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SURVEY ON BREEDING PAIRS OF THE SCALY-SIDED MERGANSER IN THE CHANGBAI MOUNTAINS, CHINA SPRING 2008

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Introduction

The Scaly-sided Merganser is recognized as a globally endangered species. The Changbai Mountain range (China side) is a key breeding ground of this bird. As lacking of recent studies and investigation, the current status of the Scaly-sided Merganser in this area is not much clear. For the conservation of this species, we need to carry out systemic surveys and monitoring programs on the breeding population in Changbai Mountains. Our project, **Survey of Scaly-sided Merganser (*Mergus squamatus*) Breeding Population and Migration in the Changbai Mountains, China**, supported by the Rufford Small Grants Foundation, is going to study the current status and provide basic data for further conservation to this bird in this area. We will estimate the population, investigate the distributive places and migration stop over sites, as well as find the threats of this bird in the Changbai Mountain range.

From Apr. 10 to 24, 2008, the survey on breeding pairs of the Scaly-sided Mergansers in the Changbai Mountains was made. As the sharply decreased snow melting in the Changbai Mountains in winter of 2007 and less rains in spring of 2008, 2/3 of rivers we surveyed were slow and calm. And this provided us a very good opportunity to taste the bland characteristic of wild rivers besides surge.

We are benefited from the guidance and help from Russian ornithologist, Dr. Diana Solovieva in methodology. With her guidance, we could make very careful preparation ahead of the field survey.

Content

Survey Area

In the Changbai Mountain range, the Scaly-sided Merganser is mainly distributed at lava mesa surrounded the Changbai Mountain volcano from north and west. In this area, all the tributaries flow into and converge to two big water systems, the Yalu river and Songhuajiang river. These mountainous rivers provide rich food resources to Scaly-sided Mergansers. Even most the virgin forests were logged, there were still some secondary forests older than 30 years and some natural virgin forests left which provided some natural cavities for Scaly-sided Merganser to breed.

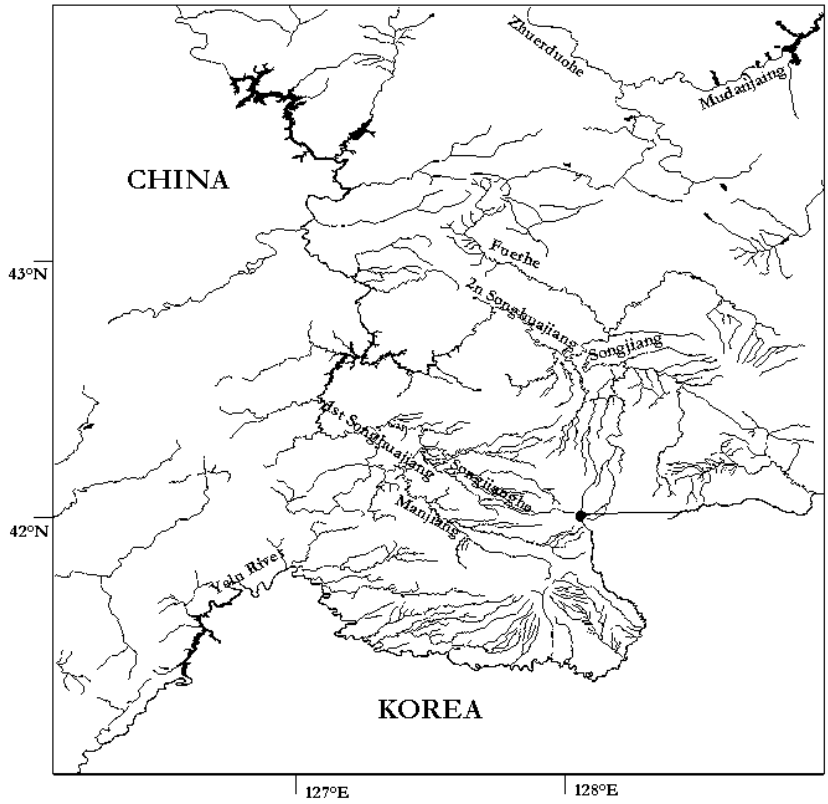
Survey Stretches

According with the information we collected about Scaly-sided Merganser's distribution in Changbai Mountain range, we selected most of our survey stretches in the two river systems of Songhuajiang and Yalu. In recent years, we got information about finding of Scaly-sided Merganser near Jingpo lake in Mudanjiang range. We suspected that there was a distributive connection between Songhuajiang and Mudanjiang. So we selected two survey stretches in the source tributaries of Mudanjiang. We selected stretches according with the following rules:

1. The start point should be further than 30 km away from the river head. Because the study result of Russian colleagues showed that the habitat in the upper 30 km of each river is not suitable for the Scaly-sided Merganser (Kolomiytsev, 1990).
2. The stretch should be suitable for boat or walking survey. Those rivers with water wider than 300 m are not suitable for observing Scaly-sided Mergansers, and should be omitted.
3. The length of each survey stretch should be longer than 20 km, better longer than 30km. Before

the field survey, we had carefully studied and selected the rivers of the Changbai Mountains with software of Google Earth. After discussing with Dr. Diana, we select 8~10 survey stretches. Besides, all the geographic coordinates of the both-ends of each stretch were given out in advance. But due to less raining in this spring, some rivers became very shallow and not suitable for rubber-boat survey. So, we have to do pre-detections to some rivers with which we are not familiar and make some adjustment to our implement plan.

Figure 1
Study Area and Survey Stretches



Method

In this survey, we use the method described in the articles written by Dr. Diana on TWSG NEWS No.14, October 2003 and TWSG NEWS No.15, December 2006.

Densities

In this survey, totally in 268.5km, 9 survey stretches in different rivers were surveyed with rubber-boat floating. 266 individuals, 102 estimated pairs of Scaly-sided Mergansers were counted. Two river ranges with extreme high breeding densities were found. An unproved distribution vacancy of breeding population was found between Jilin and Heilongjiang Provinces.

The survey data of the Scaly-sided Merganser breeding population in 2008 spring in the Changbai Mountains were given in Table 2 and we made the estimation to the number of breeding pairs in each stretch surveyed. The spring densities were given in Table 3. The average density of the Scaly-sided Merganser over all the rivers we surveyed was 0.91±0.89 inds/km, and the average breeding density

was 0.35±0.35 pairs/km.

TABLE 1

Survey Date and Stretches

Survey date	River name	Survey distance, km	Coordinate of Start Point	Distance to river head, km
Apr.13	1st Songhuajiang	38	42°12'16.30"N 127°13'25.92"E	200
Apr.14	Songjianghe	29.5	42°7'41.44"N 127°39'15.49"E	40
Apr.15	Manjiang	34	41°57'10.59"N 127°34'32.15"E	100
Apr.17	Fuerhe	33	42°58'53.48"N 127°48'15.65"E	60
Apr.18	Songjiang	26	42°34'43.61"N 128°14'50.04"E	60
Apr.19	Mudanjiang	21	43°41'0.78"N 128°35'48.33"E	150
Apr.20	Zhuerduohe	26	43°53'12.32"N 128°1'16.42"E	50
Apr.21	2nd Songhuajiang	29	42°41'30.72"N 127°52'20.38"E	200
Apr.22	Yalujiang	32	41°47'57.39"N 126°54'34.84"E	200
Total	**9 stretches**	**268.5**		

TABLE 2

Numbers of the Scaly-sided Merganser Counted and Estimated Pair Numbers

River	Pair #	Trio #	Single male #	Single female #	Flocked bird #	Estimated pair #
1st Songhuajiang	22	5		2	26	27
Songjianghe	6	2	1	2	10	9
Manjiang	10	1	1	1		12
Fuerhe	23	4	7		10	34
Songjiang	10	2	2	5		14
Mudanjiang					4	0
Zhuerduohe						0
2nd Songhuajiang	1	1	1	2		3
Yalujiang				3		3
Total	**72**	**15**	**12**	**15**	**50**	**102**

TABLE 3

Scaly-sided Merganser Density (birds/km) and Breeding Density (pairs/km)

River	# of birds	Pair # estimated	Survey distance, km	Breeding Density	Density
1st Songhuajiang	87	27	38	0.711	2.289
Songjianghe	31	9	29.5	0.305	1.051
Manjiang	25	12	34	0.353	0.735
Fuerhe	75	34	33	1.030	2.273
Songjiang	33	14	26	0.538	1.269
Mudanjiang	4	0	21	0	0.190
Zhuerduohe	0	0	26	0	0
2nd Songhuajiang	8	3	29	0.103	0.276
Yalujiang	3	3	32	0.094	0.094
Total/Average	**266**	**102**	**268.5**	**0.35**	**0.91**

Sex-age Structure

When making breeding pairs estimation, we count female Scaly-sided Mergansers in flocks with sub adult males as non-breeding females. The flocks we counted in the breeding survey were given in Table 4. If there were adult males in flocks, we still thought they were pairs. In this survey, we counted 8 flocks in total 50 birds. The proportion of flocked birds was 18.8%.

The Scaly-sided Merganser Sub adults flock in the second half of survey stretch in 1st Songhuajiang river.

TABLE 4

Scaly-sided Merganser Flocks Counted in Breeding Survey

River	Flock components	Flocked bird #
1st Songhuajiang	4 sub adult males+3 females	7
1st Songhuajiang	4 sub adult males+5 females	9
1st Songhuajiang	Sex-age unidentified flock	10
Songjianghe	1 adult mals+3 females	4 (could be 1 pair or 1 trio)
Songjianghe	2 sub adult males+4 females	6
Fuerhe	4 females	4
Fuerhe	4 sub adult males+2 females	6
Mudanjiang	3 sub adult+1 female	4
Total/Proportion		**50 birds, 18.8%**

In this survey, we counted 40 sub adult males and 77 adult males. The sub adult males were 34.19% to all males and 15.04% to the total numbers of the Scaly-sided Mergansers we counted. There were 10 pairs were observed that formed with sub adult males. The proportion of the pairs formed with sub adult males was 9.80%. Total 15 trios of Scaly-sided Merganser were counted in this survey. The trios proportion was 14.71%. No trios formed with sub adult males were observed in this survey.

Scaly-sided Merganser sub adult male

Breeding pair formed with a sub adult male. In spring, the plumages of some sub adult males changed a lot and much alike an adult male.

TABLE 5

Scaly-sided Merganser Sex-age structure in Changbai Mountains, spring 2008

River	Male #	S-ad male #	Pairs formed by S-ad male	Trio #
1st Songhuajiang	35	8		5
Songjianghe	12	4	2	2
Manjiang	12	4	4	1
Fuerhe	38	15	2	4
Songjiang	14	6	2	2
Mudanjiang	3	3		
Zhuerduohe	0	0		
2nd Songhuajiang	3	0		1
Yalujiang	0	0		
Total/Proportion	**117**	**40, 15.04%**	**10, 9.43%**	**15**

Discussion

Distribution Area

In recent years, we got information about finding of some Scaly-sided Mergansers near the Jingpo lake in the Mudanjiang drainage area, Helongjiang Province. We suspected that there was a distributive connection between the two rivers of Mudanjiang and Songhuajiang. Trying to prove this, we setup two survey stretches along the source and up reach of the Mudanjiang river. But the survey results of this two stretches did not support our assumption. It seemed that there was a distributive vacancy of Scaly-sided Merganser breeding population between this two river systems. Is there any distributive connection between the Changbai Mountains, China and the Far East of Russia? We suspect that the strip area of highly developed Yanbian Korean Automatic Zoon could be a possible distributive vacancy. At least, we have not gotten any confirmative distribution report of the Scaly-sided Merganser in this area. We think it is necessary to make out whether the two key breeding grounds in Changbai Mountains, China and the Far East, Russia are seriously isolated from each other. This will let us know the edges of each distribution area or distribution island.

Habitat at the end of the Zhuerduohe survey stretch The habitat on the upper reach is better. But still not find Scaly-sided Merganser. Behind the trees on banks are large areas of farmlands. Habitat in Grade 2. The lower reach is even worse.

In this survey, there were two stretches with breeding densities higher than 0.7 pairs/km. One is the 1st Songhuajiang, and the other is the Fuerhe river. The Fuerhe river is a source tributary of the 1st Songhuajiang river. The habitats of some places along the Fuerhe river are in Grade 3 or 4 with calm water and rich in small fishes. But the habitats along the 1st Songhuajiang are not as good as Grade 3. In fact, the stretch of the 1st Songhuajiang was divided into two halves. The first half is 19.5 km and the second is 18.5 km long. There is about a 6 km stretch between the two halves. Due to this river crosses through a county, and there were too many people disturbances, as well as the water was very shallow, we had to come back to the bank and walk through this 6 km stretch. In the first half, only 1 single female was counted, but in the second half of this stretch, total 87 birds were counted. If we only count the Scaly-side Merganser numbers and the length of the second half, the density would go up to 4.65 inds/km and the breeding density to 1.46 pairs/km. The densities in this short range were so high that the nearest distance between pairs even no longer than 30 m. There were also 3 flocks in total 26 birds were counted.

So many Scaly-sided Mergansers aggregated in so restricted a habitat and the high differences in densities over all the stretches surveyed might just be explained as lacking of suitable breeding

habitats for the Scaly-sided Merganser. This crowded situation should be paid much more attention. The habitat there could be very fragile as the short stretch.

Possible Migratory Stopover Site

The density of Scaly-sided Merganser in the stretch of the Yalu river in this survey is only 0.094 inds/km. We only counted 3 single females. As we believed that there were breeding population of Scaly-sided Merganser in this area, and high density of spring population was observed on March 24 in this year, so we estimated these 3 single females as 3 breeding pairs even there were no males appeared in the whole stretch when surveying.

The Yalu river is a boundary river between North Korea and China. We presumed that there is a pathway for Scaly-side Merganser migration along the whole river or in definite ranges of this river. The stretch we surveyed is a very special range. Every spring, no sooner than the river is open, when the Scaly-sided Merganser scarcely can be found in other rivers, some of this bird will come to this site and stay there for about one month. And in autumns, when the Scaly-sided Mergansers in some other rivers have already left, there would be still some Scaly-sided Mergansers stay at this range until the weather become cold enough or the river is covered with ice.

According to the observation in March, 2008, we estimated the density in this range could approach 2 inds/km then. But in the middle of April, they suddenly disappeared. They could move to the suitable breeding sites in other places. So we think, this range is not a main breeding place but a possible important migratory stopover site.

In very early spring, some breeding Scaly-sides Mergansers will come to the Linjiang range of the Yalu river and stay here for some days. There are 4 males and 5 females in this picture.

Reference

Valeri Shokhrin & Diana Solovieva. 2003. Scaly-sided Merganser Breeding Population Increase in Far

East Russia. TWSG NEWS No. 14:43~51.

Solovieva D., Shokhrin V., Vartanyan S., Dongdua A. & Vartanyan N. 2006. Scaly-sided Merganser Survey in Primorye, Russia, 2003-05. TWSG NEWS No. 15:60~69.