



ADDRESSING THE THREAT OF ELECTROCUTION IN MONGOLIA

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Electrocution on medium voltage lines in Mongolia



Overview of electrocution problem in Mongolia

- A very high rate of raptor electrocution documented in Mongolia. Estimated ~800-4000 saker falcons were killed annually.
- Electrocution problem is with mainly on 15kV medium voltage lines.
- Percentage of saker falcon mortality due to electrocution is higher than any other species, >50%.
- Problem is not local, it is a nation wide problem
- Lack of legal instruments to ensure the prevention of birds from faulty powerline design and construction
- The question is “How to fix over 4000 km long faulty 15 kV lines erected throughout Mongolia?”
- Cost to fix the national power grid will be very high for the government.

How we are addressing the electrocution threat

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1. Improve legal bird protection system
 2. Develop new powerline standard and guidelines
 3. Mitigate existing faulty lines
 4. Continue monitoring of electrocution
 5. Identify and prevent further risks and problems
 6. Increase awareness of the issue

How to address the electrocution threat?

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Actions taken

1. MET established a working group to develop national standards and guidelines for bird safe powerline structures
2. First national workshop on raptor electrocution was organized, and guideline to the government actions delivered
3. Nation wide public awareness activity and press conferences organized
4. Oyu Tolgoi funds a trail project on the effectiveness of an inexpensive and low maintenance mitigation method
5. Oyu Tolgoi provides a grant to further mitigate 5 high priority lines in 2018
6. Small scale mitigation projects conducted by IAF, MFA, and two energy distribution companies.
7. MBZRF pledges 1mln to tackle electrocution problem in Mongolia. Implementation is expected in 2019.
8. MBZRF starts a trail project on the effectiveness of remediation methods

First national workshop on avian electrocution risks



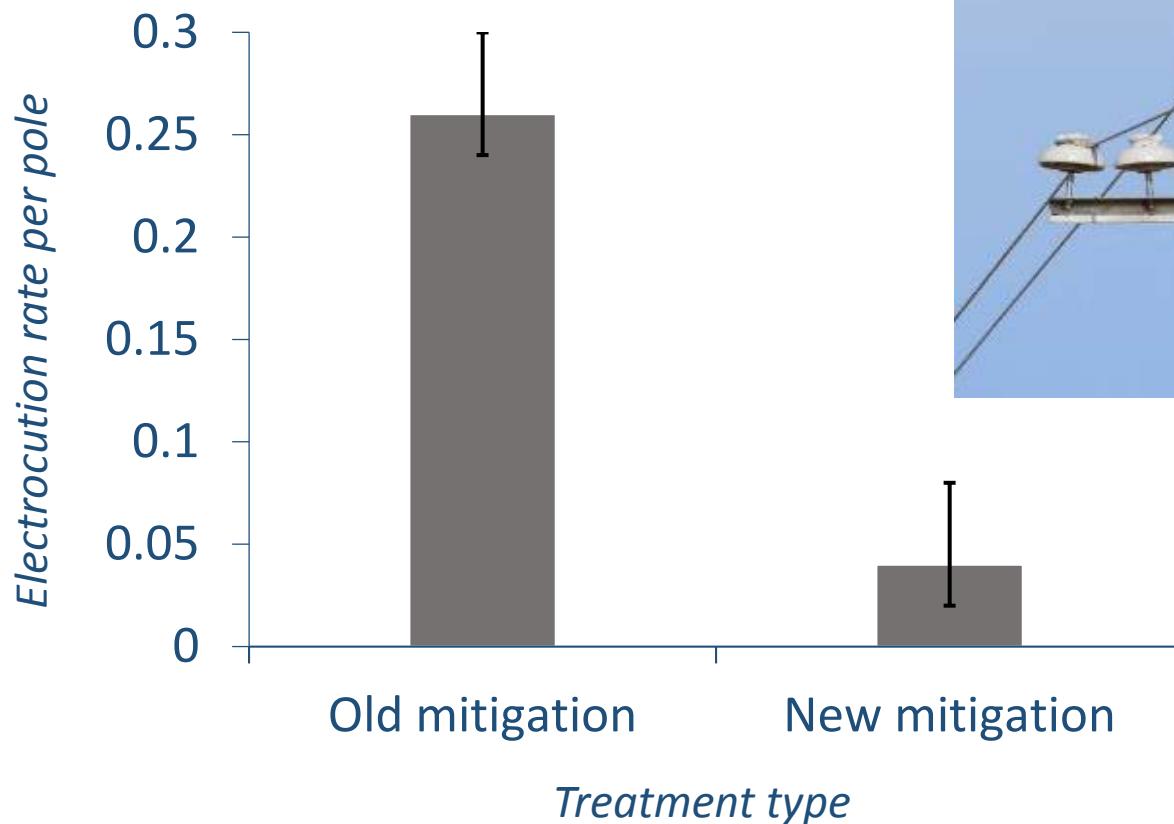
The first national workshop on avian electrocution risks was held in Ulaanbaatar on 14 March 2017.

Over 60 delegates from 34 organizations have participated. Biologists and engineers met for the first time.

Resolution with a list of urgent recommendations was adopted and submitted to the Mongolian Government and relevant agencies.



Trial project in 2016

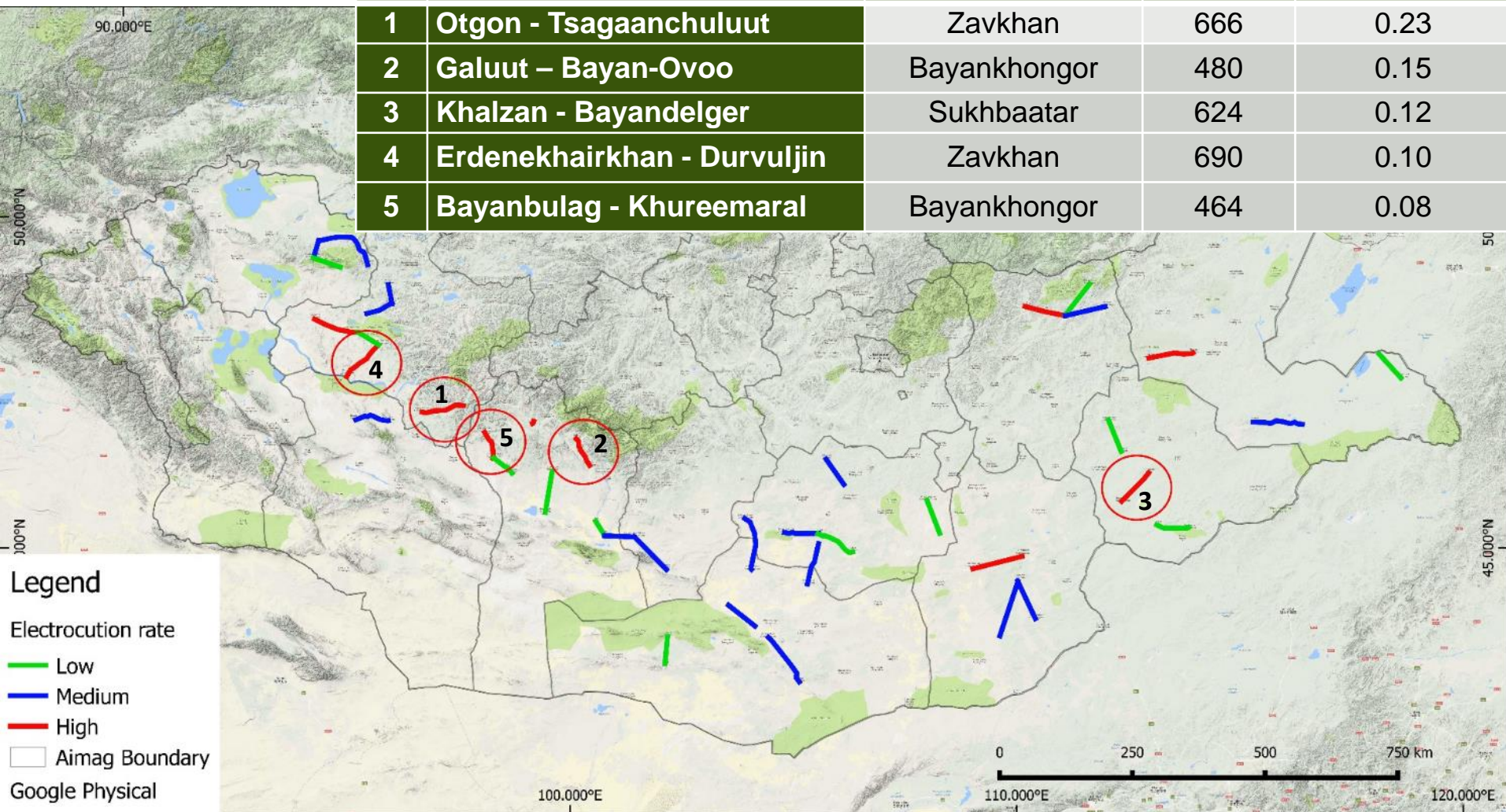


- Cheaper to install
- Low maintenance cost
- Reduced mortality significantly
- Did not eliminate the problem

**Mortality reduced by 74-97%
(mean 85%)**

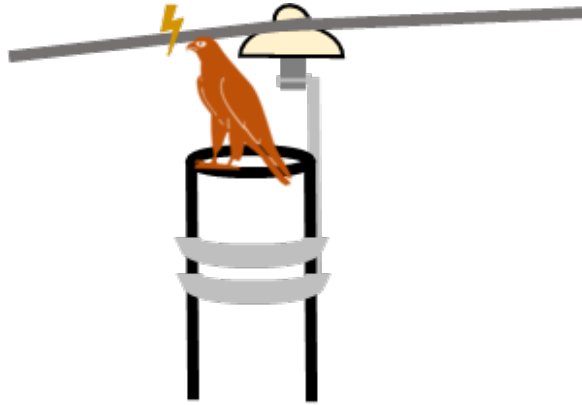
Update on powerline mitigation in 2018

#	Line name	Province	Number of poles	Electrocution rate per pole
1	Otgon - Tsagaanchuluut	Zavkhan	666	0.23
2	Galuut – Bayan-Ovoo	Bayankhongor	480	0.15
3	Khalzan - Bayandelger	Sukhbaatar	624	0.12
4	Erdenekhairkhan - Durvuljin	Zavkhan	690	0.10
5	Bayanbulag - Khureemarl	Bayankhongor	464	0.08



Mitigation method for phase-1 pole (li

Problem: the phase-1 conductor cable is curved and the steel brace fitted to the side of the concrete pole can be electrocuted when they contact the live

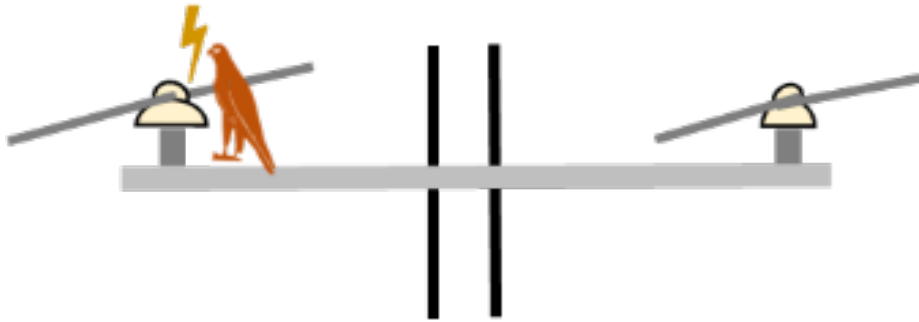


Solution: prevent birds from perching on the cable by replacing the existing steel brace by



Mitigation method for phase-2 and 3 conductor cables on the crossarm (line poles)

Problem: the phase-2 and 3 conductor cables are currently attached via pin-insulators connected to a steel crossarm fitted to the side of the concrete pole; birds that perch on top of the crossarm can be electrocuted when they contact the live conductor cable.



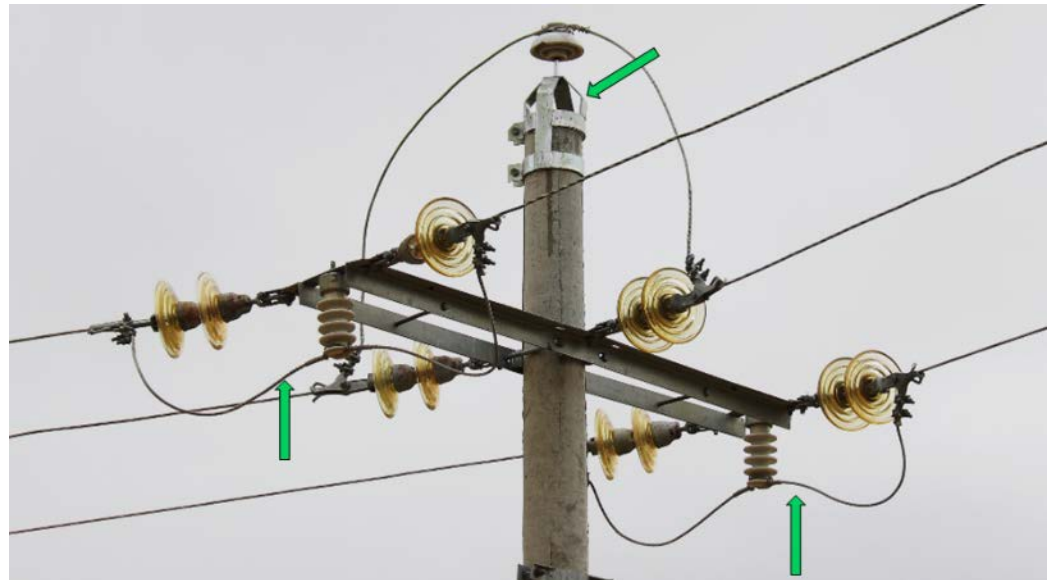
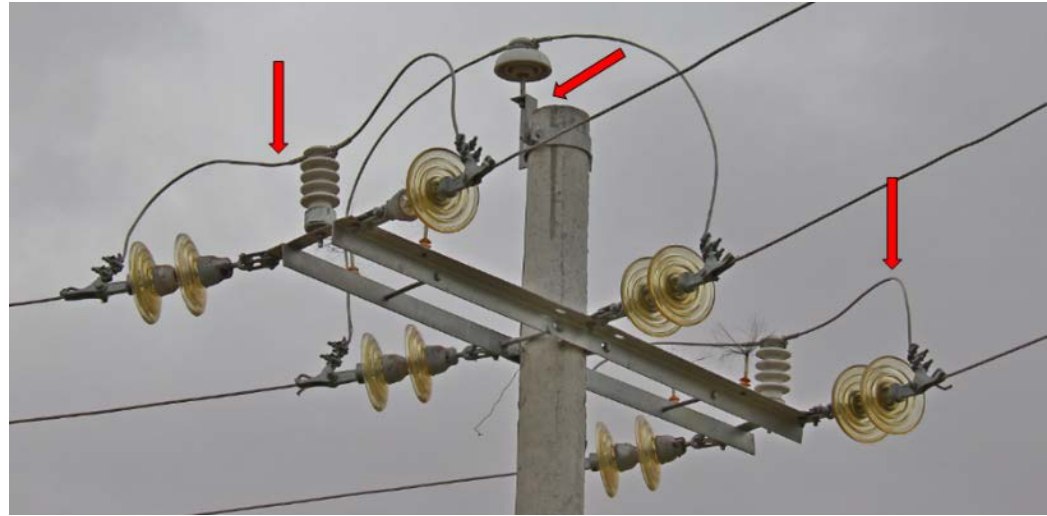
Solution: prevent birds that perch on the crossarm from contacting the phase-2 and 3 conductor cables by adding extra unconnected pin insulators next to the existing connected ones.



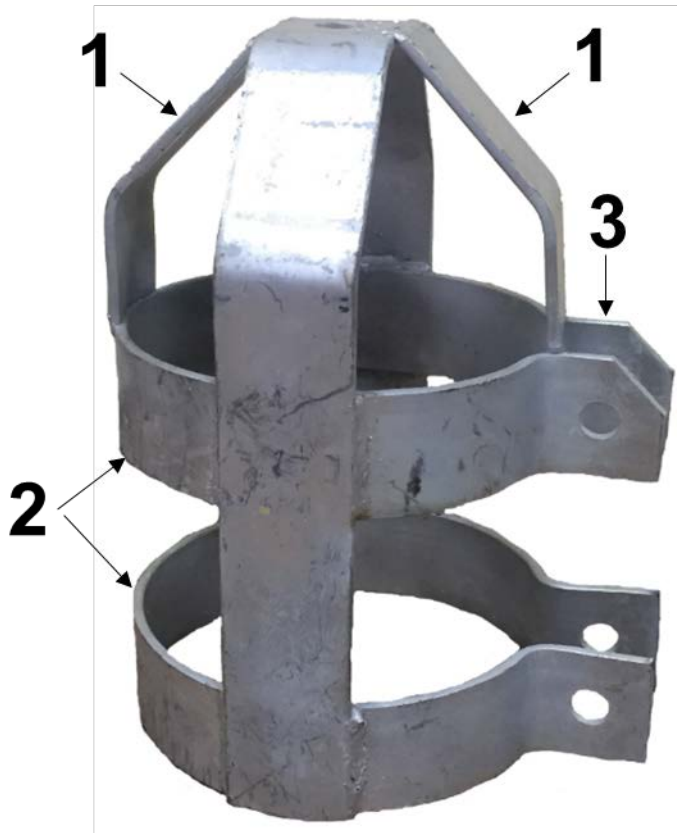
Mitigation method applied for anchor poles

Problem: the jump wire is currently attached via a pin-insulator connected to the crossarm (phases 2 & 3) or the top of the concrete pole (phase 1); birds can be electrocuted when they contact the jump wire when perched on the crossarm or top of the pole

Solution: prevent birds from contacting the phase-2 & 3 conductor cables by switching the jump wires to pass under the crossarm; prevent birds from perching on the pole top by replacing a steel brace by a cross mount at phase-1



Improvement changes made in solution for phase-1

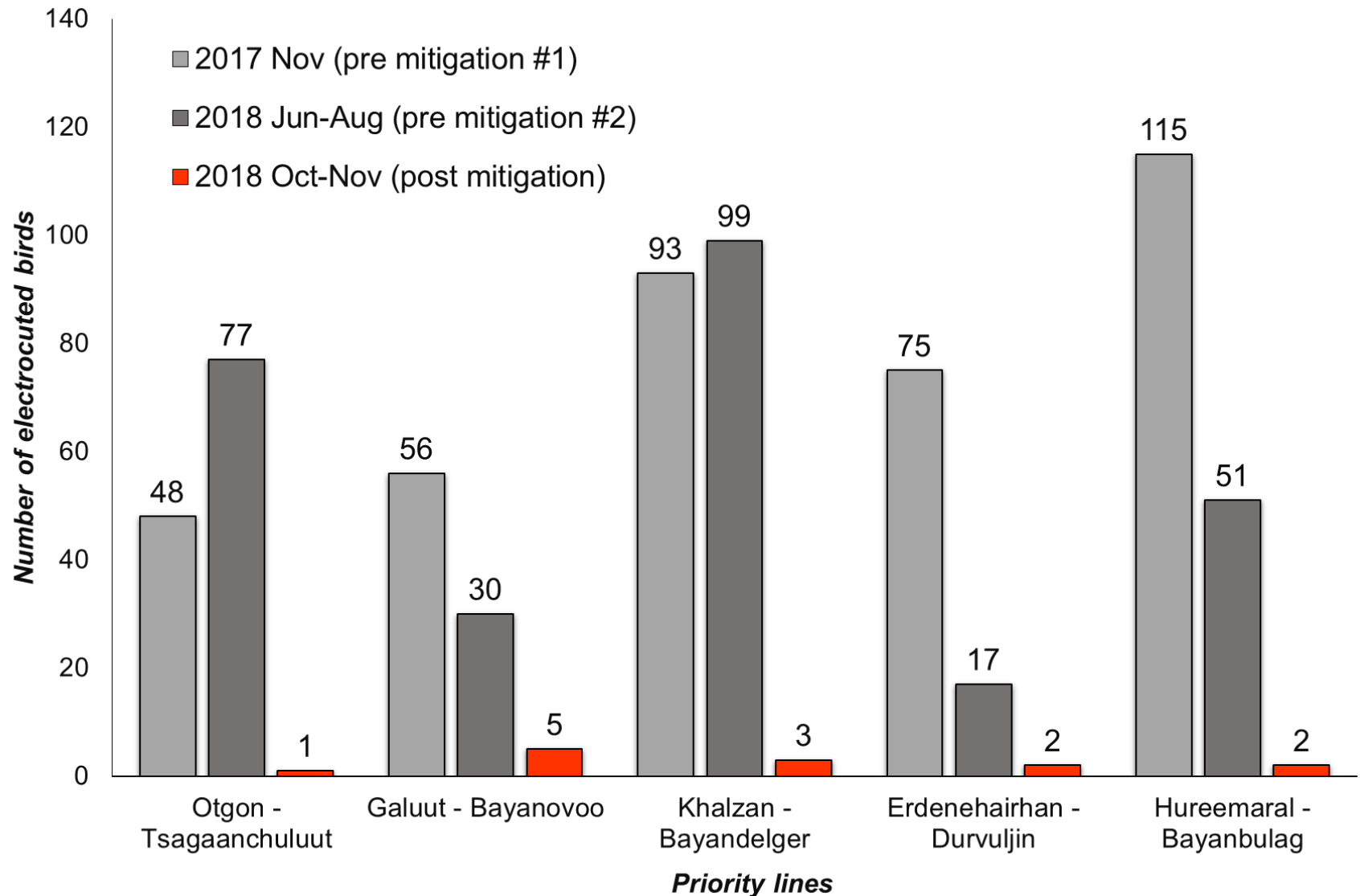


1. Changed the top of arch-shaped mount to cross-shaped mount to reduce risk of birds perching on the pole top and getting electrocuted. Not enough space left on the pole top for birds to perch.

2. Eliminated two bolt brackets on one side to reduce risk of birds perching on them and getting electrocuted.

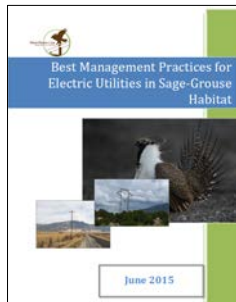
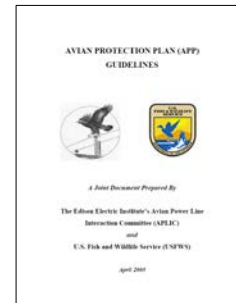
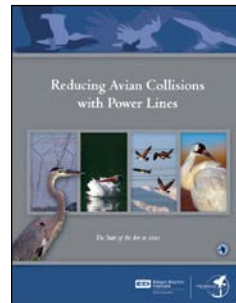
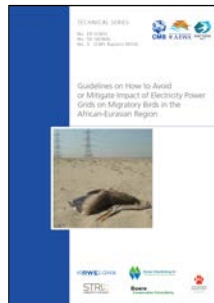
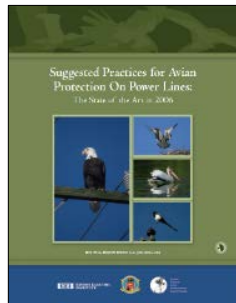
3. Retained two bolt brackets on the other side and cut the upper corner of the top bracket to reduce probability of birds perching on it and getting electrocuted.

Pre and post mitigation survey results



Develop new powerline standard and guidelines

A joint team from the Ministry of Energy, MET, and WSCC is developing national powerline standard and guidelines. It will be approved in early 2019.



International best practices and references

Plans for 2019

- National standard and guideline will be approved by the end of June 2019
- Continuation of existing powerline mitigation
- Expected start of the MBZRF supported project implementation in 2019.
- Nation wide survey on powerline collision will be organized in September 2019
- Mobile app for data collection and risk assessment will be developed and launched in May 2019
- Working meetings on electrocution issues

A question for discussion

There is an increasing documentation of raptor electrocution in Russia, Central Asian countries, and China.

**Do we need to organize a conference on
Avian electrocution and collision issues
in this region?**

Acknowledgment

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**MINISTRY OF ENVIRONMENT
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Thank you very much.



Questions!