



Strengthening the financial sustainability of the system of protected areas in Georgia

Monitoring of Velvet Scoter breeding at Lake Tabatskuri Georgia

Final Report



Contract N: CNF / 2021 / TAGA-GEO-157

Authors: Nika Paposhvili, Zura Javakhishvili, Nika Melikishvili, Sophio Kiknavelidze

Submission Date: March 2022



Any opinions, views, conclusions or recommendations presented in this report are those of the authors and do not necessarily reflect the views of the Foundation, its staff or funders.



Introduction.

The Velvet Scoter (*Melanitta fusca*) is considered to be decreasing worldwide and is classified as Vulnerable by IUCN (BirdLife International 2021). Two distinct populations are recognised within the Western Palearctic, of these, the largest in numbers (141 000–268 000 mature individuals) breeds across the boreal and montane regions of northern Europe and western Asia and winters mainly in the north and northwest Europe (Cramp & Simmons 1977; Dagys 2016; BirdLife International 2021). However, a small, isolated population also breeds in eastern Turkey, Georgia and Armenia, wintering most probably in the Caspian and Black Sea areas (Cramp & Simmons 1977; Dagys 2016; BirdLife International 2021). The breeding population of Velvet Scoter was no more than 1,500 individuals in the mid-1990s in Georgia, Turkey and Armenia, but all indications suggest a rapid decline in recent years (Wetlands International 2012). The sharp drop in the water level of Lake Sevan has led to the loss of the Velvet Scoter nesting area, resulting in the extinction of the species nesting population in Armenia (Adamian & Klem 1997). As a result of habitat loss, disturbance, and climate change, the breeding population of Velvet Scoter is also considered extinct in Turkey (Boyla et al. 2019). According to unpublished and published information, the breeding distribution of the Velvet Scoter in Georgia extended to the Saghamo, Paravani, Khanchali, Bughdasheni, Madatapa, Kartsakhi and Tabatskuri Lakes on the Javakheti plateau of southern Georgia in the 1960s and 1990s (Janashvili et al. 1960; Flint et al. 1968; Kutubidze 1985; Boehme et al. 1987; Zhordania et al. 1999). Even as late as the early 2000s, Velvet Scoters were reported breeding at Khanchali, Bughdasheni and Madatapa Lakes on the Javakheti plateau, with 10–20 breeding pairs on Khanchali Lake and smaller numbers on Bughdasheni and Madatapa Lakes (Matcharashvili et al. 2004; Gavashelishvili et al. 2005). BirdLife International reported 20–50 breeding pairs of Velvet Scoter at Lake Kartsakhi in Georgia at that time (BirdLife International 2004). According to the latest studies, due to the degradation of nesting sites caused by human impact, the breeding population of Velvet Scoter, 25–35 pairs, currently remains only in Tabatskuri Lake in Georgia, but the Scoter's reproductive success is quite poor and the long-term survival of the population remains at risk (Paposhvili 2018).



The Research Goals

Goal of this research is to evaluate the population trend of Velvet Scoter breeding at Lake Tabatskuri and assess the direct causes of the Velvet Scoter's poor reproductive success.

The main objectives are:

1. Detection/evaluation of potential breeding pairs of Velvet Scoter at Lake Tabatskuri before nesting.
2. Mapping of all nest of Velvet Scoter found on island at Lake Tabatskuri.
3. Systematic monitoring of broods at Lake Tabatskuri after hatching.
4. Evaluation of different limiting factors and threats causing low reproductive success.

The Study Area and Research Methods

The Tabatskuri Lake (41°39'N, 43°38'E) is located at 2,000 m above sea level, has a surface area of 14.2 km², a maximum depth of 43 m (average depth = 15 m) and retains a clean water column. The area experiences cold winters with snow cover extending to 150 days. Mean daily temperatures are –8°C in January and 12°C in July. The small island (1 ha) in the northern part of the lake is now the only natural breeding place for Velvet Scoter in Georgia, potentially in the whole Caucasus.

The research was conducted in May–October 2021 (44 field workdays in total) at Lake Tabatskuri. At the beginning of the breeding season (late April and May), the whole lake was surveyed once a week (5 times in total) using telescopes and binoculars from fixed points overlooking the entire lake, with the number of males and females present being counted (direct count method, Bibby et al. 2000) on each date (Figure 1 & 2).

Within the incubation time (June–July), the Velvet Scoters nests were detected and mapped by two or three observers walking closely abreast intensively searching the island for nests (Figure 3; 4 & 5). We also deployed camera traps at nests (in total 5 cameras) where vegetation allowed monitoring of the nest without disturbance to the sitting female (Figure 6; 7 & 8). All of the nests were checked again after the main hatching period (August) to count the numbers of hatched/addled eggs (Figure 9) in each nest and take the camera traps off (9 field workdays in total).

After hatching period (late July), daily observations were conducted in the north part of the lake on the broods for the first three weeks after they moved to water (Figure 10), and then once a week until the end of October, from a safe distance without disturbing them using telescopes and binoculars from fixed points overlooking the entire lake, to determined major threats to the species (30 field workdays in total). During this whole time, disturbance by boats and the presence of large gulls were continuously scanned. The five main areas of the lake differential using Velvet Scoters during different periods of the summer are mapped in Figure 11.



Field equipment: binoculars (Vanguard ED 8x32; Vanguard ED 10x42; Zeiss Conquest HD 10x42), GPS receiver (Garmin 64x), radios (Motorola T402), camera (Canon 7D Mark II + Canon 100-400 L II) and spotting scope (Swarovski ATS-80, 25-50x80mm and Zeiss Conquest Gavia 85, 30-60x85mm) owned by Ilia State University Institute of Ecology and the environmental organization "GARIELI".

Field research was conducted by Nika Paposhvili, Ph.D. student of Faculty of Natural Sciences and Medicine Ilia State University. Nika Melikishvili and Sopio Kiknavelidze, M.Sc. students of the same University, were also involved in the field research. This report was prepared by Nika Paposhvili. Cover photo: Nika Paposhvili – “The Velvet Scoter with its only duckling”.



Figure 1. The image showing the counting point with the equipment that was used to survey/count the number of males and females Velvet Scoter present on the lake.



© N. Papushvili



Figure 2. The image showing the birds (male and female Velvet Scoters) through a spotting scope.



© N. Melikishvili

Figure 3. The image showing the three observers walking closely abreast intensively searching the island for the nests.



Figure 4. The image showing the female Velvet Scoter sitting on the nest.



Figure 5. The image showing the Velvet Scoters nest.



Figure 6. The image showing suitable Velvet Scoter nest for the deployment of camera traps.



Figure 7. The image showing female Velvet Scoter sitting on the nest suitable for the deployment of camera traps.

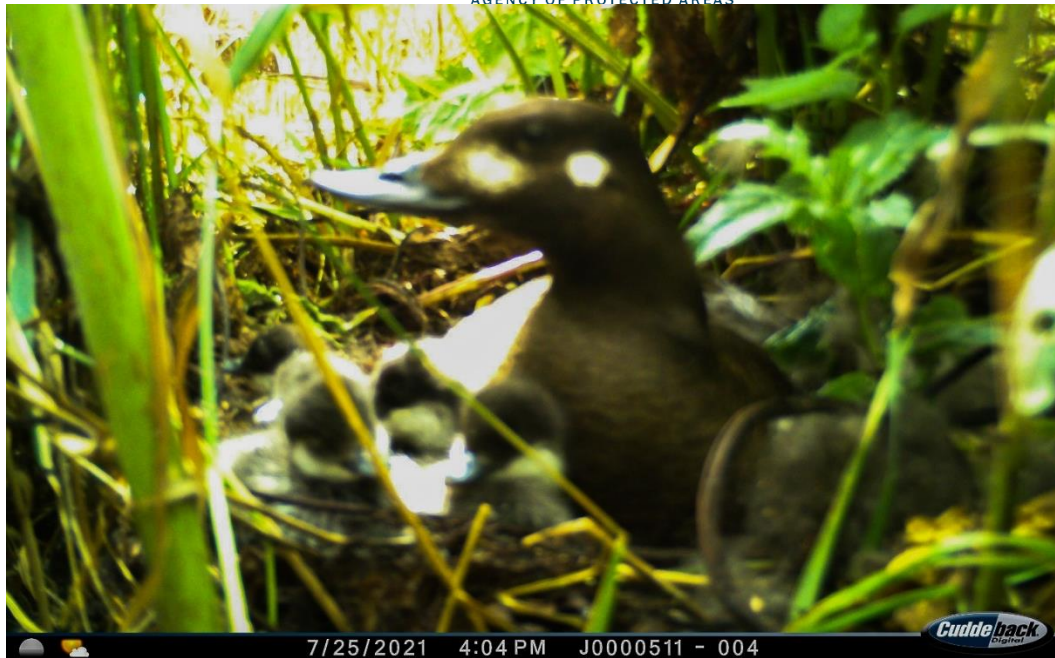


Figure 8. The image showing newly hatched ducklings in the successful nest.



Figure 9. The image showing hatched and added eggs in Velvet Scoter nest.



WWW.APA.GE



დაცული ტერიტორიების სააგენტო
AGENCY OF PROTECTED AREAS



გეგმვა და
შედეგების მართვა



Figure 10. The image showing the two broods after they moved to the water (the image was pictured during the daily observations through a spotting scope).

Legend



1 2 3 4 5

1. Core area used during nesting
2. Area unused by birds
3. Area used for mating and feeding
4. Area used for moulting and feeding
5. Corridor area hardly used by birds

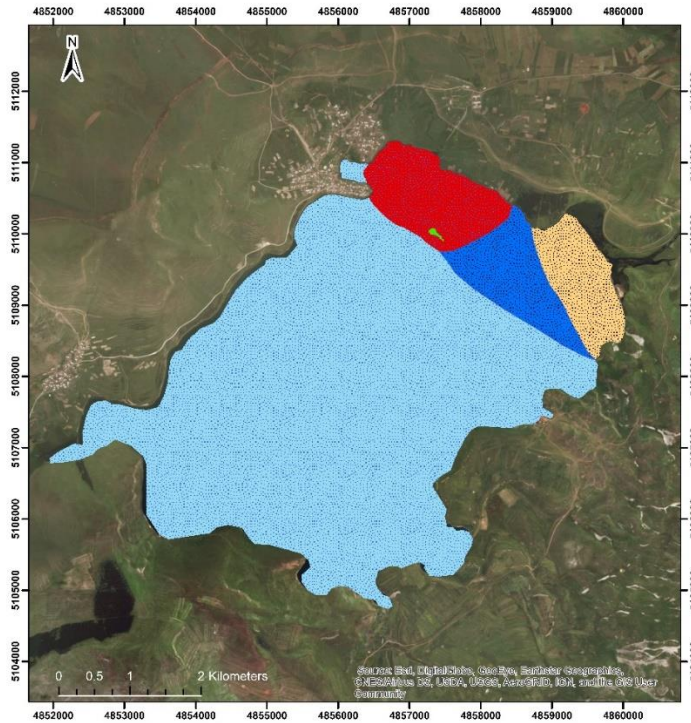


Figure 11. The map of Tabatskuri Lake showing the five main areas of the lake and their differential use by Velvet Scoters during different periods of the summer.

Results

Weekly counts made at Tabatskuri Lake at the beginning of the breeding season (late April and May) located a total of 20–95 birds from 29 April to 27 May (peaking at 95 on 20 and 27 May) in 2021 and during this period, the sex ratio ranged from 1 (29 April) to 1.08 (5 May), with a mean of 1.05 males per female (Figure 12).

In 2021, 35 nests were found. The nests are mapped in Figure 13. From these 35 nests, 26 were successful. Table 1 shows the clutch size and hatching success in 2021. A total of 325 eggs were found in all these 35 nests, of which 148 eggs failed to hatch, a hatching rate of 0.54%. Unfortunately, it was not possible to determine duckling survival rates from individual broods, but the 177 hatched eggs gave rise to 29 fully-fledged young (Figure 14), which assuming all nests to have been found amounts to a 16% fledging rate, or 9% success rate from 325 eggs originally laid.

The five camera traps (in total 43974 images collected from 28th June to 15 August 2021) suggested that there are no land predators on the island and no scoters' eggs were collected on the island by people in 2021. Unlike previous years, when several times were observed attacks on the Scoters active



nest by Marsh Harriers *Circus aeruginosus* and Armenian gulls *Larus armenicus* (Paposhvili 2020), this year the cameras have not detected attacks from these birds. There were only two cases when wandering juvenile Armenian Gull approach the Scoter's nest and in both cases, the female Scoter sitting on the nest was attacked and kicked out the uninvited guest (Figure 15). Armenian Gulls (mostly juvenile) only were used addled eggs after incubation or from abandoned nests (Figure 16). All the nests (in total 5 nests) on which the camera traps were installed were successful this year. A total of 47 eggs were found in these 5 nests, of which only 10 eggs failed to hatch, a hatching rate of 0.79% (Table 2).

During the monitoring on the broods after they moved to water, a total of the 10 broods with 52 ducklings (Table 3) were detected in the north part of the lake Tabatskuri in 2021 (Figure 11). Note that, there was probably more broods here, though due to the amalgamation in some cases one female led several different broods united together (Figure 17). The whole observation time for all broods was 177 h 42 min in total from 21th July to 24 October (161 h 42 min before the ducklings reach the age of three weeks and 16 h after 3 week). During that time, six (12%) of the ducklings were predated by Armenian gulls before the age of 3 weeks (Figure 18); five (10%) of the ducklings were entangled and drowned in abandoned fishing net (Figure 19); twelve (23%) of the ducklings just were disappeared (it is likely they became a victim of Armenian gull, or have got entangled in a fishing net, or died due to a lack of food and bad weather) and only twenty-nine of the duckling were fledged (figure 14).

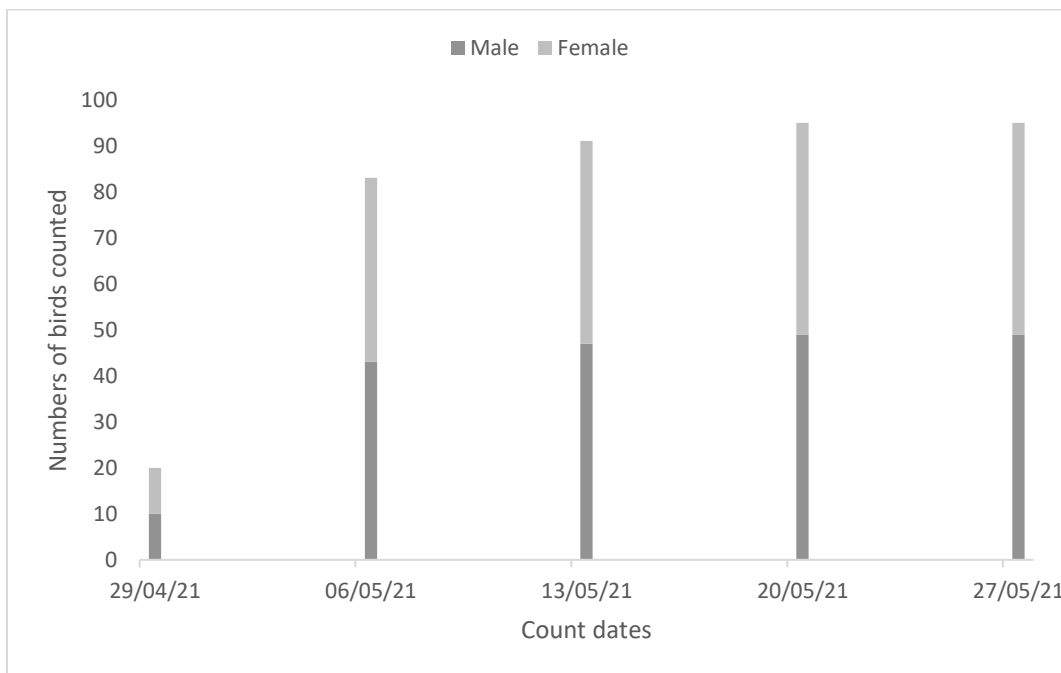


Figure 12. Numbers of male and female Velvet Scoter counted on Tabatskuri Lake, Georgia during regular counts made before nesting season in 2021.



Figure 13. Aerial survey image showing the location of individual Velvet Scoter nests on the island in Lake Tabatskuri during 2021.

Table 1. Brood size and hatching success for all Velvet Scoter nests found at Tabatskuri Lake, Georgia in summer 2021.

Nest code	Clutch size	Hatched
1/2021	8	6
2/2021	10	6
3/2021	9	7
4/2021	9	8
5/2021	9	8
6/2021	10	0
7/2021	9	7
8/2021	9	6
9/2021	11	10
10/2021	9	8
11/2021	9	7
12/2021	12	0
13/2021	8	8
14/2021	12	5
15/2021	9	1
16/2021	9	9
17/2021	19	0



WWW.APA.GE



წარსულში ვართ, მომავალში ვართ.

18/2021	2	0
19/2021	9	6
20/2021	10	4
21/2021	26	0
22/2021	11	0
23/2021	9	9
24/2021	9	7
25/2021	2	0
26/2021	8	8
27/2021	8	0
28/2021	8	8
29/2021	7	6
30/2021	8	7
31/2021	8	5
32/2021	9	8
33/2021	8	5
34/2021	8	8
35/2021	4	0
Total in 2021	325	177 (54%)



Figure 14. The image showing the fully-fledged young Scoters leading with brood-rearing female (note that, from the eighth left is the male mixed with this flock).



Figure 15. The image showing a juvenile Armenian Gull approaching the nest and the reaction of the female Scoter sitting on the nest to its approach.



Figure 16. The image showing a juvenile Armenian using added eggs from the Scoter's nest after incubation.



Table 2. Brood size and hatching success for all Velvet Scoter nests monitored by camera traps at Tabatskuri Lake, Georgia in summer 2021.

Monitored nest code	Clutch size	Hatched
2/2021	10	6
7/2021	9	7
9/2021	11	10
19/2021	9	6
26/2021	8	8
Total	47	37 (79%)

Table 3. The brood size and fledging success for the monitored ten Velvet Scoter brood found at the Lake Tabatskuri, Georgia in summer 2021.

Brood code	Brood Size	Predated	Drowned	Disappeared	Fledged
1	4	1 (25%)	-	-	2 (50%)
2	12	-	-	-	11 (61%)
3	6	-	-	-	-
4	4	-	-	-	4 (100%)
5	6	-	-	-	3 (50%)
6	4	-	-	-	3 (75%)
7	5	3 (60%)	-	-	1 (20%)
8	5	-	-	-	4 (80%)
9	3	-	-	-	1 (33%)
10	3	2 (67%)	-	-	0
Total	52	6 (12%)	5 (10%)	12 (23%)	29 (55%)

Note that, it was not possible to determine the fledging success of brood N3 since this brood was united with brood N2 and only one female (probably female from brood N2) led for 18 ducklings together (presumably, this flock included not only two but 3-5 united broods). Unfortunately, it was also impossible to determine from which brood belonged the ducklings drowned in the abandoned fishing net we found.



Figure 17. The image showing the brood which consists of several different broods leading by one brood-rearing female.



Figure 18. The image showing the successful attack on the brood by Armenian gulls. The image is not high quality, but still enough to spot the duckling grabbed by the gull.



Figure 19. The image showing the drowned duckling bycatch in the fishing net.



Figure 20. The image showing the female stressful behavior induced by the camera trap.



Conclusions

The study made in 2021 revealed that 40–46 pairs were present at Lake Tabatskuri in the early breeding season, but only 35 pairs of nests were found at the lake and all that did so built nests on the only island in the lake. Previous observations (2017–2020) show the same pattern, more pairs are present at the lake during courtship than nesting individuals (Paposhvili 2020; Paposhvili 2018). It may be due to the existence of young individuals or with the scarcity of nesting territory. Based on results of previous monitoring effort (2017–2020) we can conclude that number of nesting females on the island grew to reach 35 breeding birds in 2021. We speculate that observed increase of breeding birds can be caused by the conservation activities. Various conservation activities were carried out by our team of young researchers and conservationists led by Nika Paposhvili and funded by CLP grant (for more information refer to <https://www.conservationleadershipprogramme.org/news/safeguarding-scoters/>).

Analysis of camera trap photos showed, that during breeding season of 2021, predation and disturbance of incubating females by Armenian Gulls and Marsh Harriers was insignificant. In contrast, during breeding seasons 2019 and 2020, predation of incubating females by Marsh Harriers and Armenian Gulls has been recorded. We speculate that difference in predation pressure can be explained by scarce grass cover on the island in 2019–2020. Hatching success in all nests under camera surveillance was higher (79%) than average of all nests (54 %). Incubating birds were still exhibiting some stressful behavior towards camera traps (Figure 20). Therefore, it is not advisable to use camera traps directly to monitor the nests, although camera traps can be used to control the nesting island.

Overall nesting success for Velvet Scoter breeding at Lake Tabatskuri in 2021 (54%) was lower than the 67–92% reported by Brown & Brown (1981) and 72–89% by Traylor et al. (2004) from North American studies of White-winged Scoter (*M. deglandi*). Reproductive success for hatched ducklings on Madatapa lake was lower (9 %) than recorded either in Finland (30%), or in North America (Mikola et al. 1994), but was similar (5–10%) to parts of North America (Traylor & Alisauskas 2006).

We think that, relatively low reproductive success might be caused by predation of Armenian Gulls on ducklings as well as by duckling bycatch in the fishing nets (Table 3). Other factors that may affect the population of Velvet Scoter at Lake Tabatskuri could be weather conditions and food supply. But, unfortunately, there is no information yet about the diet and food resources on Tabatskuri Lake. The main predator of ducklings on Lake Tabatskuri is the Armenian Gull. Consequently, the control of the gull population, elimination of illegal fishing and determining fishing areas/seasons would potentially have a positive impact on the scoters' reproductive success.

There are several measures of Gulls control (lethal and non-lethal) designed to improve duck productivity and duckling survival (Donehower & Bird, 2008). However, the effectiveness of these



measures depend on the local circumstances of the breeding Lake and the duck-gull interactions. Measures to reduce the numbers of gulls may increase the survival rate of the Scoters' ducklings. Reduction of numbers of Armenian Gull eggs on the nesting island can be done as a first step to prevent increasing food demand of the hatchlings. At the same time, additional measures may be required, to protect Scoter duckling from Armenian Gull specialized in predation.

Although effect of some of the limiting factors has been reduced due to conservation activities conducted in 2017-2021, the last breeding population of Velvet Scoter is still in great danger in the Caucasus.

We recommend following research and conservation activities:

1. Monitoring of potential breeding pairs of Velvet Scoter at Lake Tabatskuri before incubation.
2. Mapping and monitoring of Velvet Scoter nests on the nesting island at Lake Tabatskuri.
3. Systematic monitoring of hatched broods at Lake Tabatskuri.
4. Determining the main food sources of Velvet Scoter at lake Tabatskuri and assessing the resources available in the lake.
5. Assessing and monitoring of Armenian Gull breeding population at Lake Tabatskuri.
6. Establishing the restricted access zone 200 m around the island from May to the end of August (it is necessary to mark restricted area with buoys).
7. Marking a vital area (Figure 11, Zone 3) with buoys, banning fishing (July to September) and control.
8. Training of local rangers, transfer of relevant equipment (binoculars, telescope) and maximum support for monitoring the Scoters and designated areas.
9. Raising awareness and cooperation in the local community (including involving locals in the project; raising awareness and cooperation with fishermen/hunters; placing information or/and warning banners in the vicinity of Lake Tabatskuri and on the island; educational activities in local schools).

Note: It is advisable to involve at least one expert, local rangers and local residents in the process of marking important places of Velvet Scoter. However, before marking the area and establishing any restrictions, it is highly advisable to meet with the locals, provide information and discuss/share their opinion.



Bibliography

Adamian M. S. & Klan D. 1997. Birds of Armenia. Published by the American University of Armenia. Yerevan, Armenia.

Bibby C. J., Burgess N. D., Hill D.A., Mustoe S. H. 2000. Bird Census Techniques. Academic Press. Great Britain. ISBN 0-12-095831-7

BirdLife International 2004. Birds in Europe Population Estimates, Trends and Conservation Status. BirdLife International, Cambridge, UK.

BirdLife International. 2020. *Melanitta fusca*. The IUCN Red List of Threatened Species 2020: e.T22724836A183801134. <https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T22724836A183801134.en>. Downloaded on 02 November 2021.

Boehme R.L., Zhordania, R.G., Kuznetsov, A.A. 1987. Птицы Грузии. [Birds of Georgia] Publishing "Сабчота Сакартвело" Tbilisi.

Boyla, K.A., Sinav, L. ve Dizdaroğlu D.E. (2019). Türkiye Üreyen Kuş Atlası. WWF-Türkiye, Doğal Hayatı Koruma Vakfı. İstanbul.

Brown, P.W. & Brown, M.A. 1981. Nesting biology of the White-winged Scoter. Journal of Wildlife Management 45: 38–45.

Cramp, S. & Simmons, K.E.L. 1977. Handbook of the Birds of Europe, the Middle East, and North Africa; the Birds of the Western Palearctic, Volume 1: Ostrich-Ducks. Oxford University Press, Oxford, UK.

Dagys, M. 2016. Species status report for Velvet Scoter *Melanitta fusca*: West Siberia & Northern Europe/NW European Population. LIFE Project: Coordinated Efforts for International Species Recovery Euro SAP. Report commissioned by the European Commission Directorate General for the Environment. Lithuanian Ornithological Society, Vilnius, Lithuania.

Donehower, C. E., & Bird, D. M. (2008). Gull Predation and Breeding Success of Common Eiders on Stratton Island, Maine. Waterbirds, 31(3), 454–462. doi:10.1675/1524-4695-31.3.454

Flint V.E., Boehme R.L., Kostin I. V., Kuznetsov, A.A. 1968. Птицы СССР [Birds of CCCP]. Moscow.

Gavashelishvili, L., Gokhelasvili, R., Javakhishvili, Z. & Tarknishvili, D. 2005. A Birdwatching Guide to Georgia, with Information on Other Wildlife. Georgian Center for the Conservation of Wildlife and Buneba Print Publications, Tbilisi, Georgia.

Janashvili A., Kutubidze L., Zarkua D. 1960. Georgian Bird Mirror, Tbilisi University Press.

Kutubidze, M.E. 1985. The Guide to the Birds of Georgia. Tbilisi State University, Tbilisi, Georgia.



- Matcharashvili, I., Arabuli, G., Darchiashvili, G. & Gorgadze, G. 2004. Javakheti Wetlands: Biodiversity and Conservation. NACRES, Tbilisi, Georgia.
- Mikola, J., Miettinen, M., Lehikoinen, E. & Lehtilä, K. 1994. The effects of disturbance caused by boating on survival and behaviour of velvet scoter *Melanitta fusca* ducklings. *Biological Conservation* 67: 119–124.
- Paposhvili N. 2018. The status of Velvet Scoter *Melanitta fusca* breeding in Georgia. *Wildfowl* 68: 183-192.
- Paposhvili N. 2020. Supporting the conservation of Velvet Scoter at Lake Tabatskuri by determining the direct causes of the Scoters' poor reproductive success. Final Evaluation Report for the Rufford Foundation.
- Traylor, J.J., Alisauskas, R.T. & Kehoe, F.P. 2004. Nesting ecology of white-winged scoters (*Melanitta fusca deglandi*) at Redberry Lake, Saskatchewan. *Auk* 121: 950–962.
- Traylor, J.J. & Alisauskas, R.T., 2006. Effects of Intrinsic and Extrinsic Factors on Survival of White-Winged Scoter (*Melanitta fusca deglandi*) Ducklings. *Auk* 123: 67–81.
- Wetlands International. 2012. Waterbird Population Estimates: Fifth Edition. Summary Report. Edited by Taej Mundkur and Szabolcs Nagy. Wetlands International, Wageningen, the Netherlands.
- Zhordania, R.G., Boehme, R.L., Kuznetsov, A.A. 1999. Птицы Грузии. Полевой определитель [The birds of Georgia. A field guide] Tbilisi.