

Changes in the Distribution of Deer and Black Bears in Nagano Prefecture and Regulating Factors

Misao Hashimoto^{1*}

¹Graduate Student, University of Tsukuba, JSPS Research Fellow

It is remarkable that wild animals make frequent appearances in villages and cause damages to crops, wood plantations and humans in recent years. The agricultural damage caused by the wild animal in Japan in the 2010 year amounts to about 23,900 million yen, where 70 percent are due to deer, wild boar, and monkeys (MAFF 2010). Also, bears cause not only damage to crops and wood plantations but also to humans.

In Europe and America wildlife management which manages the number of individual wild animals and their habitats has progressed to maintain hunting sustainably. Wildlife management has three elements, namely population management, habitat management, and consequence management. Wildlife management in Japan introduced the concepts of the European and American wildlife management. Also it is performed based on the wildlife aid-services plan of all prefectures according to the provisions of a country. It generally implements countermeasures to prevent wild animals from entering farmland or villages using expulsion or safety barriers. But currently no measures for the management of the environment are taken, such as maintenance of the environment of farmland and villages, and the environmental improvement of the wild animal's habitats. In order to evaluate the habitats of wild animals it is necessary to consider the relationship between changes in the habitat distribution and environmental changes on a long term time scale.

This is why this study intends to analyze the changes in the distribution of Deer and Black Bears in Nagano Prefecture and its regulating factors.

Chiba (1964) reveals that the depth of snow and an evergreen broadleaf forest are important environmental factors of habitats for deer and wild boar. In accordance with this result, this study also assumes that depth of snow and an evergreen broadleaf forest are impacting the habitats of deer and black bears. I used 5km grid data of the habitats of deer and black bears and a vegetation map on a scale of 1:50,000 for 1978 and 2003, obtained from the Biodiversity Center at the Ministry of the Environment. In addition, categories of vegetation are distributed by the degree of natural vegetation. I created GIS data of the snow depth in 1978 and 2002 from data by the Nagano local meteorological observatory.

The method of analysis was to overlay and create a cross table of the vegetation data and the snow depth data corresponding to each period on the basis of the habitats of deer and black bears for two years (1978 and 2003).

As a result, the habitats of deer and black bears in 2003 are larger than they were in 1978. Traditionally, the deer are said to restrict their habitation to places where the snow is more than knee-deep. But, in fact, the habitat region was expanded also to the area of 1 m or more depth of snow. This showed that it could not necessarily be said that the habitation region is prescribed by only the depth of snow. Furthermore, compared to the bears the deer inhabited more areas near artificial plantation and secondary woodland. This is influenced by the feeding habits of the deer. Moreover, the habitats of deer and black bears expanded more towards residential districts and crop lands. In response to the influence of an energy revolution and the import overseas material, the felling of firewood and building lumber has decreased. Since man stopped cutting down the forest, it has been expanded that the environment which a wild animal can inhabit.

This is why the changes of the habitats of deer and black bears are affected by the changing environment. Therefore, deer and black bears make frequent appearances in villages, and the damage caused by wild animals to agricultural land, wood plantations and humans has increased in recent years.

Reference

Chiba, T. 1964. Geographic distribution of wild boards and deer in the Japanese islands and their areal and quantitative fluctuations. *Geographical Review of Japan Ser.A*, 37, 575-592.

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