Progress Report II
to
The Rufford Foundation

Caption for cover photo: A adult Saker Falcon incubates her eggs in the artificial nest on the wooden pole. Photo taken on 14th of May, 2021.

Brief information:

Project title:	The initial genetic investigation of Saker Falcon in Mongolia and its electrocution in southern Mongolia
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Project leader:	Onolragchaa Ganbold, PhD

The initial genetic investigation of Saker Falcon in Mongolia and its electrocution in southern Mongolia

1) Executive summary of the project

Saker falcon (*Falco cherrug*) is globally threatened bird, also known as national honored bird of Mongolia. Birdlife International categorizes this large falcon as endangered, due to rapid population decline, especially in central Asian breeding range (including Mongolia). Furthermore, its genetic characteristics in Asian population is also little known. Thus, we were aimed to conduct surveys for the electrocution of this species (with other raptors) in southern Mongolia, area where did not covered such survey, and to investigate genetic characteristics using samples from electrocuted birds (as tissue), and blood samples from live birds from historic nesting sites in Mongolia. With this study purpose, we conducted two electrocution surveys in southern and eastern Mongolia, and one class lesson for 7th grade middle school students in 2020.

2) Field surveys for Electrocution

As first field survey for 2021, we have conducted electrocution surveys in southern Mongolia, including Bayankhongor, Ovorkhangai, Omnogobi, and Dundgobi provinces (Fig. 1). These surveys were conducted between 13th and 19th of May, 2021. Due to Covid-19 pandemic, we were not able to conduct our surveys in April.

In Bayankhongor province, we have checked following 15kV electricity distribution lines, i.e. Bayankhongor-Bayan-Ovoo (Ba-Bo, 25km distance), Bumbugur-Baatsagaan (Bu-Ba 85km distance), Bogd-Baruunbayan-Ulaan-Bogd (Ovorkhangai province,Bo-Bo, 150km distance). In addition,15 kV distribution line that connected Mandal-Ovoo (Omnogobi) – Saikhan-Ovoo (Dundgobi) (Ma-Sa, 100km distance) was also checked (Fig. 1). Thus, we have conducted surveys along with a total of 360 km long 15kV electricity distribution lines in southern Mongolia. During surveys, we were drive a car at 40 km/h to detect carcasses along the lines as closer as we can. When we detect any carcass, we recorded GPS position, species name, carcass condition (by day), pole condition (with/without deflector, or deflector types).

From this survey, we found a total of 67 carcasses of 13 avian species. Of these, 62 were victims of electrocution, while remaining 5 were victims of wire collision (for more detail please see Table 1). The Globally threatened Saker falcon was recorded as the most frequently electrocuted species (with n=17 carcasses). Followed by Black kite (n=17), and Upland buzzard

(n=7). Great Cormorant (4 of 5 carcasses), Cinereous Vulture (2 of 3 carcasses), and Pallas's Sandgrouse (n=1) were recorded as victims of wire collision under 15kV distribution lines. For Saker falcon, we found the majority of these carcasses under 15kV distribution line (7 carcasses in only 24 km distance) between Bayankhongor and Bayan-Ovoo villages. While, relatively few (n=6) Saker falcon's carcasses were found between Bogd-BaruunbayanUlaan-Bogd 15kV distribution line (150 km distance). During our field surveys, we noticed that raptors (including Saker falcon) were more electrocuted in area where more grasses, in contrast raptors were less electrocuted in area with drought. Its might be resulted from abundance of their preys.

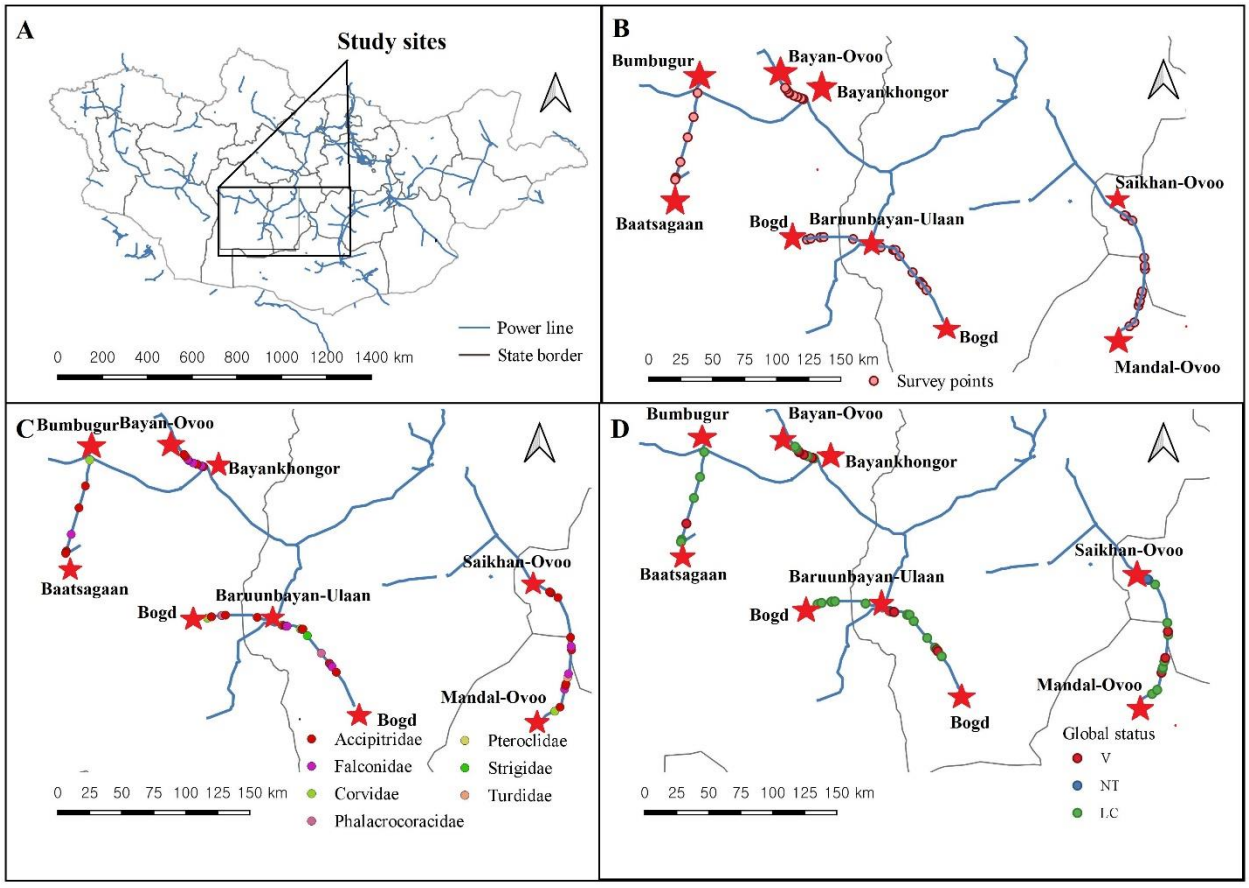

Figure 1. Electrocution surveys in southern Mongolia (provinces, Bayankhongor, Ovorkhangai, Omnogobi, and Dundgobi). A) Study sites, B) Maps of all detected electrocuted birds (see dots), C) Electrocuted birds by their types, D) Electrocuted birds by their status.

3) Genetic samples

Tissue samples were taken from all carcasses of Saker falcon and preserved in 70% ethanol for further experiments.

Table-1. Electrocuted birds' species from southern Mongolia

Common name	Scientific name	NEB	Freq.	Ba-Bo	Bu-Ba	Bo-Bo	Ma-Sa
Northern Goshawk	*Accipiter nisus*	1	1	-	-	1	-
Black kite	*Milvus migrans*	17	14	2	1	12	2
Cinereous Vulture	*Aegypius monachus*	3	3	-	-	1	2
Northern Long-eared Owl	*Asio otus*	1	1	-	-	1	-
White's Thrush	*Zoothera aurea*	1	1	-	-	-	1
Eagle sp	*NA*	1	1	-	-	1	-
Golden Eagle	*Aquila chrysaetos*	4	1	1	-	-	3
Great Cormorant	*Phalacrocorax carbo*	5	4	-	1	4	-
Carrion Crow	*Corvus corona*	3	1	-	-	-	3
Northern Raven	*Corvus corax*	4	4	-	1	3	-
Osprey	*Pandion haliaetus*	2	2	-	2	-	-
Pallas's Sandgrouse	*Syrrhaptes paradoxus*	1	1	-	-	-	1
Saker Falcon	*Falco cherrug*	17	17	7	1	6	3
Upland Buzzard	*Buteo hemilasius*	7	7	3	1	-	3
		67	**58**	**13**	**7**	**29**	**18**

NEF = Number of Electrocuted birds; Freq. = frequency; Ba-Bo =15kV line between Bayankhongor and Bayan-Ovoo; Bu-Ba = between Bumbugur and Baatsagaan; Bo-Bo = between Bogd-Baruunbayan-Ulaan-Bogd; Ma-Sa = between Mandal-Ovoo and Saikhan-Ovoo.

4) Further activities in 2021

In June, and late July-August, we will conduct field surveys for electrocution of Saker Falcon in several local regions in southern Mongolia. Also, we will check historic nesting sites of the target species in the Ikh Nart Nature Reserve, and artificial nests that constructed by our department in Galshar steppe in eastern Mongolia for collecting genetic samples. In addition, our team will visit several rural schools for our workshops and lessons in September or October, 2021.

Figure 2. Saker falcon uses any electricity poles as its nesting sites. Which indicates the artificial nests still needed to construct in Mongolian steppe. Photo taken in 14th of May in Erdenesant village, Tov province.

Figure 3. A Saker Falcon nest on the wooden pole. Photo taken in 14th of May in Erdenesant village, Tov province.

Figure 4. 15 Kv electricity distribution line between Bayankhongor and Bayan-Ovoo Villages. Photo taken in 14th of May. Two carcasses of Black Kite. Team member Erdenetushig Purevee and Erdenekhuu B were also in the photo.

Figure 5. An example of electrocuted Saker Falcons.

Figure 6. An action of field work, in the photo: Team member Onolragchaa Ganbold,

Figure 7. Other victims of electrocution under 15kV line between Bayankhongor and Bayan-Ovoo villages; Black Kite

Figure 8. Perch deflector at the poles of 15kV line between Bayankhongor and Bayan-Ovoo villages. But all carcasses were found under poles with such deflector.

Figure 9. 15kV distribution line between Bumbugur and Baatsagaan villages

Figure 10. Saker falcon's carcass that found under 15kV between Bumbugur and Baatsagaan villages. Photo taken in 15th May, 2021.

Figure 11. Other victims of electrocution under 15kV between Bumbugur and Baatsagaan villages. Photo taken in 15th May, 2021.

Figure 12. 15kV distribution line between Bogd and Baruunbayanulaan-Bogd villages

Figure 13. Saker falcon's carcass at top of the pole. Also this photo illustrated the types of perch deflector, which was relatively smaller.

Figure 14. Electrocuted Black kites under same pole

Figure 15. 15kV distribution line between Mandal-Ovoo and Saikhan-Ovoo villages. Photo taken in 19th May, 2021.

Figure 16. One of the electrocuted Saker falcon under 15kV distribution line between Mandal-Ovoo and Saikhan-Ovoo villages

Figure 17. Electrocuted Saker falcon with dropped perch deflector. This kind of perch deflector is not efficient.

Figure 18. Some of fresh carcasses of Saker falcon for tissue sampling

Figure 19. Field sampling procedures