Management and Conservation Strategies of Katano- kamoike, the smallest Ramsar site in Japan

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Management and Conservation Strategies of Katano - kamoike, the smallest Ramsar site in Japan

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Abstract - In Katano-kamoike designated as Special Protection Area as a Ramsar site, the population dynamics and foraging behavior of wintering ducks, Mallard and Baikal Teal were investigated by field observation and experiments. In population census of two ducks for 30 years, the number of Baikal Teal visiting Katano-kamoike has decreased recently. The population size of wintering ones had decreased until 20th. Especially it remarkably decreased from 1981. Also wintering population of Mallards at Katano-kamoike has been decreasing rapidly. Baikal Teal, Mallards and other dabbling ducks preferred rice fields with shallow water and artificial feeding of rice tussocks. By radio tracking census, it was observed that some ducks foraged at rice fields within 11 km from Katano-kamoike and the number of foraging ducks was negatively correlated with the area of rice fields with culverts.

I. Introduction

Migration of birds is one of special phenomenon in the study of animal population and behavior. In Japan, about 300 bird species appear to be migratory species moving in spring and autumn. The region from Noto Peninsula to Kaga in Ishikawa Prefecture of central Japan is one of important area for bird migration because it is located at the middle point on main route of bird migration along Japanese Sea [1]. Particularly many lakes and ponds located in this region are important sites for wintering of waterbirds, ducks and geese. Katano-kamoike is one of ponds located in Kaga. In every winter, more than 6,000 individuals of ducks or wild geese visit and stay here. We have conducted the research of wintering duck population in Katano-kamoike for 7 years. Especially we have investigated the population dynamics and the foraging behavior of two dominant wintering duck species, Mallard and Baikal Teal.

II. Study site and Materials

Katano-kamoike is pond and wetland with an area of about 1.5 ha, located in Katano in Kaga City, Ishikawa Prefecture. It is surrounded by hills with secondary mixed forest, composed of *Pinus densiflora* and *Quercus serrata*. In autumn and winter season from October to March, thousands of waterbirds visit and stay here. Particularly more than 2,000 of White-fronted geese winter here. In 1993, it was designated as Special Protection Zone of National Wildlife Protection Area, by the national government of Japan and done as a Ramsar site. At Katano-kamoike, Mallards have been a dominant species of ducks, and more than 5,000 individuals of Mallards are observed. Additionally many Baikal Teal, which is rare duck species in East Asia, is wintering here.

Mallard *Anas platyrhynchos* is a dabbling duck distributed throughout the Northern Hemisphere [2]. This species is highly adaptable and can be found on every kind of wetland. Mallard is the most numerous ducks wintering in Japan, and Japanese wintering population recorded in Jan. 2001 was over 400,000. Baikal Teal *A. formosa* is also one of dabbling ducks, being distributed in Far East Asia [2]. The species breeds in the forest zone of north to northeast Siberia. Baikal Teal migrates mainly to Korea and West Japan. There appears to have been a dramatic decline in recent years due to overhunting and habitat destruction. IUCN (2000) and Ministry of Environment, Japan (2002) registered Baikal Teal as a threatened species (Vulnerable) in the world and Japan, respectively.

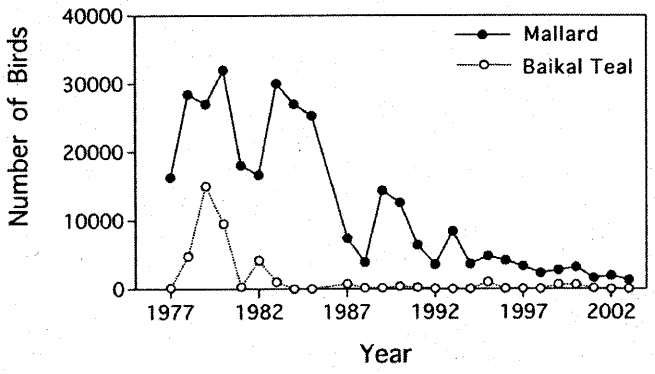

Fig. 1. Fluctuation of number of Baikal Teal and Mallard wintering in Katano-kamoike and in Japan, for 30 years. Data from the environmental agency of Japan.

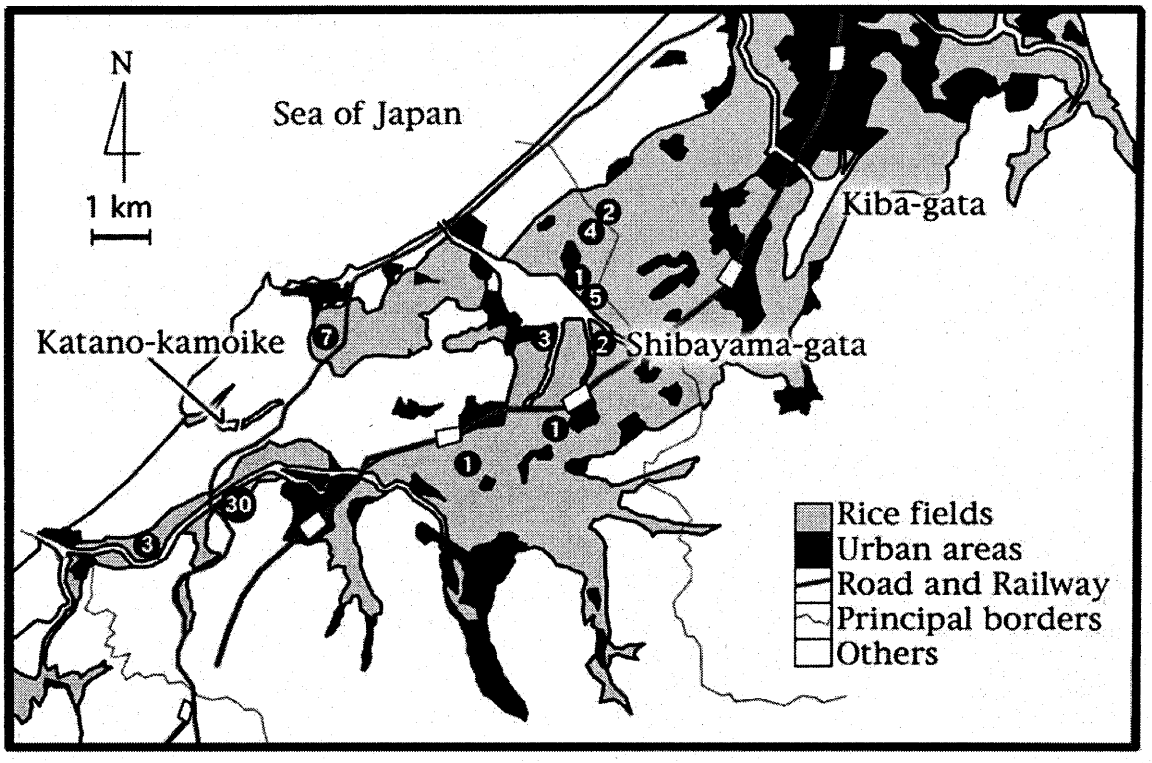

Fig. 3. Feeding points of ducks. Closed circles with number represent rice fields where Baikal Teal and Mallard were feeding. Large closed circle represents flooded rice fields with artificial feeding.

III. Results and Discussion

In 19th century, Baikal Teal was one of most popular dabbling ducks in anywhere of Japan. However at the present, Baikal Teal often visits and stays in lakes and ponds of sites along Sea of Japan, Ishikawa, Niigata and Fukui prefecture [3]. Particularly about 40 % of Baikal Teal wintering in Japan are visiting in Ishikawa prefecture [3]. Katano-kamoike and Kahokugata in this region are important wintering sites for Baikal Teal. However the number of Baikal Teal visiting Katano-kamoike have decreased recently (Fig. 1). The population size of wintering ones had decreased until 20th and especially it remarkably decreased from 1981. Also wintering population of Mallards at Katano-kamoike has been decreasing rapidly, but that of Japan is increasing.

As the factors, three hypotheses can be proposed: A) deterioration of feeding area for ducks, B) dispersion of wintering ducks, and C) Urbanization of Kaga city. From 1997, we have conducted some observation about the following three topics of research.

(1) Habitat selection of wintering ducks in agricultural landscapes. -effects of flooded rice field as feeding sites for wintering ducks.

(2) Feeding range of wintering ducks in agricultural landscapes.

(3) Estimation of the area of rice field required for feeding ground by ducks.

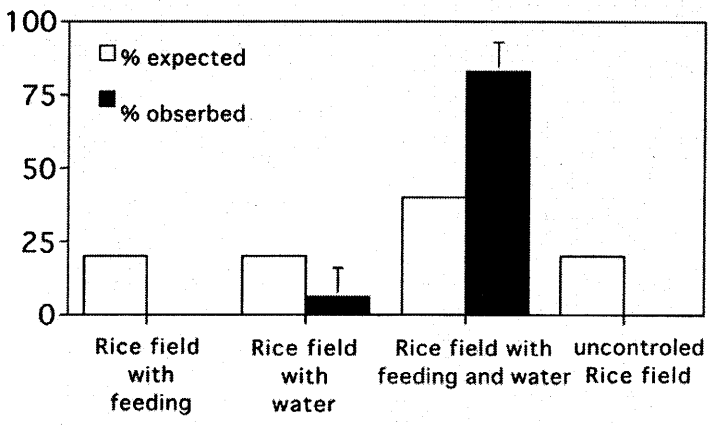

Fig. 2. Habitat selection of foraging duck in flooded and no flooded rice fields with or without artificial feeding. □ indicates the expected value estimated by considering the proportion of area. ■ and bar indicate means and standard deviations, respectively.

By field observation and census of foraging ducks, it was observed that Baikal Teal, Mallards and other dabbling duck species preferred rice fields with shallow water and artificial feeding of rice tussocks (Fig. 2). Radio tracking census revealed that some ducks foraged at rice fields within 11 km from Katano-kamoike (Fig. 3) and there was negative correlation between the number of foraging ducks and the area of rice fields with culverts ($P<0.0001$, $r^2=0.75$, Fig. 4).

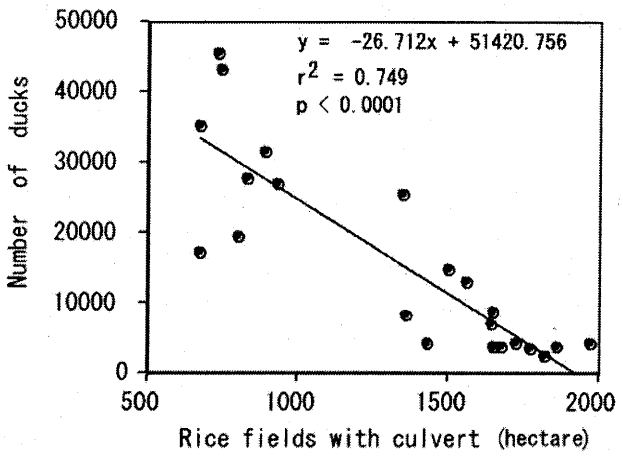

Fig. 4. Relationship between the number of foraging ducks and the area of rice fields with culverts.

By the data of foraging area, we estimated that Baikal Teal needs 0.15 x N_{BT} hectare of flooded rice fields for feeding ground in wintering season and Mallards 0.21 x N_M hectare, where, N_{BT} represents integration of the number of Baikal Teal wintering at Katano-kamoike from Nov. to Mar. and N_M represents that of Mallard. For the conservation of Baikal Teal, Mallards and other dabbling ducks, it is effective to make proposals to flood rice fields in feeding area with shallow water.

References

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