Decline of Grey Wolves in Xinhaerhuyouqi and Ewenkeqi Districts, Northern Inner Mongolia

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Abstract: Grey wolves (*Canis lupus*) have probably decreased in number and distribution since the 1940s when it was widespread over Mongolian grassland. Also in Xinhaerhuyouqi (ca. 2,3000 sq.km), bordered by Mongolia and Russia, where wolves are still widespread over the whole area, they have prominently lowered the density, and in Ewenkeqi (ca. 19,000 sq.km), adjacent to Hailaier City with about 300 thousands of human population, wolves have been rapidly decreased in number since the 1960s and is restricted to a small area of the southeastern part of this district at present. It was originally caused by the policies of settlement and of increasing productivity of livestock industry that reswlted in growing human population and livestock and devastation of the grassland ecosystem, such as retrogression of plant community, increase of illegal harvest of wolves' main diet, Mongolian gazellel, and of legal kill of wolves, use of rodenticide including a heavy metal "Zn", land tenure toward private occupancy. The present policy on grassland development should urgently include nature conservation such as protection of wolves and other wildlife, establishment of nature reserves, regulation of livestock and human increases, public education on nature conservation.

Introduction

Grey wolves (*Canis lupus*) is widely distributed over different habitats in the northern hemisphere, semi desert to forest, and tropical to arctic regions (Stains, 1975). The Mongolian grassland covers a large area over Mongolia and Inner Mongolia, and it has been regarded as a thinly populated area with abundant wildlife including wolves. However, the present situation is different from the expectation; the grassland ecosystem has been rapidly devastated by increasing human and livestock populations (Zhou et al., 1995). Life style of people has also changed from nomadism to residential pastoralism mixed with nomadism. It could be

considered that wolves and wildlife have been prominently affected by those changes. Since wolves have been regarded as a competitor with human, they tend to be firstly excluded from ecosystem by nuisance control. However, there have been no informations on the history and status of grey wolves in Inner Mongolia.

In last year the authors started a cooperative study on ecology and protection of wolves in grassland ecosystem, Xinhaerhuyouqi and Ewenkeqi Districts, northern Inner Mongolia. This paper intends to summarize the status of wolves affected by the socio-economic changes of the grassland community regarding both human and wildlife.

Areas

The two study areas, Xinhaerhuyouqi and Ewenkeqi, are located in northern Inner Mongolia (Fig. 1).

Xinhaerhuyouqi covers an area of ca. 23,000 sq.km, bordered by Mongolia and Russia, and is located at a northeastern end of the Mongolian grassland. It ranges between 500 m and 1,100 m in elevation. The western half of the area is hilly, while the eastern half is flat, including Furing Lake. The annual precipitation is 300-400 mm. The snow is shallow. The human population is about 32,000, most of them oncentrate to Siqi and other ten and more hamlets. The nearest big city is Manshuri with around 100,000 inhabitants, close to the border of Russia.

Ewenkeqi covers an area of 19,000 sq.km, 100 km east from Xinhaerhuyouqi. The southeastern part is mountanious, the central is hilly, and the northwestern is flat. It ranges between 800 m and 1,700 m in elevation. The annual precipitation is about 270-320mm. The air teperature is 2.2-2.4 ℃ on average. The snow accumulation is 20-30cm on average, sometimes attains 60-70cm. The human population is ca.120,000. The nearest big city is Hairaru with ca.300,000 inhabitants.

Decline of Grey Wolves and Devastation of Grassland

1. The prestage of the social revolution before the 1940s

With progression of the social revolution of China, the human and livestock populations gradually increased, however, wolves were widespread over both districts, where the traditional

nomadism, accompanied by herds of horses, cattles, sheeps, and goats, and sometimes camels, still dominated. Ungulates, main prey of wolves, were also widely distributed along the national border. Wolves likely killed domestic animals as well as wildlife as prey. It is natural to consider that hunting pressure was not light on both species.

2. Retreating of the wild preys of wolves, 1940-1960

The human and livestock populations rapidly increased in both districts in this period.

In Ewenkeqi district, ungulates rapidly decreased in number and distribution. Mongolian gazelle (*Procapra gutturosa*) retreated to the national border of Mongolia and were exterminated by hunting. Cervids such as roe deer (*Capreolus capreolus*), red deer (*Cervus elaphus*) and moose (*Alces alces*) retreated to the montane area of Dashinanring Mountains with thin human population. Wolves likely increased the killing number of livestock instead of natural prey, and they were heavily controlled as a nuisance animal. Thus, wolves also began to decrease in number in this period. The grassland community likely retrogressed by grazing of livestock, and this probably resulted in increasing competition between livestock and wild ungulates for forages.

As well, in Xinhaeruhuyouqi, wolves were hated and killed by people, and thier density lowered, nevertheless they kept their range over the distrit. However, Mongolian gazelle began to retreat toward the national border where people were restricted to approach. Wolves which lost the main prey increased kill number of livestock, and this increased people's hate for wolves, much more.

3. Devastations of the grassland ecosystem, 1960-1980

In 1957, the Chinese government started a new policy, "Increment of high productivity of provisions" including crop cultivation and settlement of the nomadic people in Inner Mongolia. In the 1960s, the crop cultivation resulted partly in success and partly ended in failure, mainly dependent on amount of precipitation. Due to the settlement policy, many hamlets and villages appeared in the grassland. Consequently, Many nomadic people changed their life style from the traditonal nomadism to a residential pastoralism. Under this condition, grazing inevitably concentrated to the surrounding areas of hamlets and caused overgrazing. Overgrazing seriously impacted on the grassland. Grasse community became short in height and lost species diversity. Soil hardness increased. Unpalatable plant species increased in

number. People who still kept nomadism moved to far areas, avoiding the settlement areas, and they may cause another devastation of grassland. On the other hand, instead of nomadism, villagers harvested grasses and herbages by machines with engine in remote grasslands and carried them by tracks to residential places where they had never accessed. Those lands were left for wildlife in the past.

Both in Ewenqeki and Xinghaeruhuyouqi, the shortened grasslands of several centimeters in height provided favorable habitat condition to rodents, and next, rodents heavily damaged grasslands. For controlling the rodents, use of rodenticide started from 1970. Villagers put grains of rodenticide into nest holes of rodents every year. Since this rodenticide included a heavy metal "Zn", it may have secondary negative effect on various carnivores. This rodenticide had been used in 25 years until 1994. Marmot (*Marmota bobac*)was also controlled because it carries the pathogene of epidemic disease "cholera". This also might decrease wolves' diet.

In Ewenqeki, cervids such as red deer, moose and roe deer, which were heavily hunted, retreated to a montane area of Daxinganring and are endangered at present. Thus, wolves which lost their natural main preys likely increased to kill livestock. The local government started the wolf extermination campaign with a bounty system. Because of this campaign, wolves disappeared in the western half of Ewenqeki in the 1980s and was restricted to a southeast part of Ewenkeqi with thin human population in 1990s. In recent years, we heard of about 300 sheeps killed by wolves every year and of no wolves killed because of a small number of wolves surviving.

In 1974, the Academy of Science of Beijin pointed out a situation of overgrazing over Inner Mongolia. In both Ewenqeki and Xinghaeruhuyouqi, the local governments started to construct many exclosures for recovering grasslands by excluding wildlife. The exclosures probably resuted in taking habitat away from big wild mammals such as ungulates and wolves, and the exclosures probably avoided traditional nomadic people as well.

In Xinghaeruhuyouqi, although Mongoliian gazelle retreated to the area along the national border by overharvest, wolves were still widespreaded over the area. However, the density of wolves decreased because of heavy nuisance control.

4. Final stage of wolf surviving, 1980-present

In Xinghaeruhuyouqi and Ewenkeqi, human and livestock populations have increased. Therefore, devastation of the grassland has further progressed. In Ewenkeqi, cervids and marmot almost disappeared during this period, and wolves retreated to a small area in a

southeastern part of the district with thin human population. Two species of foxes, *Vulpes vulpes* and *V. corsac*, and other carnivores also have decreased because of decrease of rodents.

In addition, a landuse right system was newly established in 1984; the grasslands were partly divided to small lots of 30-70 ha. Each village family occupied the use of each lot. Traditional nomadism has been excluded from these lands, covered by the right. In these lots, grass was harvested by harvest machine with engine and was carried by car to villages in August for feeding livestock especially in winter which were enclosed. In addition to this land tenure, in former time, it was impossible for nomadic people to take livestock to remote places far from waters, however at present there are no places unused by them because of using harvest machine with engine and car. It means that there are no natural grasslands left for wildlife. Another new social phenomenon, "herd in trust", appeared in this period; nomadic people take charge of livestock which are owned by other persons who may live in villages or cities. In the "herd in trust" system, nomadic people could hold far more livestock than before. Usually, they hold several ten to several hundred sheeps without the herd in this trust system, while they keep more than one thousand sheeps, sometimes more than 2,000. As the herd size increases, its impact on grassland would increase. In Xinghaeruhuyouqi, therefore, competition between livestock and herbivores such as Mongolian gazelle might become violent, and people slaughtered Mongolian gazelle for selling them in markets. Wolves which lost the main prey killed livestock much more, and it increased peoples' hatred toward wolves. Thus, wolves decreased in number and in density. In Ewenkeqi, wolves has been near extinct. Thus, we conclude that an exchange from natural ecosystem to human system is still in progress in Xinghaeruhuyouqi and was almost completed in Ewenkeqi.

Proposition; to Save Grey Wolves and Grasslands

To save wolves and the grassland ecosystem in northern Inner Mongolia, the followings would be necessary:

1) Public education in nature conservation: People in the grassland have had no idea to protect nature and wildlife. If wildlife had some economic value, it has been harvested even if it was designated in law as a protection animal, while if it had no value, it has been left. Harmful one has been controlled. Thus, the animals have been traditionally regarded as natural resources, and some of them have been slaughted. It is urgent that people should be educated in significance and necessity of conserving wildlife, based on ecology. To construct a museum of natural hisotory on the grassland ecosysytem and its wise use may be one of the

ideas to promote public eduaction.

2) To establish nature reserves: The grassland has no topographical barrier to development by human as far as water is available. Before, the lands in deficiency of water could not be used for nomadic grazing and was left for wildlife, however at present, people can use almost all of those lands by harvesting grass by harvest machine with engine and car in a short period in summer and can develop them as permanent pastures by digging deep wells for supplying water. To stop further development, to establish nature reserves which conserve the natural ecosystem of grassland and wildlife including wolves should be urgent.

3) Wealth: Wealth would be essential to develop every culture, especially both public education and culture of nature conservation with the other necessary factors (Maruyama, 1993). In both districts, it is not exception. However, people likely can not afford to conserve nature and wildlife. People used to hunt every wildlife if it has economic and market value. Thus, Mongolian gazelle has been heavily slaughtered and sold in market. People without economic surplus can not tolerate damages of livestock by wolves, and wolves have been killed as nuisance. To provide different chances to promote local economy is necessary, as well as to regulate increases of human and livestock. Regulation and decrease of populations of human and livestock connect to release the grassland ecosystem from heavy impact of livestock industry but also to increase each economic share to each person.

4) To spread the idea on sustainable use of the grassland ecosystem: With increasing human and livestock in number, overgrazing has appeared in whole area, but people never regulate number of livestock. To educate people in reasonably sustainable use of the grassland is urgent.

5) To make balance between sustainable development and nature conservation: Every industrial development and nature conservation are inevitably confronted especially in landuse. When a nature reserve is established, to resolve the confrontation problem should be devised. Here, we point out the importance of introduction of the UNESCO's idea of "Biosphere Reserve", and it should be discussed.

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