

Surveys and Conservation of the Scaly-sided Merganser (*Mergus squamatus*) in Russia - Continuation

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Scaly-sided Merganser (*Mergus squamatus*) is among the most rare seaducks of the Old World. It breeds in a restricted area in the south-east Russia and north-east China and spends the winter inshore off China and Korea. The majority of breeding population occurred in Primorye, Russia (BirdLife International 2001). The Scaly-sided Merganser is included in the Red Data Books of IUCN (third list – endangered), Russia (category 3 – rare), China and South Korea.

Scaly-sided Mergansers inhabit clean rivers in mountainous forests, where suitable cavities for nesting may be found. Although the biology of the Scaly-sided Merganser is still poorly studied, the threats are seemingly due to human influence through habitat loss, persecution and disturbance. However, the affect of each factor is uncertain.

Long-term target of the Project “Surveys and Conservation of the Scaly-sided Merganser (*Mergus squamatus*) in Russia” was to estimate the number and current status of the globally threatened Scaly-sided Mergansers on the Russian breeding grounds, to investigate factors affecting breeding population in order to improve conservation efforts and attract public attention to the conservation of the species.

The part of the Project, sponsored by Booster Rufford Small Grant- 2005/06 aims:

- Surveys for breeding pairs (April) along all rivers with AN. This will serve for breeding population trend and trend’s dependence on AN program. Brood surveys are planned along the rivers of study area in July, this will give data on young survival and brood distribution.
- Checking of all AN is planned for their occupancy by mergansers in early May, secondary checking for nest success in May-June. Difference in AN occupation along logged and unlogged rivers allow estimating of habitat loss. Cleaning and repairing of AN before merganser nesting is needed and planned for late March.
- Marking of females from AN and from wild nests is planned in May-June. Continuation of site fidelity and survival studies.
- Marking of newly-hatched ducklings is the new approach to demography studies under the project. If females that hatch in AN later will be found nesting in AN the possibility for creation of AN nesting population will be proved.

- As in previous years the lectures and talks for local people, mainly children, making the video trailer about project and publishing of popular and scientific papers are planned during (March-July) and after field season (until the project end in 2006).

Results versus Objects and Particular Challenges faced and Solutions adopted

Fieldwork was started on 25 of March and terminated on 11 of June 2006. Most of the delays with surveys were related to cold and prolonged spring with unusual snowfalls in late April.

Surveys for breeding pairs and broods along the rivers with artificial nests

We continued spring surveys for breeding pairs of Scaly-sided Merganser along selected rivers of Primorye. The timing and results of spring surveys are presented in table 1. Unfavorable weather conditions made surveys on some rivers difficult and even impossible. We couldn't complete survey on Pavlovka-river: two attempts were made on 28 April and on May with no success during the first attempt and with 15 km surveyed during the second one. Ice-breaking there was late and it peaked on 27-29 April. Crew fell down from the rubber boat (figure 2). High water continued until mid-May in Pavlovka-River: on 14 May we surveyed just five Scaly-sided Mergansers, all of them at side channels and ox-bows. No birds occurred at the main stream. This survey was stopped because river stream is blocked with logs.

We failed to reach Vasilkovka-River on 12 May: it was impossible to cross the tributary because of thick ice on banks.

After unsuccessful attempts on Pavlovka and Vasilkovka we canceled the trip to Iman-River because it seemed the waste of time. Optimal period for breeding pair survey is between 12 April and 1 May when mergansers occur in pairs (Shokhrin & Solovieva 2003). Later with incubation onset and male departure there is a high chance for underestimation of pair number on the river.



Figure 2. Unsuccessful survey on Pavlovka-River on 28 April: crew felt down from the boat, boat got under the bridge.

Table 1. Results of spring survey for breeding pair of Scaly-sided Merganser, Primorye, 2006.

River	Date(s)	Distance, km	Breeding pair density, bp/km	note
Avvakumovka	27 and 29 Apr	52	0,2	
Kievka	18, 19 and 22 Apr	83	0,81	
Krivaya	18 Apr	10	0,9	
Lazovka	18 and 22 Apr	no	Unkn.	Ice covered
Margaritovka	30 Apr	18	0,22	
Pavlovka	28 Apr	no	Unkn.	Ice break
Pavlovka	14 May	15	Data incorrect	High water
Vasilkovka	May	no	Unkn.	Impossible to reach

Analyzing weather situation in spring 2005 and 2006 we can state that successful surveys on 20 rivers in 2003 (see our report for Rufford Small Grant – 2003) was a good luck of the project. It seems now impossible to survey all rivers with artificial nests annually.

Results of spring survey show Scaly-sided Merganser increase on Kievka and it's tributary Krivaya and some decline on Avvakumovka comparing to 2005. Further data gathering is needed for reliable analyses of between year and between river fluctuations.

Brood surveys took place along the rivers of study area, which are Kievka-River and it's tributaries: Benevka, Lazovka, Krivaya, and Perekatnaya. Survey results are given in table 2.

Table 2. Results of summer survey for Scaly-sided Merganser broods, Primorye, 2006.

River	Date(s)	Distance, km	Brood density, bro/km
Kievka	23-25 July	83	0,35
Lazovka	22 July	18	0,22
Perekatnaya	19 July	20	0,20

Artificial nest program

There are 140 artificial nests built and placed for cavity nesting ducks in Primorye during this project work in 2000-2004. In 2006 we were able to check 109 of them. Other 31 artificial nests are situated on the rivers Vasilkovka and Iman with tributaries Krasnaya and Berezovaya, all inaccessible due to weather conditions.

Table 3. Number of artificial nests on the rivers of Primorye.

River	year	# tubes	# boxes	sum AN	tubes left in 2006	boxes left in 2006	sum AN left in 2006	tubes added in 2006	boxes added in 2006	sum AN in late spring 2006
Avvakumovka	2001	10	0							
	2003	0	10							
	sum	10	10	20					0	
Berezovaya	2001	2	0							
	sum	2	0	2	unkn	0	unkn			
Iman	2000	6	0							
	2001	6	0							
	sum	12	0	12	unkn	0	unkn			
Kievka	2001	10	0							
	2003	0	10							
	2004	16	0							
	sum	26	10	36						
Krasnaya	2000	1	0							
	2001	3	0							
	sum	4	0	4	unkn	0	unkn			
Krivaya	2004	6	0							
	sum	6	0	6	6	0	6	0	0	6
Lazovka	2001	1								
	2003	0	2							
	2004	1	1							
	sum	2	3	5	2	3	5	0	0	5
Margaritovka	2001	6	0							
	2003	0	6							
	2004	5	0							
	sum	11	6	17	10	6	16	1	0	17

Mineralnaya	2001	3	0							
	2003	0	2							
	sum	3	2	5	2	2	4	0	0	4
Pavlovka	2004	20	0							
	sum	20	0	20	18	0	18	0	0	18
Vasilkovka	2004	13	0							
	sum	13	0	13	unkn	0	unkn	0	0	unkn
TOTAL		109	31	140						

Main reason of tubes and boxes disappearance is human activity. Some tubes or tube remains were found displaced under the trees. Box remains were never found, it seems that people removed boxes for their purposes. Once the tube fell down together with the tree and once the tubes were destroyed by woodpecker.

Table 4. Occupancy of artificial nests in 2006.

River	# nests	Occupied by					Filled with	
		Scaly-sided Merganser	Mandarin Duck	Mallard	Flying Squirrel nest	Passerine	Winter nest* of Black/Flying Squirrel	
TUBE-FORMED NESTS								
Avvakumovka	11	0	0	0	0	0	1	
Kievka	28	5	2	1	1	0	1	
Krivaya	6	1	1	0	0	0	1	
Margaritovka	9	0	0	0	0	0	0	
Pavlovka	18	1	0	0	0	0	4	
Total	72	7	3	1	1	0	7	
Per cent	100	9,7	4,2	1,4	1,4	0	9,7	
BOX-FORMED NESTS								
Avvakumovka	12	0	3	0	0	0	3	
Kievka	12	2	2	0	0	1	2	
Margaritovka	6	1	1	0	0	0	0	
Total	30	3	6	0	0	1	5	
Per cent	100	10	20	0	0	3,3	16,7	
WILD CAVITIES								
Total	6	2	1	0	0	0	0	
Per cent	100	33,3	16,7	0	0	0	0	

* - one owl winter roost is included

Occupation rate for tubes and boxes by Scaly-sided Merganser was almost equal in 2006 (9,7 and 10 % accordingly) and it was less than occupation rate for wild nest cavities found with active

SSM or Mandarin Duck nests during 2003-2006 (33,3%). However nest success in boxes was significantly lower than that in tubes (33,3% versus 100%) mostly due to nest abandonment. These peculiarities of artificial nest construction should be studied in following years.

Individually marked population of Scaly-sided Merganser at study area

Adults. In spring 2006 we caught one male and nine females Scaly-sided Mergansers. Among them a male and seven females were marked with yellow plastic rings with alphabetic code. Two females have been marked in previous years. Eight females were equipped with geolocators MK-9 in 2006 (see Changes to the project). After field season of 2006 there is more than 25% of nesting females individually marked at study area. Further marking of nesting females is needed for reliable survival and site fidelity estimation. Female recovery rate at the same nest cavity is presented in table 4.

Table 4. Recoveries of nesting Scaly-sided Merganser females to the same nest cavity, Primorye, 2003-2006.

	Total # females ringed in			
	2003	2004	2005	2006
	3	5	5	5
Reported in				
2004	2			
2005	0	1		
2006	0	1	3	

Newly-hatched ducklings. Total of 33 newly-hatched ducklings from three nests were marked with fish web tags (fig.3). Measurements and weights were taken.



Figure 3. One-day old Scaly-sided Merganser marked with web tag. Kievka-River, Primorye, May 2006.

Information and Education

Lectures and talks were given in Kishinevka, Lazo, Gornovodnoye and other villages of Primorye. Six new volunteers were involved in the field-work. Special I&E project is started (see Project Perspectives). One scientific and one popular papers were published in 2006. Oral presentation was given on the First Pan-European Duck Symposium, Denmark.

Changes to the Project

Funding confirmation for this grant has been received in June 2005 after the field season 2005. It was due to our application for Whitley Award (deadline October, 31) has been rejected and we had to apply for Booster Rufford Small Grant for the next deadline on January, 31. Agreement was achieved with Rufford Small Grant Program Manager and the timing of grant work is moved to spring and summer 2006. Field season of 2005 hasn't been lost due to quick financial support provided by Wildfowl and Wetlands Trust, UK. Now the project is lasting for 6 years (start in 2000) with the only gap in 2002.

Expenditure versus Budget

Item	Budget, £ sterling	Expenditure, £ sterling
Air tickets St.Petersburg-Vladivostok: round trip, 3 persons	1117	1117
Air cargo St.Petersburg-Vladivostok and back: 75 kg of field equipment and tools	125	125
Car rent (including petrol), £19 a day, 67 days	1273	1273
Lorry rent (including petrol), £19 a day, 5 days	95	95
Per diem: food and accommodation (£12 a day/person): D. Solovieva – 60 days; S. Vartanyan – 60 days; V. Shokhrin – 30 days, A. Dondua – 30 days; total – 180 day/persons	2160	2160
Communication (phone, fax, mail)	75	75
TOTAL	4845	4845

Miscellaneous expenses occurred during the fieldwork-2006 and they were related to car repairing in field conditions. All these expenses were covered from miscellaneous part of the project "Locating of wintering grounds and stopover sites of Scaly-sided Merganser".

Project Perspectives

Current project is now the long-term complex work on management and conservation of the endangered Scaly-sided Merganser. Among the main results there is an Artificial Nest Program (ANP), which has been extended in 2004 with placing of additional tubes. Nest tubes and nest boxes need to be checked annually for their occupancy by Scaly-sided Merganser. Total of 8 broods (apr. 80 ducklings of Scaly-sided Merganser) hatched in our artificial nests in 2006. We expect increase of occupation of artificial nests in the following years especially on logged rivers Kievka, Krivaya, and Pavlovka with high density of breeding pairs.

Important features such as nest success, survival, site fidelity, and the age of first breeding are possible to investigate now when we have marked about 25 per cent of nesting females at study area. We are going to continue demographic studies using females and young from artificial nests. We will continue surveys for breeding pairs and broods.

Two additional projects were started, which are closely related to the current project: “Locating of wintering grounds and stopover sites of Scaly-sided Merganser” and “Surveys and Conservation of the Scaly-sided Merganser (*Mergus squamatus*) in Russia: information and education program”.

The aim of the first mentioned project is to identify as accurate as possible the winter grounds, migration routes and stopovers of the Scaly-sided Merganser females breeding in Primorye, Russia. We used geolocating loggers (GLS MK9 type, British Antarctic Survey) to record geographical location of Scaly-sided Merganser females. Loggers are attached to plastic rings. Females were caught at nests and ringed with loggers under the current project. Loggers and notebook PC were paid from special grant of Wildfowl and Wetlands Trust, UK. Catching of the same females in 2007 is required for download of information from loggers. Drawing up the wintering grounds of Scaly-sided Merganser will improve international conservation efforts. We got in contact with Dr. Mark Barter and Cao Lei both working on locating of Scaly-sided Merganser wintering grounds in China. The data from loggers will be shared with Chinese colleagues for them and us to survey poorly known wintering sites. The network of important for Scaly-sided Merganser stopover and wintering sites will be mapped and published and an attention will be attracted to the most important sites.

Second related project is an Information and Education Program. During the current project we found that the main source of female and brood mortality is bycatch during summer fishing on brood-rearing rivers. Many of local fishermen aren't informed about protected status of Scaly-sided Merganser. They kill bycatch for nothing. We are working out printing of 500 colour posters with recall to release duck bycatch from mist-net. Posters will be distributed in all

villages along the most important nesting rivers of Primorye in 2006 and 2007. Project is supported by Forestry Bureau, Government of Taiwan.

Scientific papers and popular articles were published and are planned for future publications. Lectures about the project were given in local villages and schools. About 65 volunteers are involved in the project by the moment. They are local children, hunters, and environmentalists from Primorye, from other regions of Russia and from abroad. We believe in involving of more volunteers in future.

We are going to apply for Whitley Award for Nature Conservation again in 2006.