

Study on the Status of Bird Community in Mt. Namsan, Seoul

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ABSTRACT

This study was carried out from July to November 2004 in order to clarify the status of Mt. Namsan area as a wild life habitat and as a ecological green space in Seoul. During the surveys total 265 individuals of 34 species, 20 families, 5 orders were observed. The highest number of species and individuals of birds were found in November. Species diversity (H') and number of equally common species(e^H) of birds recorded in November were 2.57 and 13.12, which were higher than those in any other surveys. Over the whole period of the survey, great tit (*Parus major*) was the predominant species among the observed birds of which dominance was 22.26%. Only residents were observed as a high rank dominant species in July and October. However, siskin (*Carduelis spinus*), winter visitor, was recorded as a dominant species accounting to 11.22% in November. We observed chinese sparrowhawk (*Accipiter soloensis*), eurasian sparrowhawk (*Accipiter nisus*), common buzzard (*Buteo buteo*), and eurasian hobby (*Falco subbuteo*), which are the protected species by government. It shows that Mt. Nam and surrounding area could be important habitats for wild birds of urban area.

Key words : equally common species, Mt. Namsan, protected species, species diversity

INTRODUCTION

Rapid industrialization and urbanization has brought about huge changes in many ecosystems surroundings of a large city (Lee and Lhim, 1997). Natural environmental components have decreased in urban area with consistent civilization progress (Miller, 1997).

The cities in Korea usually have large population functioning as the center of industry, culture, and government, but a change in use of land through development has accompanied a low rate of a green tract of land. Therefore, while the people share in the benefits of industry, civilization, and information, they at the same time are being annoyed by polluted air and water, and noise pollution. However, man natively has intimate desire for nature hence, it is a tendency that their cravings for nature, who are living in pitiless and concrete circumstances, are increasingly rising (Lee, 1997).

Currently, within a urban forest area, a habitat of wild animals which is not influenced by human being's interruption is very rare, and it is also uncertain that the disturbance on the habitat would decrease. So the protection of the wild animal's habitat and constructive management are required (Cho, 1996). In addition, huge changes in wild animal's habitat by artificial interference of human being, and in the pattern of

environmental use occur an obstacle to the habitat, so management is urgently needed. Finally, maintaining some specific area as a habitat has an enormous significance, which guarantees health maintenance of the wild animals and ecosystem as well as wild animals' inhabitation and increase of their value (Lhim, 1997).

This study was investigated the status of Mt. Namsan area for the wild life habitat in a ecological green space of Seoul. Based on the result of this study, a few suggestion to conserve Mt. Namsan area for a sound ecological space in urban area will be given.

METHOD

Mt. Namsan is located latitudinally from N 39°32' 07" to 37°33' 21" and longitudinally from E 126°58' 53" to 127°00' 21". Based on the administrative boundary, Mt Nam over Jung-gu and Yongsan-gu, include 10 subdistricts: Hoehyeondong, Namsandong, Yejangdong, Pildong, Jangchungdong, Sindangdong, Huamdong, Yitaewondong, Yongsandong, and Hannamdong (Seoul city, 1992).

In an aspect of landscape, Mt. Namsan consists of forest (246ha, 82.9%), buildings (8.6%), park (6.0%), road (1.1%), and others (1.4%) (Seoul city, 1992).

Birds of Mt. Namsan and surrounding area were surveyed 3 times: July, October, and November 2004. For recording birds, line transect count were used along with point census method. Species of bird was identified and then the number of individuals was calculated through song and call of the each species, the naked eye, and binoculars (10×40, Nikon).

Taking the line transect count, the average speed 2 ha/ 100min of the birds was assumed to prevent duplicate counting. According to Won (1993), the birds were defined in scientific and Korean name.

RESULT

1. Observed Species and Individuals

During the surveys, total 265 individuals, of 34 species, of 20 families, and of 5 orders were observed. In July, we observed 71 individuals, of 19 species; in October, 66 individuals, of 16 species; in November, 128 individuals, of 22 species.

Sorted out through the seasonal migration, 19 species of the resident accounted for 55.88%; 7 species of the summer visitors were for 20.59%; 1 species of the passage migrant was for 2.94%; and 7 species of the winter visitors were for 20.59% (Table 1).

Mt. Nam and its surrounding area showed the highest proportion both of species and individuals in November. Over the surveys, a resident had the higher proportion in the number of species than migratory birds. However, in order to find with accurate results, additional investigation should be made during the breeding period of the summer visitors and the completely arrived period of the winter visitors.

The observed species obeyed all the times through all surveys was totally 8: Ring-necked Pheasant

(*Phasianus colchicus*), Rufous Turtle Dove (*Streptopelia orientalis*), Brown-eared Bulbul (*Hypsipetes amaurotis*), Long-tailed Tit (*Aegithalos caudatus*), Great Tit (*Parus major*), Varied Tit (*Parus varius*), Black-billed Magpie (*Pica pica*), and Carrion Crow (*Corvus corone*).

The species diversity (H') of birds recorded ranged 2.37 to 2.57 and the equally common species (e^H) ranged 10.73 to 13.12. H' was 2.37 in July; 2.16 in October; 2.57 in November. And e^H was 10.73 in July; 11.73 in October; 13.12 in November. Therefore, H' and e^H of birds recorded in November were higher than those in any other surveys during study periods.

2. Dominance

The dominant species among the observed birds was great tit (*Parus major*), which dominance was 22.26% of the dominance, followed by long-tailed tit (*Aegithalos caudatus*) (11.32%), yellow-throated bunting (*Emberiza elegans*) (8.68%), varied tit (*Parus varius*) (8.30%), and black-billed magpie (*Pica pica*) (7.55%) (Table 2).

As the dominance of the each survey was examined, great tit (*Parus major*) showed the highest dominance on every survey. Among the five highly ranked dominant species, great tit (*Parus major*) and long-tailed tit (*Aegithalos caudatus*) were included at all surveys. Only resident were observed as a high rank dominant species in July and October. However, in November, great tit (*Parus major*) and long-tailed tit (*Aegithalos caudatus*) accounted to 17.97% and 12.50% each as a dominant species with the winter visitor, siskin (*Carduelis spinus*), comprising 11.22% (Table 3).

3. Protected Species by Government

A few species protected by government were observed in Mt. Namsan and surrounding area. We confirmed one Chinese Sparrowhawk (*Accipiter soloensis*) in July and two Eurasian Sparrowhawks (*Accipiter nisus*) in November, both of which are protected as a natural monument. The Common Buzzard (*Buteo buteo*) and the Eurasian Sparrowhawk (*Accipiter nisus*), which are classified as the endangered species, were also observed in November and July. It shows that the study area of this paper could be an important habitat for birds of prey living in urban area.

DISCUSSION

Through 3 surveys, total 265 individuals of 34 species, 20 families, 5 orders were founded. In terms of seasonal variation, we observed the most number of individuals and species of birds in November: 128 individuals, of 22 species. The species diversity and equally common species were also higher in November than others. Lee *et al.* (1998) reported that the number of individuals and species of birds observed in Mt. Namsan were the highest in May, and the lowest in February and March. According to Holmes *et al.*

Table 1. The number of species and individuals monitored Mt. Namsan area

	Species	Mig.	July	Oct.	Nov.	Total
1	<i>Accipiter soloensis</i>	SV	1			1
2	<i>Accipiter nisus</i>	Res			2	2
3	<i>Buteo buteo</i>	WV			1	1
4	<i>Falco subbuteo</i>	SV	1			1
5	<i>Phasianus colchicus</i>	Res	4	2	3	9
6	<i>Streptopelia orientalis</i>	Res	7	8	1	16
7	<i>Dendrocopos major</i>	Res			1	1
8	<i>Picus canus</i>	Res			1	1
9	<i>Hypsipetes amaurotis</i>	Res	1	3	3	7
10	<i>Troglodytes troglodytes</i>	Res			1	1
11	<i>Prunella montanella</i>	WV			1	1
12	<i>Luscinia cyane</i>	SV	1			1
13	<i>Phoenicurus auroreus</i>	Res	1	3		4
14	<i>Turdus naumanni</i>	WV		1	2	3
15	<i>T. n. naumanni</i>	WV		2	9	11
16	<i>Urosphena squameiceps</i>	SV	1			1
17	<i>Phylloscopus borealis</i>	SV	1			1
18	<i>Phylloscopus coronatus</i>	SV	1			1
19	<i>Regulus regulus</i>	WV			1	1
20	<i>Muscicapa dauurica</i>	PM	1			1
21	<i>Paradoxornis webbianus</i>	Res	2			2
22	<i>Aegithalos caudatus</i>	Res	8	6	16	30
23	<i>Parus palustris</i>	Res		3	9	12
24	<i>Parus ater</i>	Res		1	6	7
25	<i>Parus major</i>	Res	21	15	23	59
26	<i>Parus varius</i>	Res	2	6	14	22
27	<i>Sitta europaea</i>	Res		1		1
28	<i>Certhia familiaris</i>	WV			1	1
29	<i>Emberiza elegans</i>	Res	7	4	12	23
30	<i>Carduelis spinus</i>	WV			15	15
31	<i>Oriolus chinensis</i>	SV	2			2
32	<i>Garrulus glandarius</i>	Res		1		1
33	<i>Pica pica</i>	Res	8	7	5	20
34	<i>Corvus corone</i>	Res	1	3	1	5
Number of species			19	16	22	34
Number of individuals			71	66	128	265

Mig. : migrant, Res : resident, SV : summer visitor, WV : winter visitor.

Table 2. The dominance of birds at the Mt. Namsan area

Species	Dominance(%)
<i>Parus major</i>	22.26
<i>Aegithalos caudatus</i>	11.32
<i>Emberiza elegans</i>	8.68
<i>Parus varius</i>	8.30
<i>Pica pica</i>	7.55
Other species	41.89
Total	100.0

Table 3. Percentages of individuals of 5 dominant species in each month

July		October		November	
Species	RD(%)	Species	RD(%)	Species	RD(%)
<i>Parus major</i>	29.58	<i>Parus major</i>	22.73	<i>Parus major</i>	17.97
<i>Pica pica</i>	11.27	<i>Streptopelia orientalis</i>	12.12	<i>Aegithalos caudatus</i>	12.50
<i>Aegithalos caudatus</i>	11.27	<i>Pica pica</i>	10.61	<i>Carduelis spinus</i>	11.72
<i>Streptopelia orientalis</i>	9.86	<i>Parus varius</i>	9.09	<i>Parus varius</i>	10.94
<i>Emberiza elegans</i>	9.86	<i>Aegithalos caudatus</i>	9.09	<i>Emberiza elegans</i>	9.38
Total	71.84		63.64		62.51

(1979), the biomass is high in May and a habitat is not varied due to the lack of cover of forest in February and March. Therefore, it is estimated that the number of individuals and species diversity are related to characteristic of each season.

According to the present survey, the resident occupied a larger proportion (55.88%) than summer visitors and winter visitors. In fact, this study was carried out only from July to November without breeding period of birds with rich biomass and whole winter. It is needed to carry out a long term survey for more information on status of birds community in Mt. Namsan area. Based on the further survey, it should be provided to proper management plan for wild birds seasonally living in Mt. Namsan area.

During surveys, great tit (*Parus major*) was predominant, and great tit (*Parus major*) and long-tailed tit (*Aegithalos caudatus*) were involved in 5 high rank dominant species observed from each survey. In November, siskin (*Carduelis spinus*), a winter visitor, was dominant next to great tit (*Parus major*) and long-tailed tit (*Aegithalos caudatus*).

The birds inhabiting in Mt. Namsan and its surrounding area get food and nest source from shrubbery, so that it was reported that shrubbery would effect greatly on the bird habitat (Kim *et al.*, 1996). Therefore,

the proper management on a path up a mountain, and forming shrubbery is desirable to be easy to get food and nest source for successful inhabitation.

Currently, Mt. Namsan and surrounding areas have become a habitat of wild cats and dogs. Wild cats and dogs became a natural enemy birds' nest in shrubbery within urban area. Therefore, their population should be limited by investigation of the density and thorough control on them. Furthermore, publicity activities is essential to provide residents with their pet cats and dogs (Lee *et al.*, 1998).

Considering that the rate of green space in Seoul is near or below the green minimum, and grassland cavity has been seen in the center of a city, it is believed that the ecological value of Mt. Namsan in Seoul is incredible (Seoul city, 1992; Kim *et al.*, 1996; Jeon, 1995). However, the study to conserve and maintain the ecological value of Mt. Namsan considering Mt. Namsan as a living, ecological space is scarcely conducted. Finally, the future study should be done to make Mt. Namsan function not as a space for a few living things which stands artificial interference, but as a ecological, and natural environment within a city for a diverse wild life.

REFERENCES

- Cho, K. H. 1996. Relationship between habitat structure and bird community of natural deciduous forest and planted coniferous forest in Kwangneung area. Seoul National University Master Thesis. p.60.
- Holmes, R. T., R. E. Bonney and S. W. Pacala. 1979. Guild structure of the Hubbard Brook bird community: A multivariate approach. *Ecology* 60: 512-520.
- Kim, J. H., B. C. Lee and Y. M. Lee. 1996. The comparative evaluation of plant diversity in forest ecosystem of Namsan and Kwangneung. *J. of Korean Forest Society* 85(4): 605-618.
- Kim, S. W, B. H. Yoo, W. S. Lee, C. Y. Park and K. H. Cho. 1996. Assessment and restoration of biodiversity in a degraded ecosystem. Korean Ministry of Environment. pp.163-242.
- Lee, W. S., K. H. Cho and S. J. Lhim. 1998. Status, Protection, and Management of Bird Community in Mt. Nam Area. *Korean J. Ecol.* 21: 665-673.
- Lee, W. S. and S. J. Lhim. 1998. Changes in bird communities due to urbanization. *Korean J. of Ornithology* 4: 47-54.
- Lhim, S. J. 1997. Changes in breeding bird communities and small mammal populations due to different habitat structures. Seoul National University Master Thesis. p.62.
- Miller, R. W. 1997. Urban forestry. Planning and managing urban greenspaces. (2nd ed.). Prentice Hall Inc., London. p.502.
- Won, P. O. 1993. Birds of Korea. Kyohak Co. p.461.

서울 남산의 조류 군집 현황

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요 약

서울에 위치한 남산에서 서식하는 조류의 현황을 통해 야생동물의 서식지로서 남산의 현황을 파악하고자 2004년 7월부터 11월까지 남산과 그 일대 지역을 조사하였다. 조사 기간동안 총 5목 20과 34종 265개체의 조류가 관찰되었으며, 11월에 13과 22종 128개체로 가장 많은 종수와 개체수를 나타내었다. 종다양도와 동등한 보편종수는 2.57과 13.12로 11월에 높게 나타났다. 조사 기간동안 박새 (*Parus major*)가 우점도 22.26%로 최우점종으로 관찰되었다. 조사 시기에 따른 우점종은 7월과 10월에는 모두 텃새만이 상위 우점종으로 관찰되었으나, 11월에는 겨울철새인 검은머리방울새 (*Carduelis spinus*)가 11.72%를 나타내며 우점하는 종으로 관찰되었다. 또한 천연기념물인 붉은배새매 (*Accipiter soloensis*)와 새매 (*Accipiter nisus*), 환경부지정 멸종위기종인 말뚝가리 (*Buteo buteo*)와 새홀리기 (*Falco subbuteo*)가 관찰되어 도심의 유일한 녹지공간인 남산이 야생조류의 중요한 서식지로 판단된다. 앞으로 보다 다양한 야생생물의 서식공간으로 창출하기 위한 남산의 보전·보호관리 방안이 마련되어야 할 것이다.

검색어: 남산, 동등한 보편종수, 보호종, 종다양도