribution infrastructure

More than 30,000 dangerous poles currently in Mongolia



Dangerous lines can electrocute hundreds of raptors each month

CASE STUDY **Electrocution in Mongolia**

Scale of the problem

Estimated 18,000 raptors electrocuted annually

- Electrocution kills many raptors, including **resident** and **migratory** species
- Around **4,000 Saker Falcons** are electrocuted in Mongolia each year
- Steppe Eagles are another Endangered species electrocuted in large numbers
- Surveys have recorded **18 different species** of raptors electrocuted in Mongolia



The Saker Falcon is globally Endangered

CASE STUDY **Electrocution in**

Mongolia

Dangerous electricity distribution infrastructure

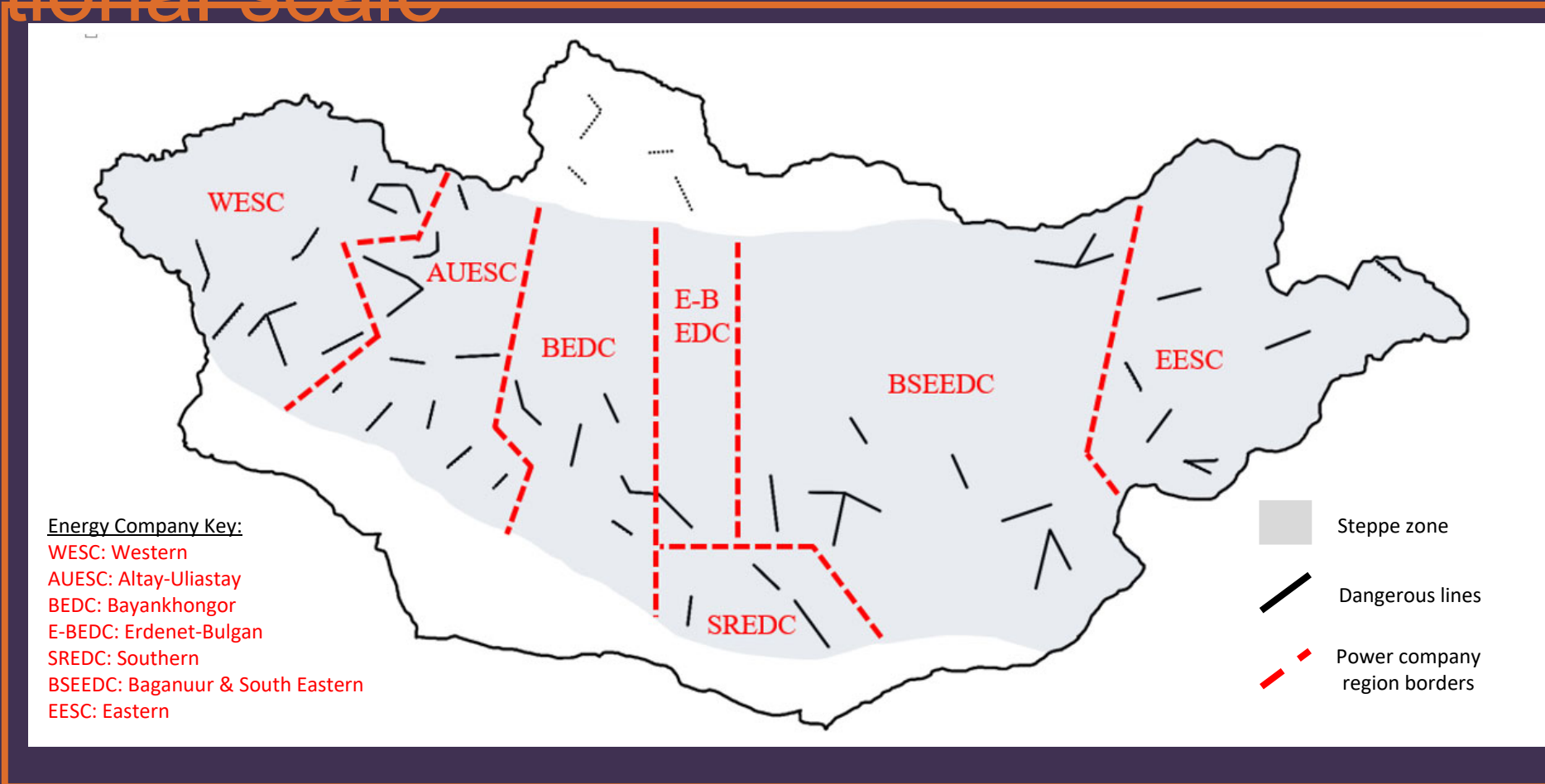
Location increases risk

- Power lines in **open, featureless landscapes** are the most dangerous
- Areas with high densities of prey, **mainly rodents**, attract large numbers of raptors
- Electrocution rates are highest where **high rodent densities** and **distribution lines coincide**



Electrocution rates are highest in late summer and autumn

Mongolian initiative to provide exemplar project at national scale



Mitigate dangerous poles in Mongolian steppe zone, ca. 30000 poles

Avian Electrocution

Trials to test efficacy of remediation and mitigation methods



Perch
Deflectors:
uninsulated

Most frequently used by EDCs in Mongolia
NO EFFECT



Perch
Deflectors:
insulated

Reduced electrocution rate by 85%



Perch
Deterrents

Reduced electrocution rate but easily broken



Insulation:
on cables

Reduced electrocution but potential risk to cable



Insulation:
on supports

Reduced electrocution rates and failsafe



Suspended
Insulators

Reduced electrocution but there are logistical constraints

Avian Electrocutation

Resolving the problem in Mongolia

- Designed and produced cover-up insulation for existing poles to reduce electrocution risk: **mitigation**

Specific designs for pole types in Mongolia: **pole-top and crossarm covers**

- **Effective**
- **Durable**
- **No impact on supply**
- **Failsafe**
- **Simple & Quick installation**
- **Low cost**



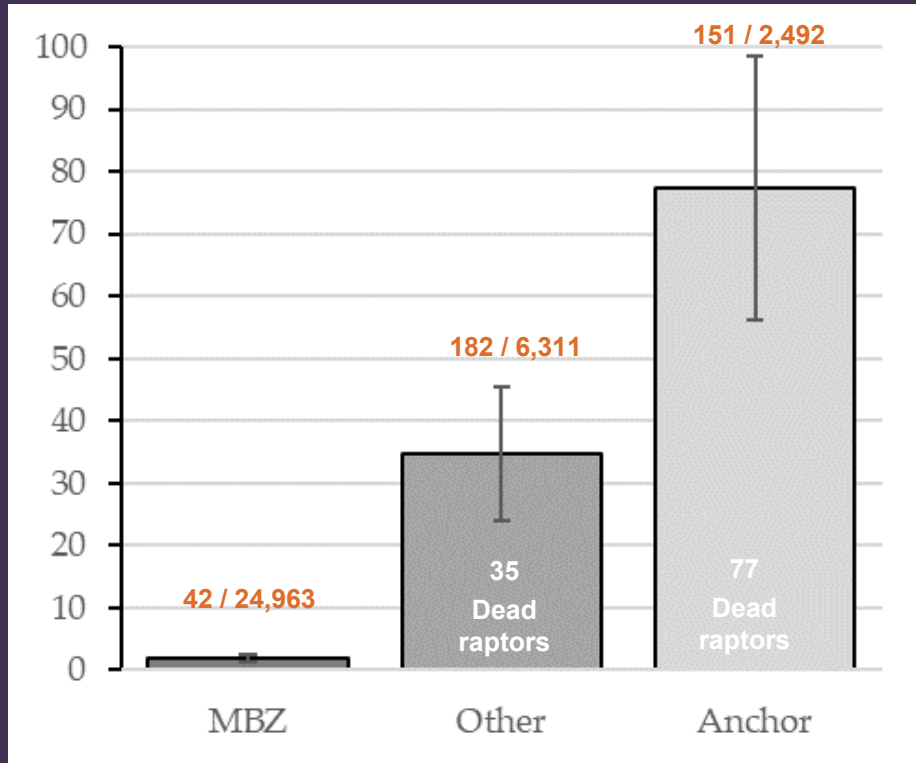
Mohamed Bin Zayed Raptor Conservation Fund Initiative

From 2019 to 2022 installed mitigation at ca. 27,000 poles across the Mongolian steppe



69 lines across six different electricity distribution company regions (ca. 80% of dangerous lines)

Reduction of electrocution risk

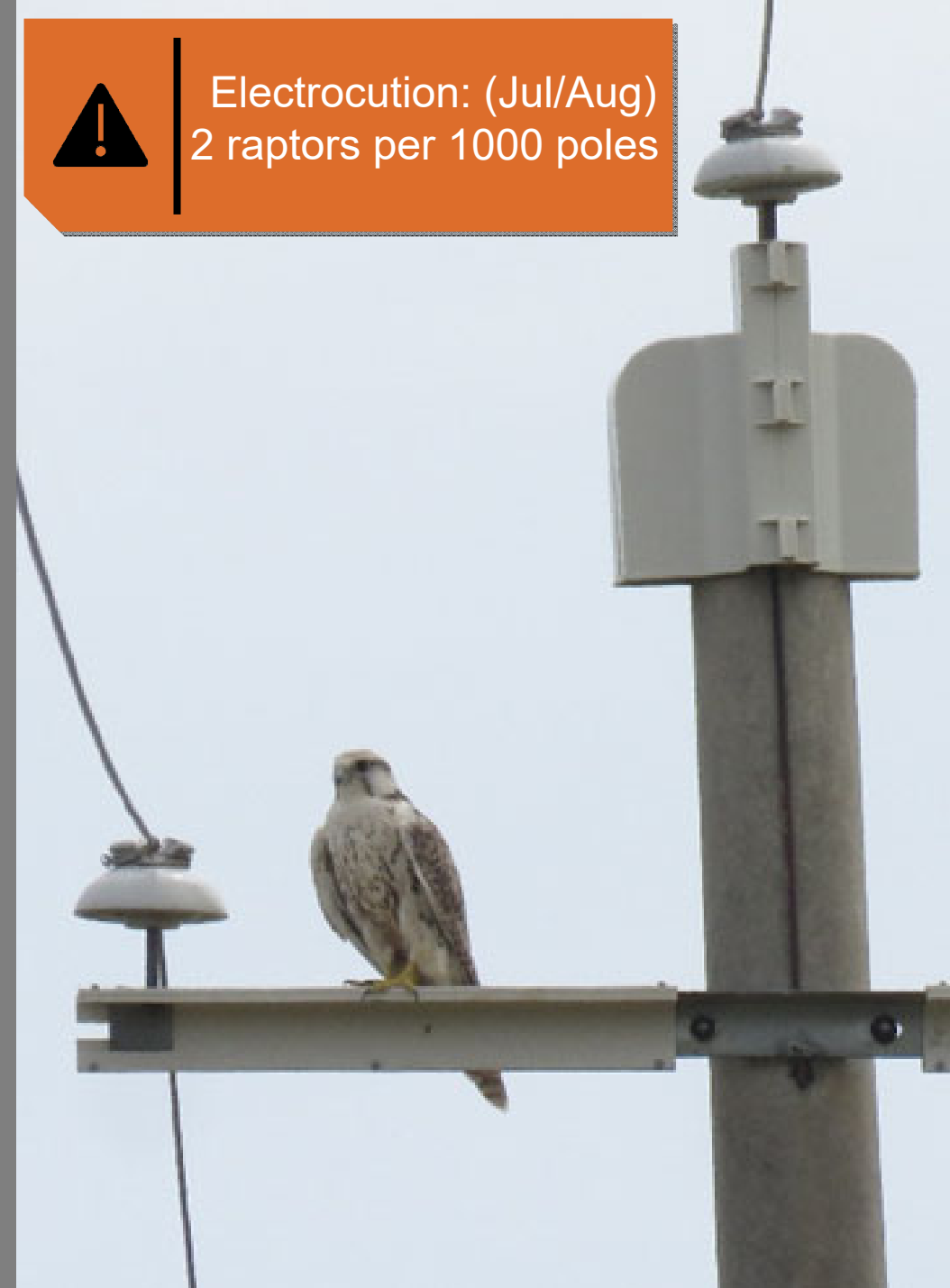


Raptor electrocution rate per 1000 poles

Electrocution over ca. 4-6 weeks
(July/Aug)



Electrocution: (Jul/Aug)
2 raptors per 1000 poles



Durability & cost

Durability: **ca. 4 years – no loss** (492 pole top / 295 crossarm)
1-3 years

Crossarm covers: ca. 1 in 5000 lost

Pole-top covers: ca. 1 in 10000 lost

Cost: **Mitigate 27,000 poles**
Equipment manufacture: ca. 44 USD per pole
Transport costs: ca. 6 USD per pole
Implementation costs: ca. 15 USD per pole



Avian Electrocutation Mitigation by retrospective insulation

- Insulation easy to install on **existing lines**, long-lasting, inexpensive and effective at reducing electrocution risk
- Can incorporate insulation into **new build lines** with very little additional cost
- **Cost** is a major factor in decision making process when planning new lines
- **Challenge:** 'Mainstreaming' raptor safe power lines with key Mongolian stakeholders, so that new infrastructure is bird-safe – mitigation of anchor poles, new lines and remaining existing dangerous lines (estimated 6,000-7,000 poles)



THANK YOU FOR
YOUR ATTENTION