Population Dynamics and Wintering Status of Baikal Teals Anas formosa in Korea

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Abstract –Baikal Teals *Anas formosa* have increased over the past two decades from a few in the early 1980's to 350,000 individuals in the winter of 2000-2001 from the nationwide winter waterbird census in Korea. Comparison of survey data between 1984 and 2000 indicated a 70-fold increase in the number of Baikal Teals. The result indicates that the population has been increasing at ca 28% per annum since 1984. Baikal Teals regularly arrived at Seosan Reclamation Area about 160 km southwest of Seoul in the middle of October, and then spread out to other reservoirs during the mid-winter.

I. Introduction

The breeding and wintering range of Baikal Teals *Anas formosa* are restricted in East Asia and Siberia. The birds breed in high arctic of East Siberia in the summer. After breeding, they usually move to Korea, Japan and China for wintering. In some place, both breeding and wintering ground, the birds used to be very common species at the first half of 20th century according to the testify of local hunters in Siberia and written records in Korea and Japan [1, 2]. Until the 1940's, Baikal Teals were widely distributed in Korea where it was very abundant winter visitor. After that the birds were significantly decreased, and absolutely disappeared in the 1970's. Thus, Baikal Teals have been internationally protected as threatened species by BirdLife International [3].

II. Population Dynamics

The birds were reappeared in Korea with flocks of 5,000 in 1984, and then the population has explosively increased [4]. Thus, they have increased from a few in the early 1980's to 350,000 individuals in the winter of 2000-2001 from the nationwide winter waterbird census [5]. Comparison of survey data between 1984 and 2001 indicated a 70-fold increase in the number of Baikal Teal. The result indicates that the population has been increasing at ca 28% per annum since 1984. The continued exponential increase in bird numbers poses interesting ecological questions. This unusual population dynamic could not be explained as a result of habitat change, hunting pressure and available food in the wintering ground. Moreover, effective investigation of population trend dependent upon adequate population and productivity information from all portions of a species' breeding range, but productivity of Baikal Teal breeding in Siberia has not been assessed adequately.

III. Wintering Status in Korea

Economic booming in Korea resulted in destruction of alternative waterfowl habitat and urbanization of rural area. Thus, most of the waterfowl are concentrating at large artificial lakes originated tidal mudflat reclamation in the West Coast of Korea. Seosan Reclamation Area is one of the largest waterfowl wintering ground in which the largest numbers of waterfowl use this area.

Most of the world Baikal Teal populations are wintering in Korea Peninsular. Baikal teals regularly arrived at Seosan Reclamation Area about 160 km southwest of Seoul in the middle of October, and then spread out to other reservoirs during the mid-winter. During the northern migration in spring, the Baikal Teals left Korea at the end of March to their breeding ground. In Korea, the birds usually use many reclaimed reservoir. They make huge winter flock as many as 200,000 birds. They usually rest on the water at large freshwater lake during the daytime. After sunset, the birds move to nearby rice field and forage scattered rice grains, remained after harvesting.

IV. Outbreak of Avian Cholera

The population of Baikal Teals increased so fast and densely congregated at relatively small area that many ornithologists worried about the spread of epidemics among them. Indeed, the outbreak of avian cholera occurred at Seosan Reclamation Area in October 2000.

Avian cholera is a highly infectious disease caused by the bacterium *Pasteurella multocida*. This bacterium can kill waterbirds swiftly, sometimes in as little as 6-12 hours after infection [6]. Bacteria released into the environment by

dead and dying birds can subsequently infect healthy birds. As a result, avian cholera can spread quickly through a wetland, killing thousands of birds in a single outbreak. Outbreaks of avian cholera among wildbirds have been reported in Europe and North America, as well as in Asia.

The total numbers of dead birds reached 12,000 individuals. More than 11,000 Baikal Teal died during the outbreak, representing about 3% of the world population of Baikal Teal (Table I). Mallard and Pintail also died in large numbers, with mortality percentages of 5% and 4%, respectively. Despite the outbreak, the wintering population of Baikal Teals in Korean wetlands remained healthy, and their numbers reached another record high with 350,000 individuals being counted in the most recent winter of 2000-2001 (Fig. 1.).

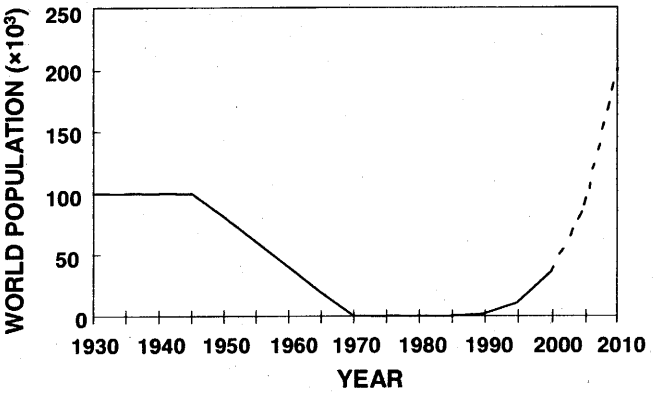

Fig. 1. Estimated and Expected Number of Baikal Teal Population from 1930 to 2010 in Korea.

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Table I

Retrieved dead birds by avian cholera and waterbird population during the outbreak at Seosan Reclamation Area.

Scientific Name	English Name	Dead Birds	Rate	Observed Population	Mortality
Anas formosa	Baikal Teal	11152	89.5%	170000	6.6%
Anas platyrhynchos	Mallard	581	4.7%	59100	1.0%
Anas acuta	Northern Pintail	542	4.3%	2570	21.1%
Anas crecca	Common Teal	80	0.6%	740	10.8%
Anser fabalis	Bean Goose	55	0.4%	20360	0.3%
Anas poecilorhyncha	Spot-billed Duck	41	0.3%	21800	0.2%
Anser albifrons	White-fronted Goose	4	<0.1%	625	
Fulica atra	Coot	2	<0.1%	25	
Ardea cinerea	Grey Heron	2	<0.1%	56	
Larus argentatus	Herring Gull	2	<0.1%	68	
Anas penelope	Eurasian Wigeon	1	<0.1%	0	
Larus ridibundus	Black-headed Gull	1	<0.1%	179	
Total (Affected Species)		12463		275523	4.5%
Other Waterbirds		0		1685	
Total		12463		277208	4.5%