Greater scaup

Aythya marila

Northern Ireland only

BASC's evidence review and recommendations for sustainable shooting

2023-2028 Recommendation

Show restraint, targeted research and conservation effort required

BASC

The British Association for Shooting & Conservation

Greater scaup - BASC recommendation

Show restraint, targeted research and conservation effort required.

Research required

- Wintering surveys to better understand local and national distribution and abundance.
- Submission of bag data is required to better inform harvest estimates (data can be submitted to GWCT National Gamebag Census or BASC Green Shoots Bagged It).
- Shooters should support the BASC wing survey to enable better understanding of adult:juvenile and male:female harvest ratios.
- Increased ringing, ring resighting, and ring recovery reporting required.

Shooting restrictions

- Should show restraint.
- Site-based considerations required.

Habitat management

- Maintenance or restoration of large water habitats, either coastal or freshwater, to provide optimum feeding and roosting environments comprising of deep water (1m to 5m).
- Minimise impacts on the sea bed/lake bed to ensure availability of suitable foraging.

Stage 2 assessment

Aythya marila - Greater scaup - applies to Northern Ireland only

Species summary

Greater scaup (herein scaup), is a migratory diving duck found across large parts of the Northern Hemisphere. The north-eastern flyway population overwinter in the UK from Iceland, and historically Russia and Fennoscandia, rarely breeding in the UK[1–3]. Previously high population sizes in the mid-late 1900's have declined substantially, resulting in an unfavourable conservation status across Europe[1,4–6]. In the UK, this decline in wintering population size has been driven predominantly by short-stopping of birds from Russia and Fennoscandia[7].

In both North America and Europe, drivers of decline in the species remain unclear and may be linked to climate, predation, density or a combination of these factors[7–9]. The majority of scaup-focussed evidence is based on North American populations and identifies a decline in female survival and recruitment[10,11], however drivers are somewhat unclear and these studies must be interpreted with caution. Research within flyway-relevant populations identifies bycatch from fisheries as the main human-mediated driver of mortality.

Species conservation status (see Table 1)

Scaup show a 54% decline overall in the UK over the last 10 years (2010/11-2020/21)[6]. This is driven by declines in wintering populations in N Ireland (-76%), England (-36%) and Scotland (-29%) during this time period. However, the Welsh population appears to be increasing (+24%) after a 25-year decline of -93%. These declines are shared across the continent of Europe[5]. However, the North-western flyway population appears to be increasing and remains a substantial size[2]. The global population remains large but is showing a decline thought to be driven by changes in human activity and climate change[3].

	BoCC[12] (2020)	**IUCN UK**[12] (2020)	**Europe**[5] (2021)	**EU28**[5] (2021)	**AEWA**[13] (2018)	**IUCN Global** (Last updated in 2018)
Category	**R**	**EN**	**LC**	**EN**	**C1**	**LC**
Trend (time period in brackets)	**Decreasing**[6] (2010/11-2020/21)		**Decreasing** (over 3 generations)	**Decreasing** (over 3 generations)	**Increasing** (2009-2018)	**Decreasing** (over 3 generations)
Population size estimate Mature individuals	**Breeding:** n/a **Wintering:** 6,400 Individuals[14]		96,400-170,000 (min-max)	2,100-3,000 (min-max)	240,000-280,000 (min-max)	4,920,000-5,130,000
Reason for category	Severe non-breeding pop decline over longer term; Moderate non-breeding pop decline over 25yrs; non-breeding localisation	Reduction in the size (either abundance or range) of the non-breeding pop of 20-30% over 3 generations	n/a	Population reduction of >50% in 3 generations. Causes of reduction may not be understood or have ceased. Population fewer than 2,500 mature individuals showing decline of >20% in 3 generations.	Pop. numbering over ~100,000 individuals that could significantly benefit from international cooperation but do not show rapid or long-term declines, range contractions, major habitat threats or are data deficient.	n/a
WeBS UK 10-year trend (2008/09-2018/19): -54%[15] • BBS UK 10-year trend (2010-2020): n/a**						

Table 1. Species conservation status across different scales. *It has been highlighted by BASC that such automatic linkage between IUCN status and levels of protection by AEWA is directly contrary to the IUCN's advice on the use of its list. **No Breeding Bird Survey data (BBS) due to Scaup primarily being an over-wintering species in the UK.

Population dynamics

The European population is demonstrating a north-eastern shift, likely driven by climate change and the appearance of more appropriate wintering habitat nearer to breeding grounds[7]. As a result, parts of the Baltic Sea are now key overwintering sites[7,16]. The overwintering populations of scaup in the UK, Ireland and the Netherlands have declined in the last 30 years due to this short-stopping, particularly by the Russian and Fennoscandian populations[7]. The UK and Ireland now predominantly host the over-wintering Icelandic population, therefore the mixing of Russian and Icelandic birds may become even more reduced with time, creating distinct geographic populations[7]. This shift, combined with inadequate conservation measures in new overwintering sites in central Europe, is posing a significant threat to the population at large[7]. Scaup, like many other waterbirds, demonstrate an uneven sex ratio with a male bias[17]. Population compositions in Northern Ireland also suggest differential migration, with females often migrating further south to winter[18].

Scaup often form mixed flocks with tufted duck A. fuligula and pochard A.ferina during migration and wintering[19]. BTO ringing data suggests the species is relatively short-lived (typically live three years, breeding in year two), with an adult survival of less than 50% therefore it is likely that reproductive output (as opposed to adult survival) plays an important role in population dynamics.

Hunting and harvest

Scaup shooting seasons in Northern Ireland are compliant with the Key Concepts of Article 7(4)[20]. There are no current or historical bag number estimates published for scaup. Therefore, it is difficult to determine the level of hunting pressure or estimate a Sustainable Harvest Index (SHI) which has been done for more common waterbird quarry[21]. Scaup can only be hunted in ten EU Member States[3]. Limited research suggests harvest has a negligible impact on the population as a whole[3,10]. Like many other waterbirds, scaup are susceptible lead shot ingestion, therefore the continued use of non-toxic shot will benefit the species[22]. North American studies find little evidence that harvest pressure is driving declines in greater and lesser scaup, however lower female survival and poor recruitment are contributing factors[9–11]. It is important to note that these studies focus on North American populations and the same processes may not be in play within the European flyways.

Pressures, action and research

Pressures

Scaup predominantly feed at night in shallow coastal or brackish water but will winter inland near to the coast[1,7,19]. These areas are subject to commercial and recreational activities and by-catch by commercial fisheries is a limiting factor for many diving duck populations in Europe[3,7,16,23]. Other fishing activity such as dredging impacts scaup food resource availability in key sites[7]. Due to a predominantly shellfish-centric diet, the species is also vulnerable to changes in water quality[24]. Distribution of wintering birds has also shown to be correlated with food availability and distribution[4]. Historically, scaup numbers were boosted by cockle harvesting in Scotland, but declined following its cessation[4]. In parts of their European distribution, scaup depend on zebra mussels (a non-native) for food. There is therefore a trade off between invasive species eradication and supporting

wintering waterfowl[19]. As with other diving ducks, feeding near water treatment discharge was common and more recent improvements in water quality may have contributed to population declines[1]. Scaup are also susceptible to avian influenza and due to large inter-continental movements may play a role in the spread of the disease[25]. The impact of climate change on both breeding and overwintering habitat are suggested to impact survival and productivity of scaup due to varying weather conditions (i.e. snow cover) and food availability[3,7,9]. As a late-nesting species, the reduced flexibility of scaup to adjust their timing of breeding makes them more susceptible to such changes[26].

Practical action

Preservation and protection of breeding grounds and key wintering grounds in northern Europe are key[3,27]. Since scaup also display and form pair bonds at wintering sites, adequate food resources are important for the population at these non-breeding sites prior to return migration[19]. Limiting fishing operations in areas with high overwintering diving duck numbers would reduce bycatch and entanglement[16,23]. Up-to-date species management plans are required for SPA's where the species occurs[7]. Scaup are bottom-feeding divers therefore reducing disturbance to the floor of waterbodies (especially 1-5m in depth) encourages the retention of prey such as bivalves or chironomid larvae[19].

Research action

An increase in bag data from the UK will enable a greater understanding of the Icelandic flyway population composition. This may allow for drivers of scaup declines to be better understood. Increased tagging and ringing research may provide further data on short-stopping behaviour and potential segregation of Icelandic and Russian/Fennoscandian birds[1].

References

1. Kirby, J. S., Evans, R. J. & Fox, A. D. Wintering seaducks in Britian and Ireland: populations, threats, conservation and research priorities. Aquat Conserv 3, 105–137 (1993).
2. Wetlands International. Waterbird Populations Portal. wpp.wetlands.org (2022).
3. BirdLife International. Aythya Marila. The IUCN Red List of Threatened Species 2018 e.T22680398A132525108. http://dx.doi.org/10.2305/IUCN.UK.2018- (2018) doi:10.2305/IUCN.UK.2018.
4. Quinn, J. L., Still, L., Carrier, M. C., Kirby, J. S. & Lambdon, P. Scaup Aythya marila numbers and the Cockle Cardium edule fishery on the Solway Firth: are they related? Wildfowl 47, 187–194 (1996).
5. BirdLife International. European Red List of Birds. https://op.europa.eu/en/publications. (2021) doi:10.2779/967570.
6. Austin, G. E. et al. Waterbirds in the UK 2021/22: The Wetland Bird Survey and Goose & Swan Monitoring Programme. . (2023).
7. Marchowski, D. et al. Effectiveness of the European Natura 2000 network to sustain a specialist wintering waterbird population in the face of climate change. Sci Rep 10, (2020).
8. Ross, B. & Devink, J.-M. Combined effects of climate, predation, and density dependence on Greater and Lesser Scaup population dynamics. Ecological Applications 25, 1606–1617 (2015).
9. Tatman, N. M. et al. Tatman et al 2009 - nest success and duckling survival of greater scaup in New Brunswick. The Canadian Field Naturalist 123, 323–328 (2009).
10. Afton, A. D. & Anderson, M. G. Declining Scaup Populations: A Retrospective Analysis of Long-Term Population and Harvest Survey Data. J Wildl Manage 65, 781–796 (2001).
11. Austin, J. E. et al. Declining Scaup Populations: Issues, Hypotheses, and Research Needs. Wildl Soc Bull 28, 254–263 (2000).
12. Stanbury, A. et al. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114, 723–747 (2021).
13. AEWA. Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) - Agreement Text and Annexes As Amended by MOP8. (2022).
14. Woodward, I. et al. APEP 4: Population estimates of birds in Great Britain and the United Kingdom. British Birds 113, 69–104 (2020).
15. Frost, T. M. et al. Waterbirds in the UK 2019/20: The Wetland Bird Survey. (2021).
16. Marchowski, D. & Leitner, M. Conservation implications of extraordinary Greater Scaup (Aythya marila) concentrations in the Odra Estuary, Poland. Condor 121, (2019).
17. Sotherland, P. R. & Rahn, H. On the composition of bird eggs. Condor 89, 48–65 (1987).
18. Evans, D. M. & Day, K. R. Migration patterns and sex ratios of diving ducks wintering in Northern Ireland with specific reference to Lough Neagh. Ringing and Migration 20, 358–363 (2001).
19. Marchowski, D. et al. The importance of non-native prey, the zebra mussel Dreissena polymorpha, for the declining greater scaup Aythya marila: A case study at a key European staging and wintering site. PLoS One 10, (2015).
20. Key Concepts of Article 7(4) of Directive 79/409/EEC: Period of Reproduction and Prenuptial Migration of Annex II Bird Species in the 28 Member States. (2014).
21. Ellis, M. B. & Cameron, T. C. An initial assessment of the sustainability of waterbird harvest in the United Kingdom. Journal of Applied Ecology 59, 2839–2848 (2022).
22. Demendi, M. & Petrie, S. A. Shot Ingestion in Scaup on the Lower Great Lakes After Nontoxic Shot Regulations in Canada. Wildl Soc Bull 34, 1101–1106 (2006).
23. Marchowski, D., Jankowiak, Ł., Ławicki, Ł., Wysocki, D. & Chylarecki, P. Fishery bycatch is among the most important threats to the European population of Greater Scaup Aythya marila. Bird Conserv Int 30, 176–193 (2020).
24. Cervencl, A. & Alvarez Fernandez, S. Winter distribution of Greater Scaup Aythya marila in relation to available food resources. J Sea Res 73, 41–48 (2012).
25. Spaulding, F., Mclaughlin, J. F., Glenn, T. C. & Winker, K. Estimating movement rates between Eurasian and North American birds that are vectors of avian influenza. Avian Dis 66, 155–164 (2022).
26. Drever, M. C. et al. Population vulnerability to climate change linked to timing of breeding in boreal ducks. Glob Chang Biol 18, 480–492 (2012).
27. Fox, A. D. et al. Current and Potential Threats to Nordic Duck Populations — a Horizon Scanning Exercise. Annales Zoologici Fennici vol. 52 (2015).