

# THE EASTERN STEPPE'S LIVING LANDSCAPE

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### ABSTRACT:

Mongolia, with a territory of 1.6 million square kilometers, lies at 42o-52o N between the boreal forests of Siberia and the Gobi desert, and spans the southernmost border of the permafrost and the northernmost deserts of Central Asia. The Eastern Steppe of Mongolia is perhaps the world's largest intact grassland ecosystem. Treeless flat plains, rolling hills and a surprising amount of important wetlands characterize the Eastern Steppe. The Eastern Steppe is home to one of the world's last great spectacles of migrating ungulates, the Mongolian gazelle (*Procapra gutturosa*), that was estimated in the 2005 at a population of 1.2 million based on surveys performed by the Wildlife Conservation Society. Numerous other unique mammals live on the steppe, and there are many rare or critically threatened birds, including six species of cranes (almost half the world's species). The Eastern Steppe is also one the most important habitats in eastern Asia for migratory birds. The WCS Living Landscapes Program strives to conserve the valuable biodiversity, ecosystem service, and functional integrity of large wild places, including the Eastern Steppe, through the implementation of a participatory, wildlife-based strategy for landscape conservation. This approach, called the Landscape Species Approach, is designed to identify and map the needs of a representative suite of focal species (e.g., the Mongolian gazelle), across both political and ecological borders. We also identify and map the human activities which have the largest impacts on the ecosystem. By overlaying the needs of species and human activities, we are able to identify key conflicts (e.g., livestock competing with gazelle) and prioritize conservation resources to help resolve them.

## 1. INTRODUCTION

The Landscape Species Approach (LSA) is a systematic, spatially-explicit approach to planning the conservation of species' populations and functioning ecosystems. The concept and original framework of the approach were initially conceived in 2000-2001 by staff of the Wildlife Conservation Society (WCS) and was developed for three main reasons. First, it was widely recognize that traditional conservation efforts focused solely on protected areas, while necessary, were insufficient to ensure the persistence of many species and ecosystem services, and that to do so, conservation needed to increasingly work in the lands surrounding protected areas, where human uses dominate (Sanderson et al. 2002). The LSA was envisioned as a way of planning and actualizing this "scaled-up" conservation. Second, it was recognized that conservation practitioners needed to be more transparent about their actions, to set clear and justifiable goals, to be more efficient with a limited set of resources, and to demonstrate their successes or explain their failures. The development of the LSA as a systematic, objective planning framework was seen as a way to ensure that practitioners, within and outside of WCS, could do these things. Finally, the approach was seen as a way of encouraging land use and development plans, especially outside of protected areas, to explicitly consider the needs of wildlife in addition to the needs of humans.

## 2. STUDY AREA

Eastern Steppe of Mongolia is 285,000 square kilometers area which includes the aimags (provinces) of Dornod (123,600 km<sup>2</sup>), Sukhbaatar (81,200 km<sup>2</sup>) and Khentii (80,300 km<sup>2</sup>).



Figure 1. Study Area

The goal of the Eastern Steppe Living Landscape project is to develop a management system for the Eastern Steppe that preserves its ecological integrity using a wildlife focused, proactive approach to landscape planning and implementation; and by synthesizing and disseminating lessons learned, promote its adoption.

## 3. METHOD

The Landscape Species Approach (LSA), developed by WCS' Living Landscapes Program, provides the systematic framework and practical tools needed to guide site-based conservation based on the needs of wildlife within large landscapes of human influence (Sanderson et al. 2002). The LSA encourages practitioners to perform steps common to most "Systematic Conservation Planning" frameworks, such as those outlined in Margules and Pressey 2000 or Groves et al. 2002, including setting goals and quantitative targets, selecting focal biodiversity features, evaluating the sufficiency of existing conservation areas, identifying new areas and actions, and implementation and monitoring. While Systematic Conservation Planning is a useful and general framework for

conservation at any spatial scale (e.g., global, continental, regional, etc.), the LSA is adapted for the “landscape scale”, the scale most relevant for on-the-ground, local conservation action that aims to work closely with human communities.

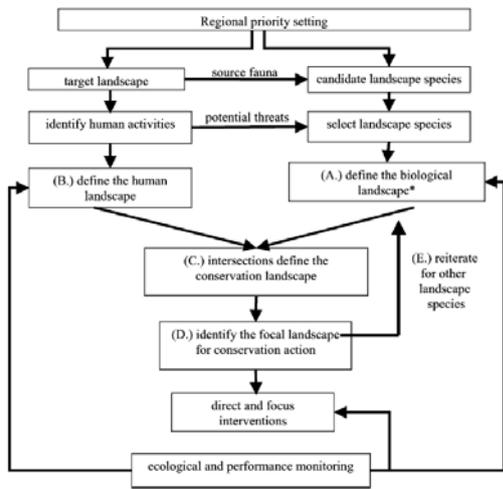


Figure 2. Flow chart summarizing the steps in implementing the landscape species approach

We envision the landscape scale as not an a priori defined, fixed-extent spatial scale, but one that emerges from careful consideration of the needs of biodiversity in the context of human resource use. To complete the LSA, interested practitioners proceed through the 10 planning steps outlined in Figure 2.

### 3.1 Select a suite of Landscape Species:

In the eastern Steppe, we identified a suite of eight Landscape Species that represent the threats to biodiversity and the diverse habitats of the Eastern Steppe landscape, including Mongolian Gazelle (*Procapra gutturosa*), Grey Wolf (*Canis lupus*), Eastern Moose (*Alces alces*), Siberian Marmot (*Marmota sibirica*), White-naped Crane (*Grus vipio*), Asiatic Grass Frog (*Rana chensinensis*), Saker Falcon (*Falco cherrug*) and Taimen (*Hucho taimen*).

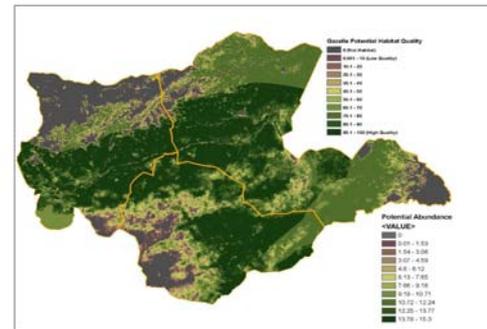
### 3.2 Define the biological landscape:

We mapped the potential distribution three of these species (Biological Landscapes) (Figure 3).

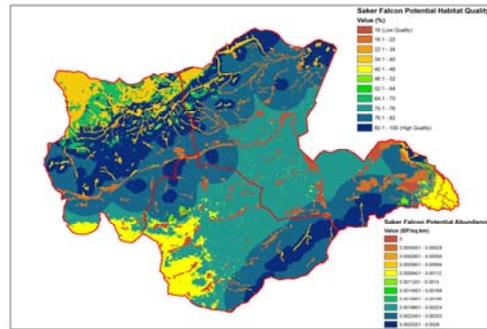
### 3.3 Define the human landscape:

Over-harvesting of wildlife is a serious threat to biodiversity conservation on the Eastern Steppe. Poaching for meat or skins is the most serious immediate issue facing marmots, corsac foxes, Pallas’ cats, wolves, and gazelles and over-harvesting is not limited to mammals. Buur Nuur (Lake), on the border with China, is experiencing uncontrolled fishing that threatens a number of species and the lake’s ecological integrity.

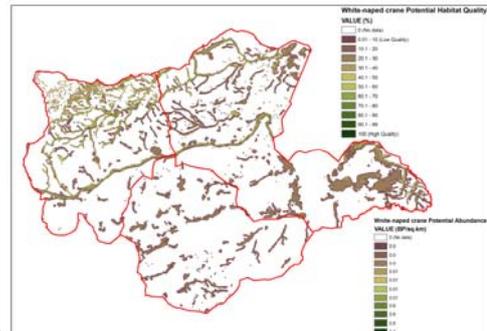
Nationally designated protected areas are under threat from illegal hunting, fishing, grazing, hay-cutting, and other activities that conflict with protected area objectives.



a)



b)



c)

Figure 3. Three species of Biological Landscape maps

- a) Mongolian Gazelle (*Procapra gutturosa*)
- b) Saker Falcon (*Falco cherrug*)
- c) White-naped Crane (*Grus vipio*)

Mineral and oil extraction, and the development of infrastructure to support the extractive industries have the potential to severely fragment the Eastern Steppe grasslands. Oil has been discovered (approximately 100 million barrels proven) in the Eastern Steppe and is currently exported by truck to China with the development of a pipeline and/or construction of a refinery in the region under discussion. There are also uranium, coal, and other mines.

Though pollution and scarring of the landscape is only local at present, these environmental impacts are likely to increase with creation of new roads. The government is planning a “Millennium Road” and railroad eastward through the steppes to link Mongolia to the Tumen River Area Development Project where China, Russia, and North Korea meet.

Livestock serve as persistent reservoirs for highly contagious and virulent diseases such as foot-and-mouth and livestock also compete with wildlife species for resources. We mapped the human activities which impact wildlife (Human Landscapes including livestock competition, hunting and poaching, human-mediated disease outbreaks, fire and mining) (Figure 4).

#### 4. RESULTS

By overlaying the Biological and Human Landscapes, we were able to create maps of the current distribution and Conservation Landscapes, which show where conservation could possibly have its biggest impact in terms of recovering populations of Landscape Species.

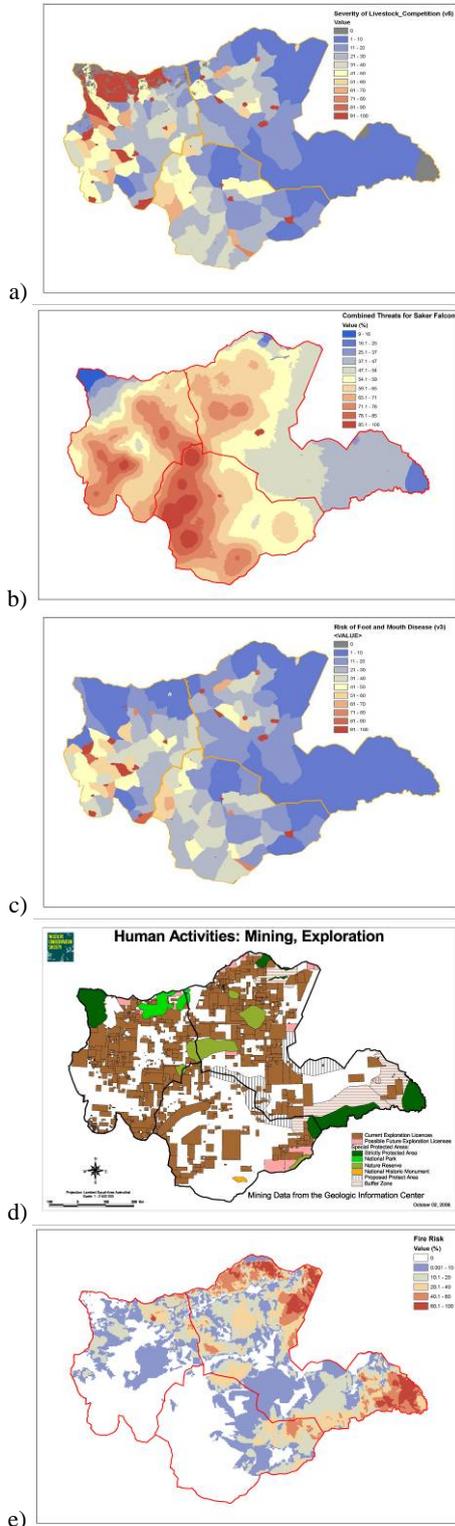


Figure 4. Human Landscape maps a) Livestock competition b) Hunting and poaching c) Disease outbreaks d) Mining e) Fire

In the Eastern Steppe Landscape WCS have established partnerships with government agencies, NGOs, and local groups whose interests and expertise complement those of WCS. Two examples include our work with the Eastern Mongolian Community Conservation Association to support livestock herder-led wildlife conservation and natural resource management and a project focused on wildlife law enforcement training which promotes collaborative wildlife protection among protected area staff, border guards and environmental inspectors in key regions of jurisdictional overlap (Figure 5).

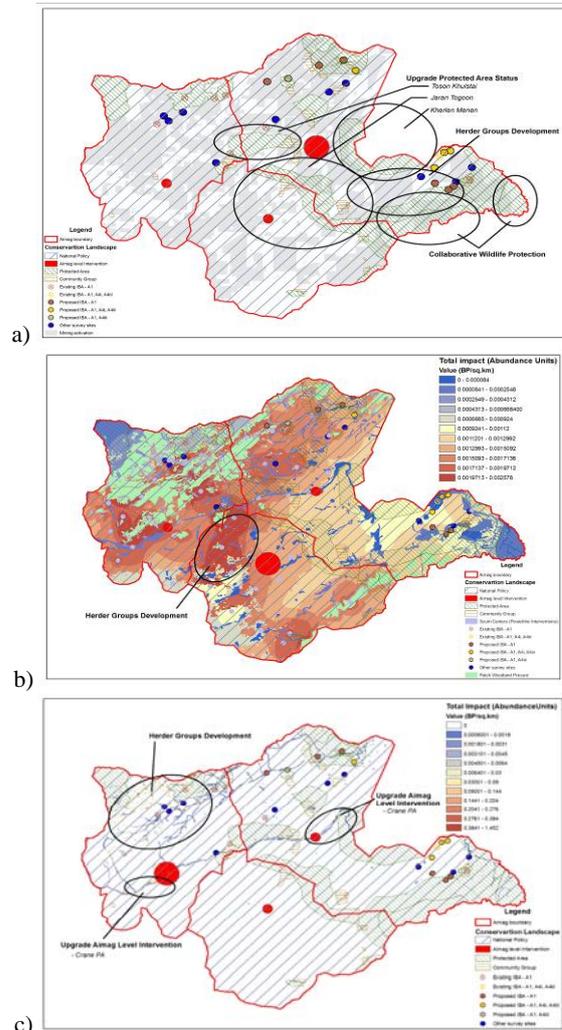


Figure 5. Three species of Conservation Landscape maps a) Mongolian Gazelle (*Procprca gutturosa*) b) Saker Falcon (*Falco cherrug*) c) White-naped Crane (*Grus vipio*)

#### 5. CONCLUSIONS

A monitoring framework for the Eastern Steppe will be established for key landscape species and specific human activities. The Mongolian gazelle population was last estimated at 1.2 million, a number which may represent an annual decline of 4 %. The country's economic needs are driving oil, coal, gas and mineral exploitation in the Eastern Steppe. As these deposits are exploited there is a need to monitor and work to reduce the negative impacts on wildlife populations and communities of nomadic pastoralists living in the area.

The Landscape Species Approach is designed to focus resources at points of critical importance with the potential for the greatest positive impacts on wildlife populations and biodiversity conservation. The approach takes humans needs and activities into account and directly addresses one of the greatest threats to the Eastern Steppe landscape which is poor planning and management by providing a spatially explicit plan of action for landscape level conservation.

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