Swan News

Issue no. 14
August 2018

Newsletter of the Wetlands International / IUCN SSC Swan Specialist Group

About the Swan Specialist Group

The Wetlands International / IUCN SSC Swan Specialist Group (SSG) is a global network of over 400 swan specialists from 38 countries who undertake monitoring, research, conservation and management of swan populations.

The SSG strives to facilitate effective communication between members and others with an interest in swan management and conservation world-wide, in order to improve national and international links for cooperative research, to identify gaps in knowledge and to provide a forum for addressing swan conservation issues.

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Citation: Mitchell, C.D. & Rees, E.C. (eds). 2018 *Swan News issue no 14 / August 2018*. Newsletter of the Wetlands International / IUCN SSC Swan Specialist Group. 40pp.

Contents

Editorial

Welcome to *Swan News* 14, the latest issue of the annual newsletter of the Wetlands International / IUCN Species Survival Commission Swan Specialist Group (SSG).

Thanks to our members, we once again have a variety of articles and updates dealing with various aspects of swan biology, ecology, behaviour and conservation. In addition, we have news of the recently revised and expanded SSG website, and an announcement of the 6th International Swan Symposium.

I hope that many of you can attend the 6th International Swan Symposium. Travel in these times is expensive, and often uncomfortable and unpleasant. However these international meetings are excellent opportunities for individuals to meet, exchange data, information and ideas, interact personally, and develop new partnerships and approaches. Please do try to attend.

The articles, project updates and news herein remind us that swan conservation involves more than just research into biological, ecological and ethological factors; the results of research need to be applied through management and conservation programmes. Information from studies made of swan species therefore should be communicated to relevant stakeholders including conservation organisations, developers, government agencies, and policy makers, as well as to the general public.

In addition to the contributing authors, the team at WWT who turns the raw text into an attractive and readable newsletter deserves your appreciation and thanks. I certainly appreciate everyone's contributions. Please do provide us with any feedback.

Lastly, as another field season begins, I think that those of us who still get to conduct field research, and to spend time in wetlands and with swans (not forgetting all the other wetland wildlife) should take a moment to remember how lucky we are to be able to experience these environments and wildlife at close quarters. We get to actually do things others only dream of. Try to remember that when the data aren't coming easily (or at all), or the biting insects are about to drive you mad, or when everything leaks and you're wet and cold. We are extraordinarily fortunate to be able to work out-of-doors in fascinating habitats and with one of the most interesting birds on the planet.

I hope you enjoy reading and learning from this issue.

Best wishes to you all for a productive and successful field season.

Carl D. Mitchell

Whooper Swans in Iceland (photo: Sacha Dench / WWT).

"Atte the leest, he hath his holsom walk, and mery at ease, a swete ayre of the sweete savoure of the meede flowres that makyth hym hongry; he hereth the melodyous armony of fowles; he seeth the yonge swannes, heerons, duckes, cotes, and many other fowles, wyth thyr. Brodes…"

Dame Juliana Berners,
"*A Treatyse of Fysshynge Wyth an Angle*", 1496.

Announcements

Sixth International Swan Symposium

Following on from the five previous international symposia of the Wetlands International/IUCN-SSC Swan Specialist Group, held at:

- Slimbridge (Gloucestershire, UK, in December 1971)
- Sapporo (Hokkaido, Japan, in February 1980)
- Oxford (Oxfordshire, UK, in December 1989)
- Airlie (Virginia, USA, February 2001)
- Easton (Maryland, USA, February 2014)

we are delighted to announce that the 6th International Swan Symposium will be held at the Estonian University of Life Sciences, Tartu, Estonia, from 15–19 October 2018.

The programme can be found on the conference website (**http://conference.emu.ee/en/conferences/swan2018/**). The full registration fee includes not only the conference banquet but a 1-day mid-conference excursion to swan staging sites in eastern Estonia. On the last day of the meeting there will be a workshop on the implementation of the AEWA Single Species Action Plan developed for the NW European Bewick's Swan population (the only swan population thought to be in decline), with presentations reviewing progress to date, an assessment of priority actions still be addressed, and discussion on how best to take these forward. The Action Plan is available on-line at: **http://www.unep-aewa.org/sites/default/files/publication/ts44_ssap_bewicks_swan.pdf**.

A post-conference excursion to Estonia's amazing wetlands, which host thousands of migratory Bewick's Swans and Whooper Swans each year (to include the internationally renowned Matsalu Bay Ramsar site), is scheduled for 20–22 October 2018.

Further information, with registration details, is available on the conference website. Meanwhile please note the following dates in your diaries:

- Deadline for final registration: 1 October 2018.
- 6th International Swan Symposium: 15–19 October 2018 (including arrival on 15 October).
- Post-conference excursions: 20–21 October 2018.

We are already looking forward to seeing you at the meeting!

Research projects and updates

Bewick's Swans and their winter food resources in southeast England

Kevin A. Wood, Julia L. Newth, Kane Brides, Geoff M. Hilton & Eileen C. Rees

Regular readers of the Swan Specialist Group Newsletter will know that winter numbers of the Northwest European Bewick's Swan *Cygnus columbianus bewickii* population declined by almost 40% between 1995 and 2010 (Rees & Beekman 2010; Nagy *et al.* 2012). In response to this substantial, long-term decline, the population has also been reclassified as endangered on the European Red List of Birds (BirdLife International 2015). To determine the causes and potential solutions for the decline, an international species action plan (the Bewick's Swan Single Species Action Plan: BSSAP) was developed for the population and was adopted by the African-Eurasian Waterbird Agreement (AEWA) in 2012 (Nagy *et al.* 2012).

In an earlier study, the apparent survival rates for Bewick's Swans of all age classes were found to have declined since the 1980s, with a particularly large drop from winter 2008/09 onward (Wood *et al.* 2018a). In contrast, there was no evidence for a long-term trend in Bewick's Swan breeding success between the 1960s and 2010s, either in the percentage of juveniles within the population each year or in the mean brood sizes recorded for swans wintering in the UK (Wood *et al.* 2016). Thus changing survival, rather than productivity is believed to have had the greatest influence on the observed changes in population size, and in particular the recent decrease in numbers. The underlying reasons for the reductions in both survival and population size are currently unknown, but the BSSAP calls for assessments of whether suboptimal feeding conditions at wintering sites are influencing demographic rates and contributing to the decline in population size (Nagy *et al.* 2012), and such studies may help to provide some insight into the situation.

As part of our long-term research into Bewick's Swans at the Wildfowl & Wetlands Trust, we're therefore currently undertaking a series of analyses to assess Bewick's Swans use of their food resources at key sites on the winter grounds in Britain. This work is currently focused on the Ouse Washes in southeast England, which in recent decades has supported up to 38% of the total flyway population wintering in northwest Europe, but will also include other key sites around Britain. Bewick's Swans feed almost exclusively on terrestrial food resources at these sites, on agricultural crops such as wheat *Triticum* sp.,

Figure 1. A flock of swans using an early-growth wheat field on the Ouse Washes during winter (photo: Kevin Wood).

Oilseed Rape *Brassica napus* and pasture grasses (*e.g.* Ryegrass *Lolium perenne*) as well as the unharvested remains of Sugar Beet *Beta vulgaris*, Potatoes *Solanum tuberosum*, and Maize *Zea mays* (Figure 1).

Many winter sites vary between years in terms of the quantity and diversity of food resources that are available to the birds. There is a widespread perception that the availability of some crop types, *e.g.* Sugar Beet, has become lower in recent years, whilst other crop types such as Oilseed Rape and Maize have become more widespread. Therefore, our analyses will combine information on food resources within the landscape with long-term data on swan numbers, habitat use, behaviour, and measures of body condition, to examine whether changes in food type and availability have affected the Bewick's Swans' use of their key wintering sites. The long-term monitoring carried out by WWT and partners means that we have data going back to the 1960s with which to address these questions (Figure 2a,b). A recent analysis of long-term trends in the body condition for Bewick's Swans, for birds of known parentage to control for any cohort effects, however found no evidence of a connection between the decline in population size and the swans' body condition (Wood *et al.* 2018b).

In contrast to falling Bewick's Swan numbers, many sites in northwest Europe have seen numbers of Whooper Swans *Cygnus cygnus* and Mute Swans *Cygnus olor* rise in recent years. We are currently undertaking research to examine whether interspecific competition between Bewick's Swans and the two larger swan species could be affecting trends in site use by Bewick's Swans. Long-term data on swan distributions around the Ouse Washes will allow us to

a)

b)

Figure 2. Bewick's Swans being measured during swan catches at Slimbridge, southwest England by (a) Mary Evans during the 1970s, and (b) Kevin Wood during the 2000s (photos: Joe Blossom and Kane Brides).

test for any temporal shifts in habitat use that might indicate displacement of Bewick's Swans by the larger species. Detailed time-activity budget data collected over the last three winters will be used to assess whether Bewick's Swans show altered behaviour (*e.g.* lower foraging or higher vigilance) or increased energy expenditure when in mixed-species flocks with Whooper or Mute Swans.

Finally, to allow us to make predictions about future trends at winter sites, we are developing an individual-based model (IBM) of the three swan species on the Ouse Washes. IBMs, also known as agent-based models, are simulation models that can predict the movement and resource-use of individuals within a landscape (Wood *et al.* 2015). Predictions are based on fitness-maximising behavioural rules (*e.g.* "always feed in the most profitable location"), rather than statistical relationships which are only valid within a limited data range, and so IBMs can yield accurate predictions even as the environment changes dramatically. For these reasons, IBMs are considered to be powerful tools for predicting how individuals and populations will respond to changes in their environment, and have been used to inform the conservation of a range of waterbird species (Wood et *al.* 2015). The data needed to build and test our model have been gathered from fieldwork carried out between winters 2015/16 and 2017/18, together with existing field data, and the extensive literature on swan ecology. Once validated against field data, we will use our IBM to predict how future changes in land management and competition with the larger swan species could affect Bewick's Swan body condition, habitat use, survival, and numbers.

Collectively, these analyses will allow us to test comprehensively whether the food resources available to Bewick's Swans are adequate, both now and in the near future. We look forward to presenting our findings in future issues of the Swan Specialist Group Newsletter.

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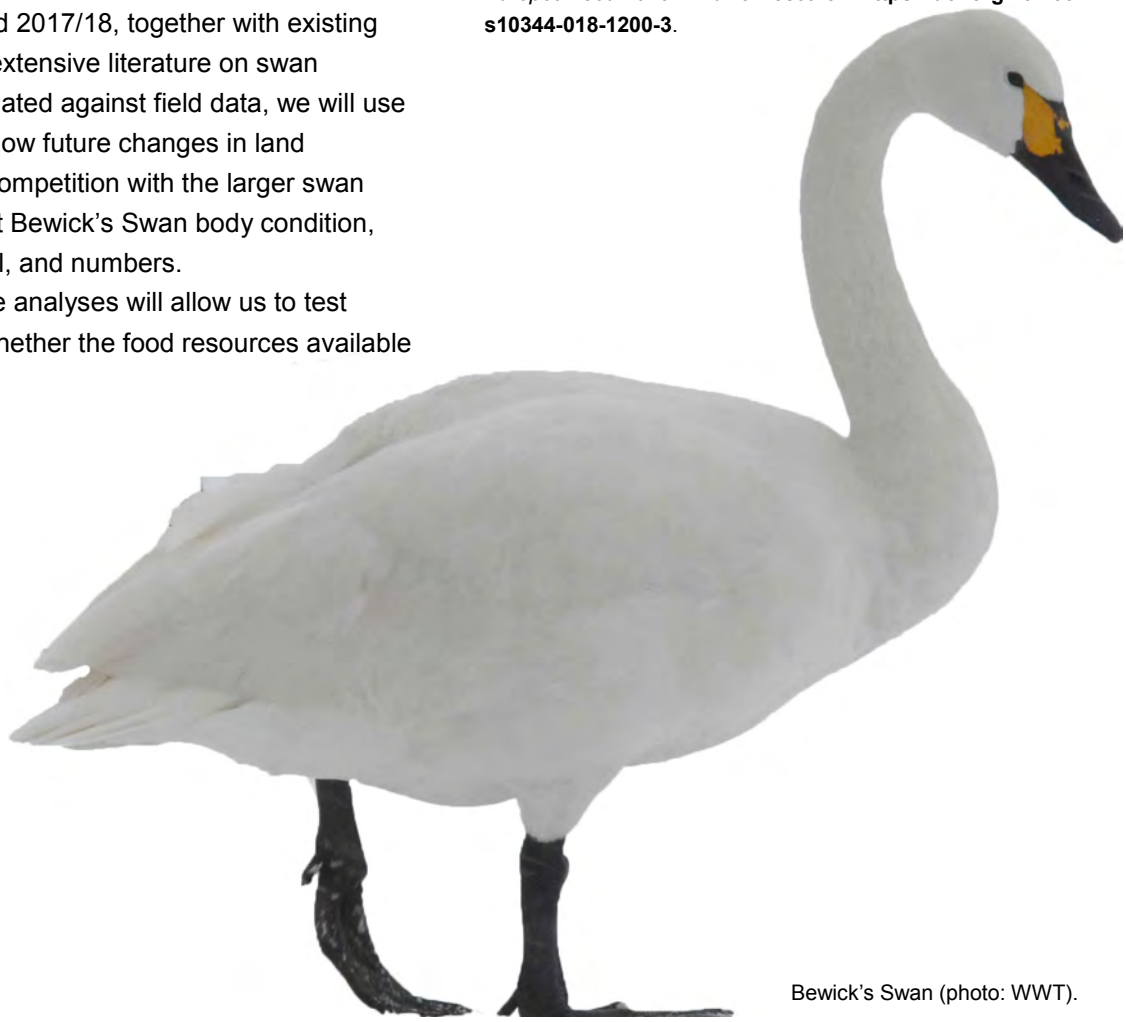

Bewick's Swan (photo: WWT).

Mute Swans (photo: Nick Stacey / WWT).

The capture and field euthanasia of non-native Mute Swans at Chesapeake Bay, Maryland, USA

Larry J. Hindman, William F. Harvey IV, Hutchison R. Walbridge, Mark Hooper & Cindy P. Driscoll

The Mute Swan *Cygnus olor* is native to Eurasia but was introduced to North America during the 20th century, where local breeding populations are now widespread and increasing in certain parts of the United States and southern Ontario (Ciaranca *et al.* 1997; Petrie & Francis 2003; Baldassarre 2014). The increasing numbers of Mute Swans have led to concerns regarding the ecological impacts, resulting in some management agencies in the United States implementing control efforts directed at reducing populations of this non-native species. In Maryland the Mute Swan population originated from the escape of five captive birds in 1962 (Reese 1975), after which numbers grew slowly through the 1960s and 1970s but then underwent rapid growth from 264 swans in 1986 to 3,955 by 1999 (Hindman & Harvey 2004). In Chesapeake Bay, abandonment of nesting areas by state-threatened waterbirds (*e.g.* the Least Tern *Sternula antillarum* and Black Skimmer *Rynchops niger*; Therres & Brinker 2004) has been ascribed to Mute Swans, and large flocks of non-breeding swans have also reduced submerged aquatic vegetation at the local level (Tatu *et al.* 2007).

Because Mute Swans are considered invasive species by state and federal wildlife management agencies, some limited population control efforts have aimed at slowing population growth (Ciaranca *et al.* 1997, Atlantic Flyway Council 2003), and in 2003 the Maryland Department of Natural Resources (MDNR) adopted a Mute Swan Management Plan in order to reduce the state's Mute Swan population to protect ecological resources at Chesapeake Bay. Population control actions were delayed by negotiations with the Humane Society of the United States and legal challenges from animal rights organisations, but in 2004 the U.S. Congress passed the Migratory Bird Treaty Reform Act (MBTRA), which stipulated that protection of birds under the Migratory Bird Treaty Act (MBTA) only applies to migratory species that are native to the U.S., and also directed the U.S. Fish and Wildlife Service to prepare a list of non-native species to which the act does not apply (Tatu 2006). The list was finalised on 15 March 2005 and Mute Swans were included. Thus, in July 2005, the MDNR initiated an integrated control strategy aimed at eliminating all Mute Swans from areas designated as "swan free areas" and initially reducing the state's Mute Swan population to < 500 birds by 2008 (MDNR 2003). The strategy used a combination of nest and egg destruction (Hindman *et al.* 2014) and the culling of adult swans using shooting and live capture with euthanasia. In 2011, the MDNR revised its Mute Swan

Figure 1. Distal end of telescopic, aluminium swan pole (3.2-cm crook gap) made of marine-grade aluminium rod (0.6 cm) used to capture flightless mute swans in the lower Potomac River and upper Chesapeake Bay, Maryland, USA, 2005–2008.

management plan to include a population objective of reducing the swan population to as few as possible (MDNR 2011).

To remove large numbers of Mute Swans from the Maryland portion of Chesapeake Bay, we developed a field live-capture technique deployed while the birds were flightless during their annual mid-summer moult. In Britain, family groups of wild Mute Swans have been caught and marked for centuries to denote ownership (by the Crown or a corporation), or more recently for ringing, during a ceremonial activity known as swan-upping (Scott 1972; Birkhead & Perrins 1986). The flightless birds are surrounded by several small boats, for capture by hand, landing net or swan pole, or for herding into temporary pens erected on the shore. In the U.S., small numbers of flightless Mute Swans have also been captured for marking studies, or to remove "nuisance" birds or to assist the re-establishment of Trumpeter Swan *Cygnus buccinator* populations, by pursuing them with a boat and catching them with a large fish-landing net (Reese 1975; Gelston & Wood 1972; Sousa 2005). In 1995, we attempted (unsuccessfully) to capture 150–200 flightless Mute Swans by herding them with boats towards shore and into onshore capture pens, but the birds avoided capture by dispersing as individuals or as small groups (3–10 birds).

For the large-scale control of Mute Swans at Chesapeake Bay we therefore used a modified design of the British swan pole (Minton 1968; Figure 1) to catch birds from boats, rather than aiming to herd them. We also deployed a rapid, effective, and humane field method of euthanasia for swans in the field. Aerial surveys were used to locate moulting sites, and we then used live capture and euthanasia to remove swans from moulting areas where culling by shooting using 12-gauge shotguns was inappropriate because of the proximity to waterfront residential homes. Individuals were caught from a boat using a modified aluminium telescopic swan pole (*c.* 2.4 m fully extended, with a smooth, rounded hook or "shepherd's crook" at one end), placed quickly around a swan's neck so that the bird could be pulled toward the person making the capture and lifted into the boat. The bird was then immediately euthanized by mechanical cervical dislocation, using a 48 cm emasculatome, and the carcass placed in a plastic bag for transport and disposal. Mechanical cervical dislocation using this tool has been recommended as a field method of euthanasia and farm culling for large birds (Franson 1999; Canadian Council on Animal Care 2009). We used the American Veterinary Medical Association (AVMA) guidelines for the euthanasia of wildlife and consulted with veterinarians to ensure that the field techniques used for culling swans was humane (AVMA 2000, 2007). The entire process from time of capture until a single bird was humanely killed and then stored for transport averaged about 30 seconds.

During the summers of 2005–2008, we captured and euthanized 1,396 Mute Swans from moulting flocks in 24 operations. Swans culled per operation ranged from 6–199 with an average cull rate of 32 swans per hour. Our capture method frequently resulted in removal of all flightless Mute Swans in the area. Cost was $40,259 for the 24 field operations. Mean cost per swan culled (including disposal) was $28.84. We used this method as part of an integrated control programme, which also included egg oiling (to reduce recruitment to the population) and shooting of adult swans (2002–2014), that resulted in a reduction of Maryland's Mute Swan population from 3,995 in 1999 to 41 in 2014.

A full report on this work has been published, so further information is available in:

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Mute Swans (photo: Steve Nicholls / WWT)..

Tracking movements of Trumpeter Swans in Iowa, USA

Tyler M. Harms & Stephen J. Dinsmore

Prior to European settlement, the Trumpeter Swan *Cygnus buccinator* was common in Iowa and nested throughout the state. However, by 1883, this iconic bird was extirpated from the state largely due to unregulated hunting and habitat destruction for agricultural development (Iowa Department of Natural Resources [IDNR] 2016). In 1993, the IDNR initiated a restoration programme with a goal of re-establishing 15 nesting pairs to Iowa by 2003. In 1998, the first wild pair of Trumpeter Swans in more than 100 years successfully nested in eastern Iowa, a success that would continue to 1999 and 2000. By 2010, the IDNR recorded a total of 42 nesting pairs of Trumpeter Swans in Iowa. Yet despite accomplishing the aim of restoring breeding Trumpeter Swans to Iowa, little is known about the movements of these birds within Iowa and beyond. Historic information from banding efforts indicated that some of Iowa's Trumpeter Swans regularly migrate to Kansas, Missouri and Minnesota, with some travelling as far as Oklahoma and Arkansas (IDNR 2016). We therefore used GPS tracking devices (fitted to swans using neck-collars) to monitor the year-round movement of Trumpeter Swans in Iowa, in order to provide an opportunity for Iowa State University Ornithology students to learn data analysis techniques for ornithological research, and to inform the public about Trumpeter Swan movements and ecology. Additionally, the information gained from the study was considered potentially useful to wildlife managers interested in obtaining a more detailed understanding of Trumpeter Swan ecology and habitat requirements.

In cooperation with the IDNR, we captured nine juvenile Trumpeter Swans in Iowa between 18 August and 7 September 2017. Each swan was caught at a different location and only one juvenile swan was taken from a single family group to maintain independence among our study animals. We determined the sex of each captured swan and fitted each with a Wild

Figure 1. GPS Transmitter neck-band used on Trumpeter Swans in Iowa.

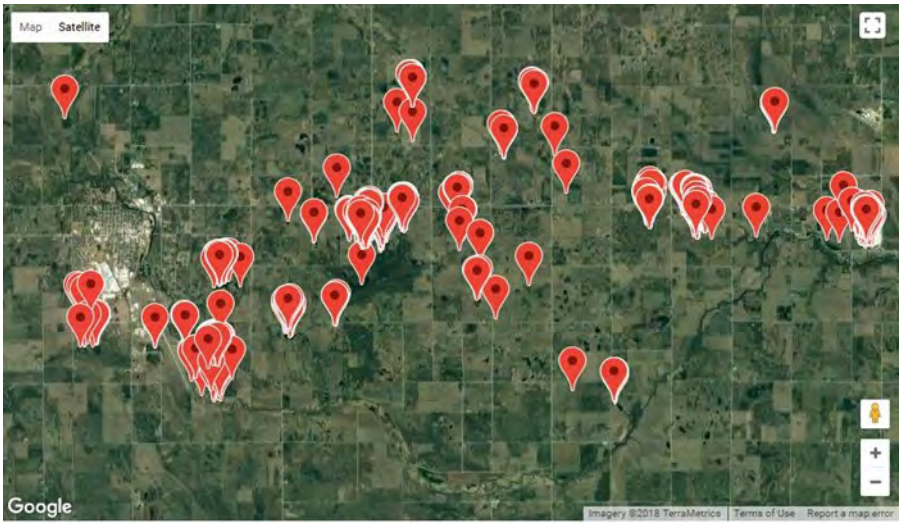

Figure 2. Sample map of Trumpeter Swan locations in Iowa, USA.

Tracker WT-300s (swan) GPS neck-collar (KoEco Inc.; Figure 1). The GPS collars were programmed to record a location every hour from 05:00–21:00 h and once at 24:00 h, and had a lifespan of approximately two years. We downloaded location data from each collar remotely each week and uploaded data to a publicly-accessible website so citizens could track Trumpeter Swan movements throughout the duration of the project. Preliminary data analyses were conducted by Iowa State University Ornithology students in February 2018 as part of a class exercise.

During the study we collected a total of 6,763 location points from seven swans prior to swan mortality or collar malfunction (*e.g.* Figure 2). Two collars failed to record any location points. We confirmed mortality for two of the nine collared swans (22%). The number of points collected by each collar ranged from 499–1,979 prior to swan mortality or collar failure. One swan was recorded at a wintering site in Arkansas, which was the longest distance travelled of any of our collared swans. Unfortunately its collar malfunctioned, so we did not obtain data on the migration path taken by this bird. Its presence in Arkansas was confirmed with the assistance of local birdwatchers and photographers, as well as by the Arkansas Game and Fish Commission and The Trumpeter Swan Society.

Preliminary data analyses conducted by ornithology students found the average distance travelled by juvenile swans between roost and feeding locations was 647.75 m (s.d. ± 1,381.72) overall and that the distance from roost to feeding locations increased with age in both males and females. Students also found that juvenile swans tended to feed in areas with a greater amounts of water than any other habitat types (*e.g.* wetlands, forests and crops).

Additional data analyses will be conducted by a second group of students in spring 2019. We also plan to re-deploy 2–4 refurbished collars in summer 2018 for additional data collection, and will maintain the public website for continued outreach and education.

For more information about the project, please visit the website: **https://www.nrem.iastate.edu/track-trumpeter.**

Acknowledgements

We would like to thank the following individuals and organisations for financial support of this project: Iowa State University Trumpeter Swan Restoration Committee, The Trumpeter Swan Society, Carolyn J. Fischer, Blank Park Zoo, Chickasaw County Conservation Board, and the Friends of Union Slough National Wildlife Refuge. We are also grateful for website support from the Iowa State University Biology IT group and logistical support from the Iowa Department of Natural Resources and U.S. Fish and Wildlife Service Union Slough National Wildlife Refuge.

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North American Trumpeter Swan Survey data analyses

Carl D. Mitchell

In the last newsletter (*Swan News* 13, page 6), I mentioned my hopes for a more rigorous analysis of the North American Trumpeter Swan Survey data. It is too early to be certain anything will come of it, but I have been discussing the concept with Dr. Rebecca Taylor, of the U.S. Geological Survey, Alaska Science Center. While much can be learned from different analyses of the existing Quinquennial Survey data, I am currently compiling datasets for sites and years surveyed not only during but also between the Quinquennial Surveys. These will supplement the Quinquennial Survey results and possibly provide a better understanding of the Quinquennial Surveys by accounting for interim productivity and survival patterns at different temporal and spatial scales. Once we see what data we have to supplement the Quinquennial Surveys, we will prepare a proposal for funding.

Spring ice conditions at Swan Haven, Yukon, Canada: is there change in the past 30 years?

Jim Hawkings

Swan Haven is a popular spring swan-viewing and interpretation facility located at M'Clintock Bay on Marsh Lake, Yukon Territory, in northwest Canada. A significant portion of the Pacific Coast Population of Trumpeter Swans *Cygnus buccinator* stop to rest and feed here during April and early May, on their way north to breeding grounds in western Yukon and Alaska. The migration area is located 40 km southeast of Whitehorse at the outlet of Marsh Lake, one of the Yukon's large southern lakes. Here a rich shallow-water feeding area on the delta of the M'Clintock River is juxtaposed with the outflow of the Yukon River from Marsh Lake. Open water is present throughout all but the coldest winter weather, and expands rapidly in the early spring, well in advance of melting in any other wetlands suitable for waterfowl. The swans and other waterfowl feed on the natural crop of submerged aquatic vegetation that is available as ice slowly melts on the shallow water and mudflats of the delta.

This part of North America is subject to quite rapid climate change according to the climate change experts, and it begs the question of how this changing climate may alter the conditions for spring migrants, primarily Trumpeter Swans and Tundra Swans Cygnus *c. columbianus* and a wide variety of ducks and other waterbirds.

See what you think by looking at a series of oblique aerial photographs of this migration area taken on the same dates (24 April and 8 May) each year since 1986 at the following website:

https://jimhawkings.smugmug.com/Aerial-survey-photos/Spring/Selected-Photos-by-Area/MClintock-Bay-all/April-all.

Most photos are taken from the same attitude and aspect. In this time-series you will see a lot of variation, but it's difficult to see an absolutely obvious trend. Of course there are many factors at play here as winter gives way to spring: air temperature, water temperature, water level and flow, winter snow accumulation, wind. How does this compare to trends in similar migration areas around the northern hemisphere?

Acknowledgements

I thank Canadian Wildlife Service and Lighthawk for supporting this aerial photography over the past 30 years.

Trumpeter Swan (photo: Richard Sonnen, courtesy of The Trumpeter Swan Society).

Trumpeter Swan–White-tailed Deer winter feeding interactions on the Deer Parks Wildlife Mitigation Unit

Paul Faulkner

The Deer Parks Wildlife Mitigation Unit is a wildlife mitigation project near the confluence of the Henry's Fork and Upper Snake Rivers, and the property is managed by the Idaho Department of Fish and Game (hereinafter Department) for the benefit of wildlife. A sharecrop agreement between the Department and a local farmer is in place for 400+ acres of irrigated crops. The Department takes its share of the crops as standing small grain cereals left unharvested in the fields, which provide food for wildlife over the winter period.

In the two severe winters of 2011 and 2017 deep snow covered the standing crops, and in 2011 a crust formed on the surface of the snow (Figure 1a,b).

Normally the grain would not be available to the swans under these conditions, but White-tailed Deer *Odocoileus virginianus* were observed pawing through the snow to feed on the grain, with the deer breaking through the snow crust and creating small craters. Trumpeter Swans *Cygnus buccinators* took advantage of the broken snow crust to feed on the uncovered grain. Moreover, having consumed the accessible grain, the swans dug tunnels into the sides of the craters, and ducks borrowed even further under the snow to reach more of the snow-covered grain (Figure 2a,b). Once again, swans and other waterbirds show how adaptable they can be.

Figure 1. Snow covering a grain field in (a) March 2011, and (b) January 2017.

Figure 2. Feeding tunnels in (a) March 2011, and (b) January 2017.

Comparing manned aerial surveys and unmanned aerial systems for Trumpeter Swan nest surveys

Todd Preston

There were four main objectives in evaluating Small Unmanned Aircraft System (sUAS) technology for conducting Trumpeter Swan *Cygnus buccinator* surveys in the Southeast Idaho National Wildlife Refuge Complex:

1. Establish whether the sUAS flights found all the same nests as the manned aircraft, and determining if the sUAS GPS locations are more accurate than the manned flights.
2. Determine the cost/time ratio for the two procedures, in order to compare the amount spent using the different techniques.
3. Document wildlife disturbance incurred from both methods and determine if one is less invasive than the other.
4. Create a high resolution digital elevation model (DEM) of Trumpeter Swan nesting habitat to facilitate hemi-marsh management.

The sUAS flights at the SEID Refuge Complex clearly demonstrated that this technology is suitable for conducting aerial surveys of Trumpeter Swans. In particular, the sUAS flights provided increased nest accuracy and more accurate cygnet counts relative to traditional manned flights. The sUAS flights were less cost effective than the manned flights and required more time to complete; however, the sUAS flights produced additional data, namely video, digital photographs, and georeferenced orthoimagery, that were not produced from the manned flights. This type of data could be collected from manned flights, but would greatly increase the cost and time of traditional surveys. For example, manned flights are currently conducted with approximately 0.5 mile transect spacings; however, to get the overlap (*c.* 66%) on the still images required to make the orthoimagery, sUAS transects were spaced at *c.* 50 m and 90 m in 2015 and 2016, respectively. If the manned flights were conducted in a similar fashion, this would increase the number of transects required to cover a 1 mile strip from 2 to *c.* 18 using a similar camera set-up as the 2016 sUAS flights. If orthoimagery was not required from future sUAS flights and nest locations and swan counts were conducted manually, the transect spacing could be greatly increased which would reduce flight time and costs. The additional imagery and data provided by the sUAS flights will provide refuge staff with archived data to evaluate changes in nesting territories, especially if hydrological regime changes are incorporated into management plans. Future orthoimagery at the SEID Complex would provide additional data for comparing temporal changes in nesting territories.

While the sUAS flights were less cost effective than the manned flights, sUAS technology continues to improve which could make future surveys more cost competitive. This was clearly shown between the 2015 and 2016 flights. During 2015, flights with Raven RQ-11A were flown at 400 ft. AGL and covered an area of 271 ha per flight hour. The flights in 2016 using the Falcon Unmanned were flown at 800 ft. AGL and covered an area of 796 ha per flight hour. While the USGS has been instrumental in developing the Department of the Interior's sUAS programme, other Agencies are becoming involved. Training refuge staff to become sUAS pilots would allow the U.S. Fish & Wildlife Service (USFWS) to conduct flights more frequently and may not require additional funding if incorporated into regular staff duties.

Editor's note

A pdf of the final report on this experiment can be obtained from the Editor (**mitch@silverstar.com**).

Expedition reports

Bewick's Swan ringing expedition to Arctic Russia

Kane Brides & Hannah Robson

In August 2017, a team from the Wildfowl & Wetlands Trust (WWT) and University College London (UCL) joined Russian colleagues on an expedition to the Russian tundra to catch and colour-ring Bewick's Swans Cygnus *columbianus bewickii.* This work forms part of a long-term study of the species, with re-sightings of ringed swans enabling further information to be collected on the movements, site fidelity, breeding success and survival of individual birds.

The aim of the trip was to catch and ring as many Bewick's Swans as possible in the time available, to increase the number of individuals that could subsequently be identified in the field. Over nine days, the team travelled by boat to areas frequented by Bewick's Swans during their annual moult, specifically focussing on flocks and non-breeding pairs. In total, 86 Bewick's Swans were captured and colour-marked with yellow and white leg-rings. Each bird also had various body size measurements taken to assess its health and condition. A smaller number of Whooper Swans were ringed with yellow leg-rings and several Mute Swans were also caught and marked with blue neck-collars.

During the trip, WWT and UCL scientists also visited 30 lakes used by the swans, taking water chemistry measurements. Eighteen lake sediment cores were also taken from selected sites. Analysis of these samples will provide detailed information on environmental change in the region, and thus potentially highlight issues important to the swans, such as changes in habitat and/or food supply.

The expedition would not have been possible without the help and active participation of Russian colleagues from the Nenetskiy Nature Reserve, who have been protecting this important breeding and moulting area for the swans and many other waterbird species since the area was designated as a National Nature Reserve (known as a "zapovednik") by the Russian Government in 1997.

Birders are encouraged to check flocks of Bewick's Swans for any colour-marks and report these to **colourmarkedswans@wwt.org.uk** along with details on the location, date, habitat type, flock count and information on associating partners and/or cygnets. These data are invaluable for analyses to assess the conservation status of the Bewick's Swan, as well as for keeping track of particular swans who have become "old friends" over the years, and we are grateful to all observers who report ring sightings to us.

Catching Bewick's Swans for ringing in the Russian arctic, summer 2017 (photos: Ben Cherry/WWT).

Observations of Bewick's Swans at the Evros Delta, in Greece and Turkey, in February 2017

Helmut Eggers

Abstract

Various publications have reported on the increase in Bewick's Swan *Cygnus c. bewickii* use of the Evros Delta in recent years, in the border area between Turkey and Greece. The aim of a visit to this area in February 2017 was to obtain further information about the origin of the swans overwintering there, by observing flocks carefully to determine the number of neck-collared and leg-ringed birds present at the site. Despite intensive observations made on both sides of the border, no ringed birds were detected between 17–22 February 2017. Age counts found 22.0% cygnets in the Bewick's Swan flocks.

Survey area and study period

The Evros Delta is a wetland of international importance for waterbirds and other species on the border between Greece and Turkey.

On the Greek side, the area is characterised by large lagoons, canals, islands and grassland, is strictly protected as a National Park, and is managed by the Evros Delta Management Authority. A visitor centre provides an environmental education service and guided tours. There are several observation towers in the area from which one can easily see the most important areas, facilitating counts of birds using these parts of the reserve.

On the Turkish side, the area is mainly put to agricultural use, with rice fields being characteristic of the area on this side of the border. The area extends primarily between the villages of Yenikarpuzlu and Enez where, in addition to the paddy fields, there are also smaller and larger bodies of water which serve as resting and roost sites for the swans.

Observations were made from 17–22 February 2017, mainly on the Turkish side. Since it is mostly a military area with restricted access, the birds were sometimes difficult to see. Also, dams between the fields sometimes were not passable, so that counts could only be made from longer distances. In such cases, it was usually not possible to determine the proportion of young in the flock or to check for marked birds.

Expedition team

The observations were carried out by Gerthold Günther (from Bantin), Jochen Steinberger (Drönnewitz) and Helmut Eggers (Lübtheen).

Daily observations

February 17th 2017: Rice fields between Yenikarpuzlu and Enez, Turkey

On this day, three flocks were counted from the road between Yenikarpuzlu and Enez. A large group of 1,087 individuals was supplemented by 65 Whooper Swans *Cygnus cygnus*. Two smaller groups with 234 and 205 Bewick's Swans were also observed in the immediate vicinity of the road. The flock of 234 Bewick's Swans also included 6 Whoopers and 16 Mute Swans. The group with 205 Bewick's Swans, which was mainly comprised of Whooper Swans (405 birds) and Mute Swans *Cygnus olor* (360 birds), was in a completely dammed-up (flooded) field, so we could check only for neck-collars. For the first two groups we were also able to look for leg-rings because water levels were low or non-existent.

Other flocks seen on this day were less easy to observe and differentiation was not always certain, but any neck-collars would probably have been noticed. One group was of 550 Bewick's Swans, *c*. 400 Whooper Swans and *c.* 1,250 Mute Swans. The largest flock consisted of 3,005 Bewick's Swans, 170 Whooper Swans and 75 Mute Swans. Most of the Bewick's Swans in this group could be checked for the presence of neck-collars, and to a small extent also for leg-rings. Another flock of about *c.* 700 Mute Swans was also recorded.

The vast majority of the Bewick's Swans fly in the evening to roost in the nature conservation area on the Greek side of the delta. The lagoons there provide roost sites calmer than the hunting areas used on the Turkish side. Hunting is supposedly limited by the local authority to one day per week, but we also heard shots on other days. Bewick's Swans therefore roost primarily in the undisturbed areas of the national park on the Greek side of the delta and feed in the rice fields on the Turkish side during the day. There are exceptions, however, in that we also found a flock of 750 Bewick's Swans at a roost site close to the Enez – Yenikarpuzlu road on 17 February 2017.

In total, 5,081 Bewick's Swans were found in the Turkish part of the Evros Delta on 17th February 2017, with 750 individuals seen at roost (Table 1). As the roosting swans were presumably from flocks counted in the area earlier in the day, these individuals were not

Table 1. Daily observations of Bewick's Swans on the Evros Delta, February 2018. TR = Turkey; GR = Greece.

Date	Country	Place name	Total	Adult	Juvenile	% Juvenile
17/02/2017	TR	Yenikarpuzlu	1,087	921	166	15.3
			234	170	64	27.4
			205	164	41	20.0
		Enez	550			
			3,005			
Daily total	**TR**		**5,081**			
At roost	**TR**	**Enez**	**750**	624	126	**16.8**
18/02/2017	TR	Enez	160			
		Yenikarpuzlu	45	38	7	15.6
Daily total	**TR**		**205**			
19/02/2017	GR	Peloukia Lagoon	473	365	108	22.3
			216	157	59	27.3
			268			
		Nymphon Lake	393	290	103	26.2
			790			
Daily total	**GR**		**2,140**			
21/02/2017	TR	Enez	103			
			476	354	122	25.6
			770	565	215	27.9
Daily total	**TR**		**1349**			
22/02/2017	TR	Yenikarpuzlu	250			
	GR	Drana Lagoon	230			
		Peloukia Lagoon	51	32	19	37.2
			71	47	24	33.8
Daily total	**TR**		**250**			
	GR		**351**			
24/02/2017	GR	Kerkini Lake	10	10		0
Daily total	**GR**		**10**			

Bewick's Swans (photo: Alec Taylor / WWT).

added to the daily total. Of the 5,081 swans observed, 1,526 were aged to determine the proportion of juveniles, and 17.8% were found to be cygnets. The flock of 750 swans seen at roost included 16.8% young.

February 18th 2017: Waters near Karpuzlu, Turkey

On February 18th 2017 we searched extensively in the Evros lowlands on the Turkish side of the border and found that Bewick's Swans occurred almost exclusively in the areas checked between Karpuzlu and Enez the previous day. We saw only a group of 160 Bewick's Swans (not aged) on a reservoir in the Karpuzlu area, plus 45 Bewick's swans in rice fields southwest of Yenikarpuzlu.

February 19th 2017: Evros Delta National Park, Greece

Observations on February 19th were made on the Greek side of the delta, with and support from the Greek National Park Administration. Viewing conditions were good, so that in many cases it was possible to determine the proportion of young.

No Bewick's Swans were found at the Drana Lagoon. In contrast, 689 Bewick's Swans were counted, sitting in small groups along the shoreline of the Paloukia Lagoon, including 167 (24.2%) cygnets. A further 268 individuals could not be aged with certainty because they were more distant. In total, 957 Bewick's swans were counted in the Paloukia Lagoon.

Some 393 Bewick's Swans observed at Nymphon Lake were all close enough to age and included 26.2% cygnets. A further 790 Bewick's swans counted on the lake were also checked for neck-collars but none were found.

Overall, a total of 2,140 Bewick's Swans were counted in the Greek part of the Evros Delta during the day (Table 1), with 86 Whoopers and 13 Mute Swans also recorded at Paloukia Lagoon.

February 21st 2017: Yenikarpuzlu – Enez area, Turkey

No Bewick's Swans were present in the Yenikarpuzlu rice fields on this day, but 610 Mute Swans and 40 Whooper Swans were counted, and a further 18 Mute Swans and 5 Whooper Swans were found to the southwest.

A group of 476 Bewick's Swans were seen in the rice fields along the road heading towards Enez, of which 25.6% were cygnets. At 10:00 h we saw a steady influx of small groups from the west, probably from roost sites beyond the Turkish–Greek border.

In the paddy fields before Enez we again found 650 Whooper Swans and Mute Swans. Then also in Enez 770 Bewick's Swans were counted including 215 (27.9%) cygnets, a relatively high proportion of juveniles. Family sizes were determined for this group, which had not been possible elsewhere due to viewing conditions. Of the 215 juveniles counted, 183 were assigned to 71 families. Brood sizes were of 11 x 1 cygnet, 23 x 2 cygnets, 25 x 3, 10 x 4, 1 x 5 and 1 x 6 cygnets, with an average brood size of 2.58 young for this sample.

Table 2. Proportion of young in Bewick's Swan flocks on the Evros Delta in February 2017. TR = Turkey; GR = Greece.

Date	Country	Total aged	No. adults	No. juveniles	% Juveniles
17/02/2017	TR	2,276	1,879	397	17.4
18/02/2017	TR	45	38	7	15.6
19/02/2017	GR	1,082	812	270	25.0
21/02/2017	TR	1,256	919	337	26.8
22/02/2017	GR	122	79	43	35.2
Overall		**4,781**	**3,727**	**1,054**	**22.0**

Bewick's Swan (photo: Richard Taylor-Jones / WWT).

February 22nd 2017: Yenikarpuzlu area and Greek Evros Delta National Park

About 250 Bewick's Swans were seen in the Yenikarpuzlu rice fields during the morning, with a further *c.* 1,500 Mute Swans and 350 Whooper Swans present in the area.

In the afternoon, 250 Bewick's Swans were counted at the Drana Lagoon in the Evros Delta National Park in Greece, with a further 121 including 43 (35.5%) young on the Paloukia Lagoon. The highest proportion of young therefore was found in this small group, perhaps due to the swans already beginning to migrate. Overall, 22.0% cygnets were recorded in 4,781 Bewick's Swan aged during the study period (Table 2).

For completeness, a sighting of 10 Bewick's Swans at Kerkini Lake in Greece (NW of the Evros Delta) on 24 February 2017 should be mentioned. The entire lake was searched for swans.

Discussion

In February 2017, the Evros Delta area was visited over several days to observe Bewick's Swans wintering at the site. Flocks were observed as intensively as possible over a 5-day period, with the focus being on birds which visited the Turkish part of the delta. This area is predominantly agricultural, with extensive rice fields flooded to different levels. The fields are crossed by channels of variable width and meandering waters. Larger lakes – the Galu Golu, the Sigirci Golu and the silted Pamuklu Golu – are also located in the vicinity. The swans mostly fed in rice fields, where food was available, during the day. For roost sites, however, the birds predominantly used lagoons on the Greek side of the delta, evident from their morning and evening flights (with much vocalization) across the border.

The extent to which hunting for waterfowl in the Turkish part of the delta influences the swans' use of the site has not been studied in any detail but is worth considering. The hunting of swans is forbidden, and we were told that waterfowl hunting is allowed only one day a week, but during our visit hunting activity was heard clearly on different days. The whole area is covered with hunting facilities in the form of huts, or simple screens/blinds on the dams or in the fields. Eight swan carcasses were discovered during a tour of the paddy fields at the dams near Yenikarpuzlu. Although closer examination to determine the cause of death was not possible due to the inaccessibility of the sites, it seems likely that swans were hunted here.

Viewing conditions were not optimal, especially on the Turkish side where access is to a large extent restricted because of a military area close to the border. We were controlled by military patrols on several occasions. Certain areas near the border (i.e. near the River Evros) therefore were not visited or could only be scanned at long distances, and in many cases it was not possible to make age assessments for the flocks. Searching for leg-ringed birds also was not always possible in these areas, but checks for neck-collars were undertaken for almost all groups. It was possible to look for leg-ringed individuals as well as neck-collared birds in the flocks in rice fields seen along the road between Yenikarpuzlu and Enez on 17 and 21 February because the surfaces were only flat dammed or dry. The proportion of young was also determined on these dates. Despite the very intensive observations no marked Bewick's Swans (neither neck-collared nor leg-ringed birds) were found.

The total number of Bewick's Swans occurring in the Evros Delta is difficult to determine because only coordinated counts on both sides of the border can provide concrete data. Whether coordinated counts have ever been undertaken is unclear. The 5,081 Bewick's Swans counted on 17 February 2017 were on the Turkish side only, but the count is indicative of the numbers of this species occurring in the Evros Delta, and concurs with numbers reported by D. Vangeleuwe who gave an estimated total of 8,400 Bewick's Swans at the site in February 2016 (see odnature.naturalsciences.be/bebirds/en/blog_swans 5.2.2016), when a swan with a yellow neck-collar was also observed.

The high percentage of young birds among the Bewick's Swans on the Evros Delta is noteworthy, with 1,054 (22.0%) cygnets among 4,781 Bewick's Swans age-checked during our visit. The proportion of juveniles was much lower in Bewick's Swan flocks elsewhere in NW Europe during winter 2016/17, with 10.5% young in 2,998 aged counted in Germany in December 2016 (A. Degen, pers. comm.) and 16.5% young in 1,816 individuals aged in the UK (WWT Waterbird Monitoring, accessible at **https://monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/species-accounts/bewicks-swan/**). The high proportion of juveniles among the Evros-wintering swans suggests that their origins differ from those occurring elsewhere in Europe, at least for a large proportion of the swans using the site. Marking programmes with corresponding re-sighting effort and further telemetry studies would provide better insight into the life-cycles of these birds.

Observations of Bewick's Swans in southwest Siberia, Russia

Alexander Solokha

Abstract

Bewick's Swans *Cygnus columbianus bewickii* have been very rarely recorded in the southern part of the Urals and Western Siberia. In recent decades there have been no reliable visual records from this area. In October 2015, 2016 and 2017 we conducted waterfowl counts at some wetlands in the Kurgan (2015), Tyumen (2016) and Novosibirsk (2017) regions. All sites were located in the steppe and forest-steppe zones. Binoculars and 20–60x spotting scopes were used for observations and to count the birds. Bewick's Swans were found in the Kurgan and Novosibirsk Oblasts, but not in Tyumen.

Field observations

Kurgan Region. Field surveys were carried out in Kurtamysh District, 30–50 km south of Kurgan (54°32'N, 64°21'E) from 9–15 October 2015. Bewick's Swans were found at three lakes and we observed them every day from 10–14 October 2015.

On 10 October, 53 Bewick's Swans (35 adults; 18 juveniles) were present at Great Gor'koye Lake. The local ranger reported *c.* 12 Bewick's Swans (4 adults; 8 juveniles) on 11 October, but may have missed the others. On 12 October we counted a total of 60 Bewick's Swans (39 adults; 21 juveniles) at the site, separated into three groups. During our last visit to the lake (on 14 October), eight adult Bewick's Swans were recorded.

The second site, Grachinoye Lake, was 15 km to the northeast of Great Gor'koye Lake. Here, on the outskirts of Ostrova village, we observed a big mixed congregation of waterfowl including 44 Bewick's Swans (33 adults; 11 juveniles) on 11 October. Apart from the Bewick's Swans there were also 182 Whooper Swans *Cygnus cygnus,* five Mute Swans *Cygnus olor* and eight White-fronted Geese *Anser albifrons albifrons*, as well as many Wigeons *Anas penelope* and domestic geese *Anser anser domesticus*. Like other birds in this flock, the Bewick's Swans appeared unafraid of people.

The third site was Great Donki Lake. On 13 October, we observed two flocks of Bewick's Swans flying at a height of 30–40 m over the lake. The first group of 22 adult Bewick's Swans moved southward in direction of Great Gor'koye Lake; the second group of 12 birds (of which three or four were juveniles) flew to the west.

On the basis of these observations, we suggest that the first and second sites held different birds, while the Bewick's Swans seen at Great Donki Lake might belong to either the first or second groups. Thus, at least 104 Bewick's Swans were observed at stopover sites in Kurtamysh District between 10–14 October 2015. Of these, 72 were adults and 32 (30.8%) were juveniles.

Tyumen Region. During 11–20 October 2016 we visited wetland and agricultural sites in the southeastern part of Tyumen Region (Sladkovsky District; 55°32'N, 70°20'E). No Bewick's Swan was found in the area.

Novosibirsk Region. The field survey from 10–19 October 2017 covered the southeast part of the region, focusing on Chistoozyorny District (54o43'N, 76o35'E). Bewick's Swans were recorded on two occasions. On 15 October we saw five Bewick's Swans (3 adults; 2 juveniles) at Repino Lake in Chistoozyorny District, and on 16 October we found two adult Bewick's Swans at Cheryomushnoye Lake, Chanovsky District.

Acknowledgements

The field trips were organised in cooperation with the Wildlife and Hunting Departments of the Kurgan, Tyumen and Novosibirsk regions. I wish to thank all local specialists who helped me in searching for and counting Bewick's Swans and other waterbirds.

Papers

Whooper Swans foraging on fruit in Japan

Tetsuo Shimada

Abstract

Although swans are a vegetarian species, foraging on fruit is uncommon particularly in winter. Here, I report that one adult and two juvenile of a family were seen feeding on the Japanese Persimmons *Diospyros kaki* on 22 November 2017.

Introduction

The Whooper Swan *Cygnus cygnus* is essentially a vegetarian; its diet ranges from freshwater and marine algae and aquatic vegetation, to terrestrial plants and agricultural crops. Animal matter is less frequently ingested, but the swans have been reported taking invertebrates, freshwater molluscs, aquatic insects, fish eggs refuse and carrion (Brazil 2010).

I had an opportunity to observe swans foraging on Japanese Persimmons when the tree bore fruit in November 2017. The observations are presented here as a further contribution to our knowledge of the Whooper Swan's diet.

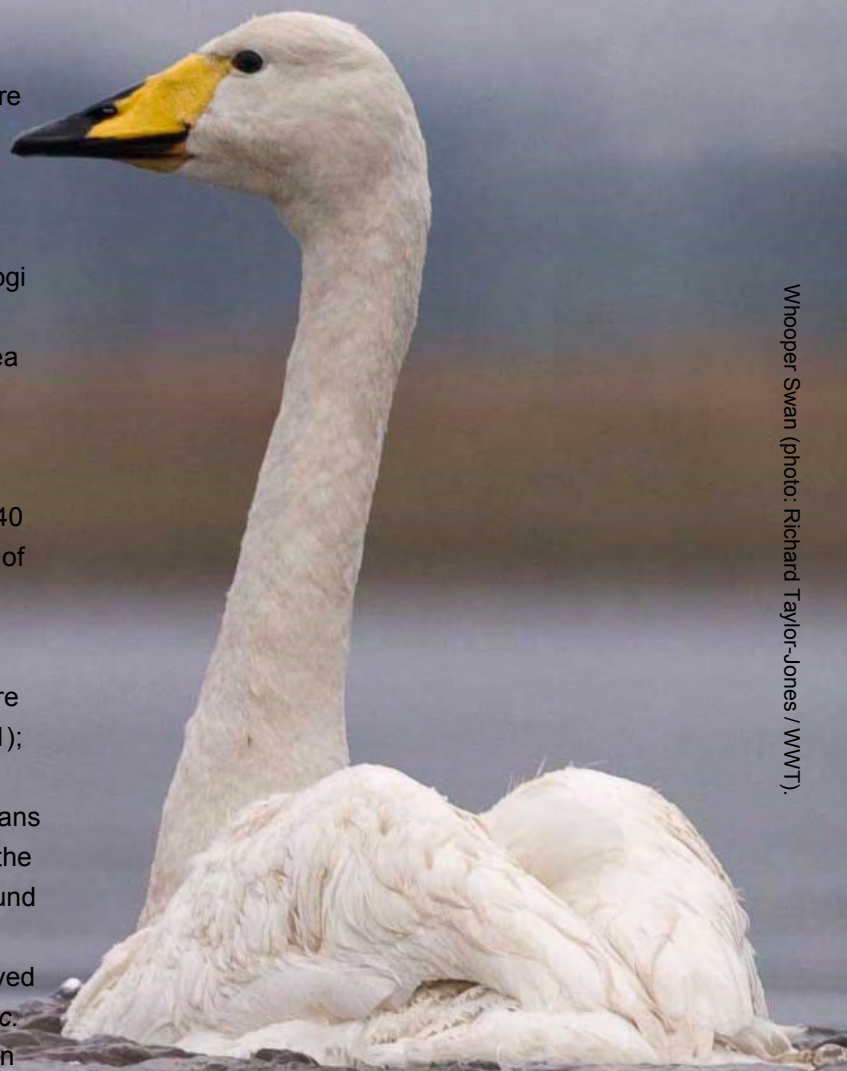
Methods

Field observations were conducted at Lake Teshirogi (5.6 ha in area; 37°59'N, 140°44'E) in Kakuda City, Miyagi Prefecture, Japan, a well-known wintering area for wildfowl which supports Whooper Swans, Mallard *Anas platyrhynchos* and Northern Pintail *A. acuta*. Swans were seen feeding on Japanese Persimmons during the morning of 22 November 2017. A total of 40 swans and ducks were recorded at the site that day, of which 10 were Whooper Swans.

Results and discussion

One adult and two juveniles of the same family were seen feeding on the Japanese Persimmons (Figure 1); a second adult nearby, apparently also a family member, was not observed taking the fruit. Other swans roosting at the site moved in the early morning from the lake to a rice field; the family also left the lake at around 08:00 h.

Some 200–250 Whooper Swans have been observed at Lake Teshirogi during the winter season, but only *c.* 10 swans assembled under the Japanese Persimmon tree (H. Kano pers. comm.). Japanese Persimmons can



Whooper Swan (photo: Richard Taylor-Jones / WWT).

be either sweet or sour in taste. The sour-tasting fruits gradually change to a sweet flavour and soften as they ripen and finally fall from the tree. The Whooper Swans did not feed on what were presumably sour and hard fruits after pecking at them a little (H. Kano pers. comm.). When they were unable to access more palatable fruits even on stretching their neck, they waited until they fell from the tree.

In Japan, it is well known that Brown-eared Bulbuls *Hypsipetes amaurotis* and White-cheeked Starlings *Sturnus cineraceus* flock in early winter to the few fruits remaining on persimmon trees (Higuchi 2014). Common Coot *Fulica atra* have also been observed foraging on them in the lake (Figure. 2). However, this feeding behaviour has not previously been recorded for Whooper Swans. It seems that these particular Whooper Swans, seen foraging on Japanese Persimmons, had some knowledge of time at which they ripened. This knowledge may now be transmitted from parents to juveniles.

Acknowledgements

I express sincere thanks to H. Kano for providing critical information. I also thank the editors for their helpful comments.

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Figure 1. Whooper Swans foraging on Japanese Persimmons (photo: H. Kano).

Figure 2. Common Coot foraging on Japanese Persimmons (photo: H. Kano).

Figure 1. A Bewick's swan with its cygnet (photo: WWT).

Championing Bewick's Swans in the Russian Arctic

Julia L. Newth, Anna Belousova, Petr Glazov, Sergey Uvarov, Sergei Kanyukov, Sacha Dench, Kevin A. Wood & Eileen C. Rees

Every summer, the Russian Arctic provides refuge for the Northwest European population of the Bewick's Swan *Cygnus columbianus bewickii* (Figure 1).The expansive tundra wetlands form a critical component of their annual life-cycle, allowing a space to moult, feed, rest and breed. Although the Bewick's Swan is legally protected from hunting under legislation, it remains at risk from shooting throughout its migratory range with 31% of live-caught swans x-rayed between winters 1970/71 and 2008/09 found to have shotgun pellets embedded in their tissues (Mineyev & Mineyev 2014; Newth *et al.* 2011). International co-operation has led to efforts by conservationists to reduce hunting across the flyway, an action identified as a high priority in the Bewick's Swan Single Species Action Plan adopted by the African-Eurasian Migratory Waterbird Agreement (Nagy *et al.* 2012).

In Russia, efforts are underway to evidence and understand the issue and plan activities to reduce the poaching of Bewick's swans and other protected waterbirds. Dialogue and surveys with local communities in the Nenets Autonomous Okrug and Arkhangelsk Oblast have helped identify several motivations for hunting Bewick's swans. These include a lack of enforcement of protective laws, food, sport, their arrival in the spring coinciding with the open hunting season, a perception that numbers are increasing/too high, a perception that they have a negative impact on other breeding waterbirds and a lack of awareness that they are protected (18% of hunters were unaware of their legal protection). Only 14% of hunters could visually distinguish Bewick's swans from two other swan species that reside in the region, Whooper Swans *Cygnus cygnus* and Mute Swans *Cygnus olor*, both of which are afforded weaker legal protection within Russia. Additionally, there was concern from participants about the perceived negative impact of hunting tourism on protected species. A total of 91% of respondents believed that it was important to maintain Bewick's swans in the arctic landscape for future generations.

Multi-disciplinary and participatory approaches have brought a range of interested parties together, including conservation organisations, indigenous

associations, regional government bodies, tourism agencies, educators and local museums. In March 2018, a workshop in Nar'Yan-Mar was held to discuss ways in which poaching could be reduced and Bewick's Swans and their critical wetland habitats could be championed (Figure 2). With such a diverse range of participants, there was an abundance of creative and novel ideas, and an inspiring, collective desire to make a difference. Plans include visual and interactive guides which will help hunters to identify protected and huntable species, educational resources so that young people can learn about migratory waterbirds and wetlands (*e.g.* Figure 3), a travelling swan art exhibition which will be taken to remote villages and an international hunter exchange programme so that knowledge and experiences of best hunting practices can be shared. A Swan Champion Coordinator has been appointed and a regional working group will be established to take forward these activities.

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Figure 2. Workshop delegates (photo: Nenetskiy zapovednik).

Figure 3. Celebrating the Bewick's Swan for World Migratory Birds Day (photo: Nenetskiy zapovednik).

Tundra Swans and alternative energy development on Lake St. Clair, Ontario, Canada

K.H.A. Weaver, Scott A. Petrie, S.E. Richman, M.D. Palumbo, M.E. Dyson, P. Briscoe & T.S. Barney

Figure 1. Tundra Swans, agricultural fields and wind turbines.

The lakeshore and coastal wetlands at Lake St. Clair provide critically important habitat for waterfowl, yet continue to face wetland drainage and conversion for anthropogenic purposes. One recent change in the region that may be impacting waterfowl is the construction of thousands of industrial wind turbines (IWTs) along the lakeshore and adjacent to coastal wetlands. The rapidity with which IWT developments are being proposed and constructed in Ontario raises concerns about the potential impacts on waterfowl and other wildlife. Some species, such as raptors, passerines, Monarch Butterflies *Danaus plexippus* and bats, have difficulty avoiding IWT rotors and can suffer considerable collision mortality. While collision mortality does occur in waterfowl, European studies indicate that ducks, geese and swans tend to avoid IWTs in aquatic and terrestrial habitats. In fact, some European studies have determined that waterfowl rarely occur within 150m from IWTs and have identified this 300 m (diameter) area as an “Exclusion Zone”, with the birds also showing reduced use of areas 500 m from the turbines identified as a 1 km diameter “Avoidance Zone”. Therefore, IWTs constructed at a suitable distance from important waterfowl habitats are considered unlikely to have significant impacts on migratory movements or foraging habitats for waterfowl. However, when IWTs are constructed close to coastal wetlands, in closely associated and traditionally used agricultural fields, or in shallow offshore waters, it is possible that waterfowl habitats could be compromised.

Currently, Ontario regulations and guidelines require that IWTs cannot be placed within 550 m from human habitations and within 120 m of significant wildlife habitat. There is also a moratorium on offshore IWT development in Ontario, but this could change in the near future. Biologists have suggested that IWTs must be located away from sensitive natural habitats, including wetlands and important migratory corridors, foraging habitat, and known daily movement flyways between roosting and feeding areas. However, if a Natural Heritage Assessment is completed and the results are favourable, Ontario currently permits the placement of IWTs in Important Bird Areas (IBAs). For example, Lake St. Clair currently has 22 IWTs active in the Eastern Lake St. Clair IBA, many of which are within 120 m of coastal wetlands. Given the above guidelines, the chosen placement for IWTs is often in agricultural fields. Unfortunately, flocks of staging and wintering ducks, geese and swans use these agricultural fields and avoidance of IWTs may reduce food accessibility. As there has been little research done in Canada to determine the impacts of IWTs on habitat use or movements of staging or wintering waterfowl, the continued construction of IWTs at Lake St. Clair is of concern for waterfowl in the region.

As of mid-2014, there were 941 IWTs constructed, approved and proposed for Essex and Kent Counties

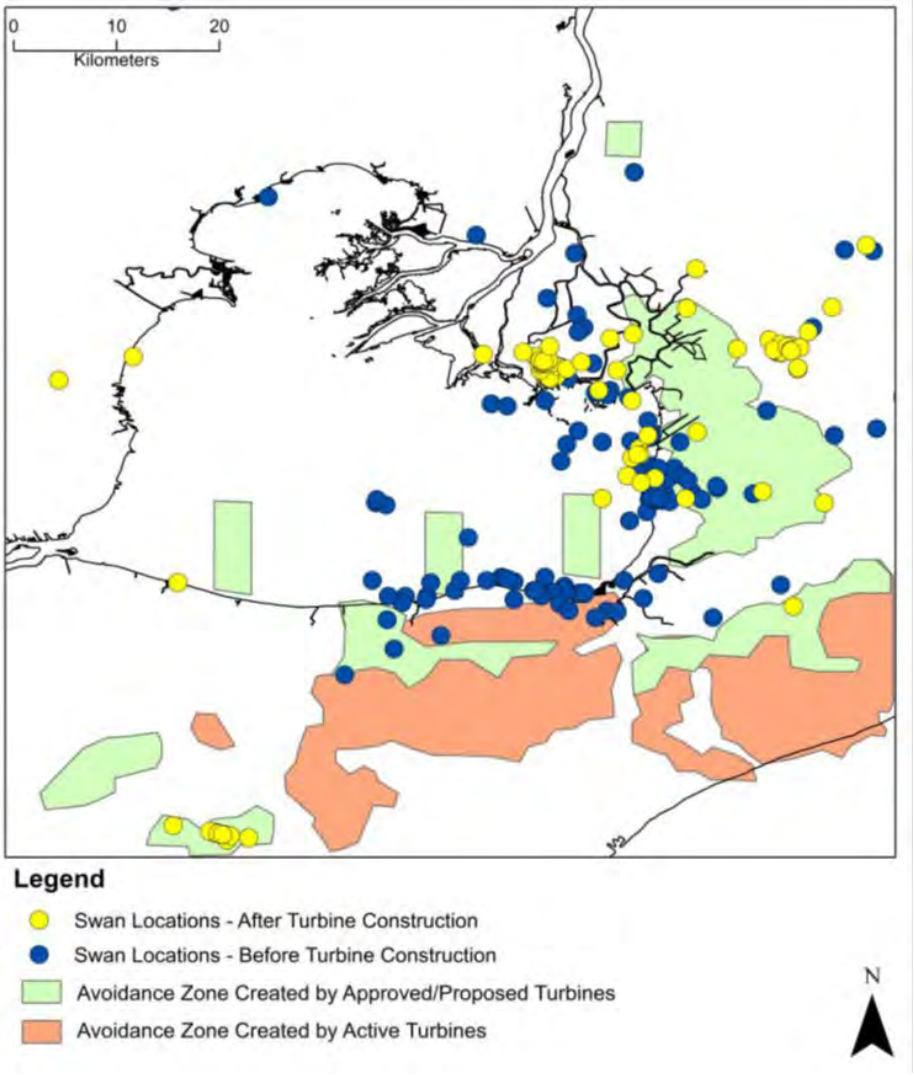

Figure 2. Industrial wind turbine locations paired with Tundra Swan locations at Lake St. Clair, as identified by satellite telemetry units attached to 18 Tundra Swans by Long Point Waterfowl, the USFWS, and the USGS (1998–2014).

in Ontario (Figure 1). Of the 941 IWTs within these two counties, 121 (13%) are located within 5 km of coastal wetlands and 142 (15%) are within IBAs, including within agricultural fields traditionally used by large flocks of foraging waterfowl. When factoring in the 500 m Avoidance Zone created by these IWTs, the constructed, approved and proposed IWTs in Ontario may result in 9% of agricultural habitats becoming effectively unavailable to waterfowl within 8 km of Lake St. Clair (results are specific to the Ontario side of Lake St. Clair). As the majority of these "unavailable" agricultural habitats are along the eastern shore of the lake where waterfowl tend to congregate (Figures 1 & 2), there is concern that construction of these IWTs will reduce food accessibility to field feeding waterfowl that stage and winter in the Lake St. Clair region.

Tundra Swan *Cygnus c. columbianus* telemetry data from Long Point Waterfowl, the U.S. Fish & Wildlife Service (USFWS), and the U.S. Geological Survey (USGS) was used to investigate how IWTs at Lake St. Clair influenced the movements of Tundra Swans in the region. Of 63 birds that were tracked, 18 (29%) spent time staging on the Canadian side of Lake St. Clair. Prior to IWT development (1998–2003), telemetry locations indicated that the tagged Tundra Swans were located across the coastal wetlands associated with Lake St Clair as well as within agricultural fields adjacent to those wetlands (Figure 2). Following the placement of the first phase of IWTs on the south shore Lake St. Clair, all tracked swans were then located on the east side of the lake, several km away from the IWT development (Figure 2). Of the 18 tracked swans that spent time on the Canadian side of Lake St. Clair, only one was at Lake St. Clair both before and after the construction of the turbines. The movement patterns of this swan was consistent with the movements of Tundra Swans in Figure 2, with all but one location on the south side of Lake St. Clair

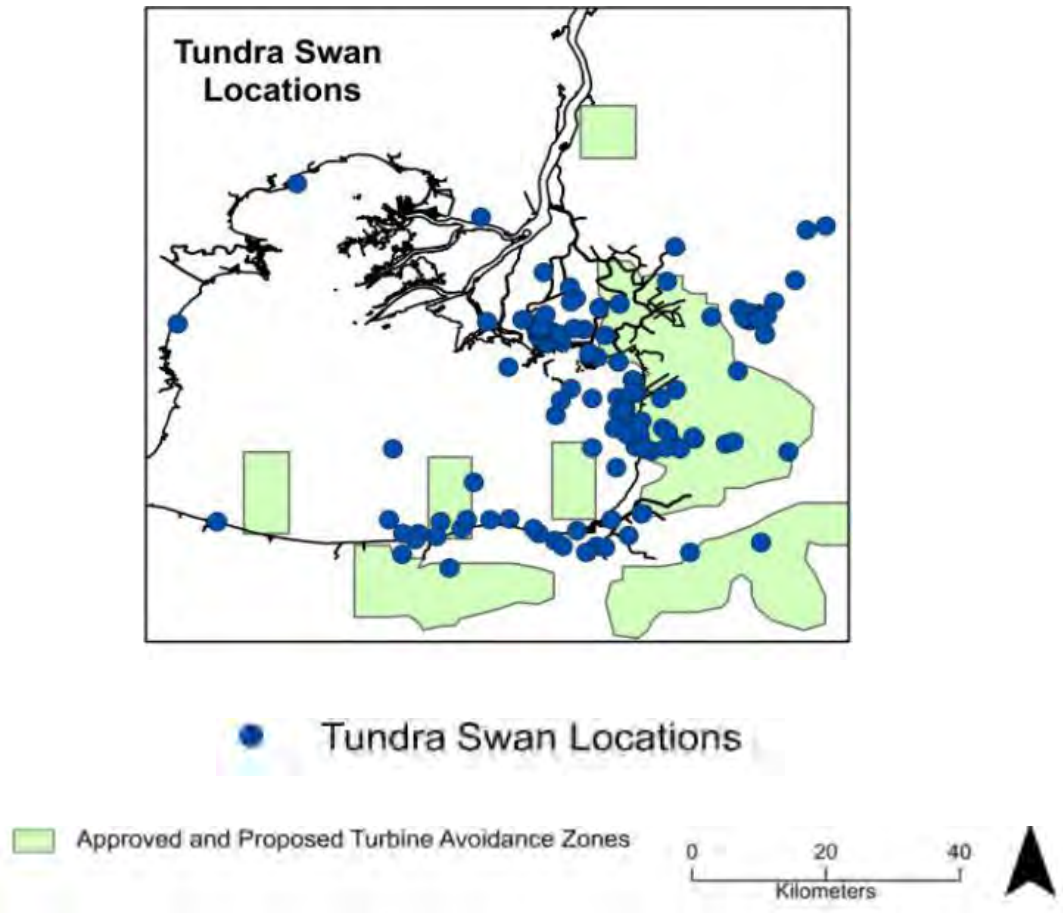

Figure 3. Locations of industrial wind turbines at Lake St. Clair paired with Tundra Swan locations obtained from telemetry data obtained by Long Point Waterfowl, the USFWS and the USGS (1998–2015). Turbine avoidance zones associated with approved and proposed IWTs.

prior to the construction of the IWTs and all movements on the eastern edge of Lake St. Clair following construction. Tundra Swan displacement patterns at Lake St. Clair are in keeping with European studies that have identified IWT avoidance by waterfowl.

Satellite telemetry data was also used to pair waterfowl locations with the location of constructed, approved and proposed IWTs at Lake St. Clair (Figure 3). Because of Lake St. Clair's importance to waterfowl and the potential threats posed by onshore and offshore IWTs, it was important to identify areas where IWT development overlaps with waterfowl habitat use. Based upon movement patterns of tracked Mallards *Anas platyryhnchos*, Tundra Swans and Lesser Scaup *Aythya affinis*, it appears that IWT development along the eastern edge of Lake St. Clair and the suggested placement of offshore turbines would cause a major displacement of waterfowl at Lake St. Clair (Figure 3). This is problematic given the international significance of Lake St. Clair for waterfowl, the fact that most coastal wetlands have already been drained or degraded, and the continued declines in agricultural grain availability within the region. Further studies should be conducted to determine the impact of IWTs on breeding, staging and wintering waterfowl in Ontario.

Editor's note

Excerpted with permission from: Weaver, K. H. A., S. A. Petrie, S. E. Richman, M. D. Palumbo, M. E. Dyson, P. Briscoe and T. S. Barney. 2015. *Waterfowl and wetlands of the Lake St. Clair region: present conditions and future options for research and conservation*. Long Point Waterfowl, unpublished report. 134 pp.

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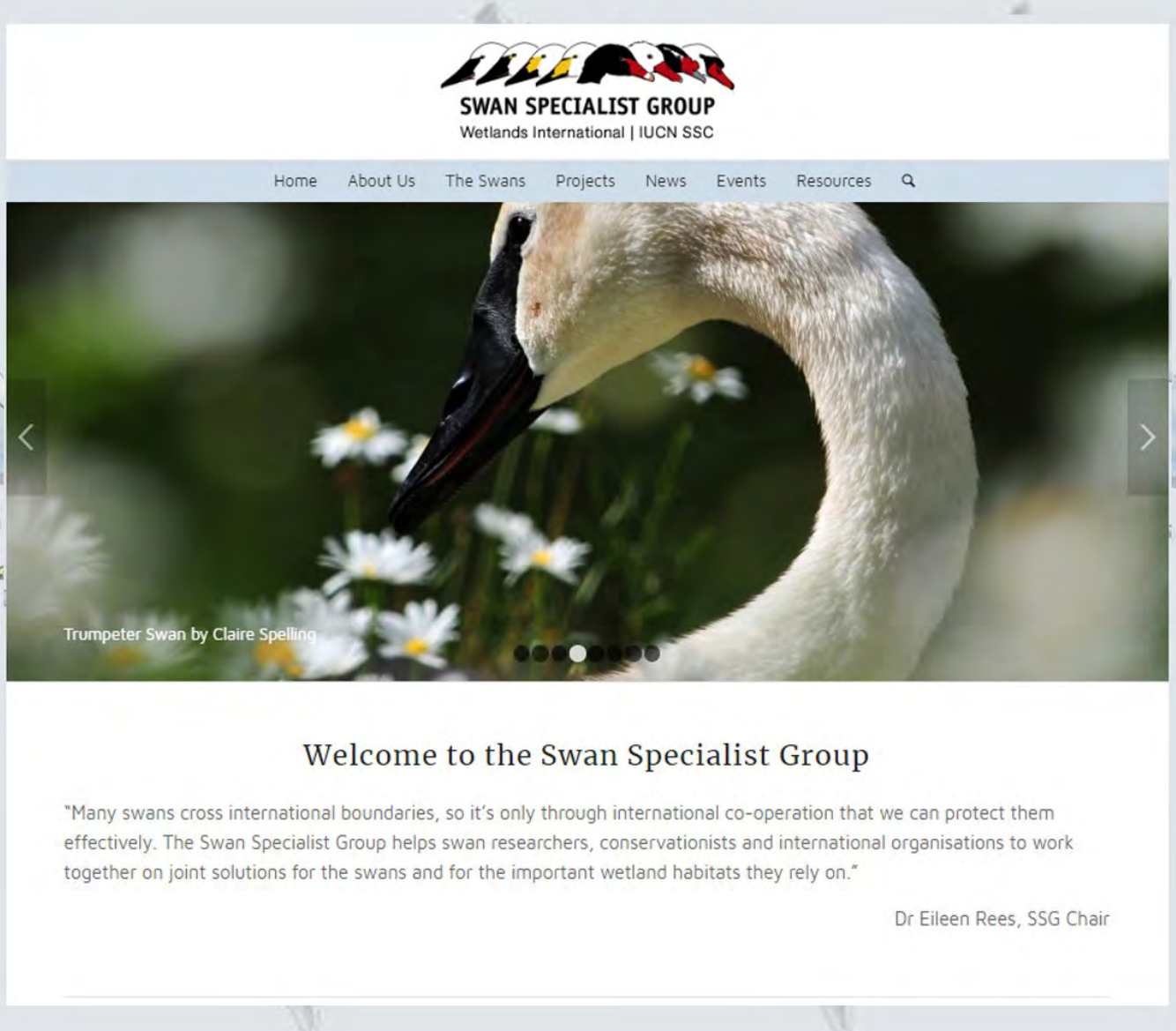

Wetlands International / IUCN-SSC Swan Specialist Group website launched

Julia Newth & Nathan D'Costa

We are very pleased to announce the launch of the first Wetlands International-IUCN / SSC Swan Specialist Group website. We hope that the website will provide a platform to facilitate effective communication between members and others with an interest in swan conservation and management world-wide.

Please visit the website at: **http://www.swansg.org**.

Please also send information on any projects you are working on, news you would like to share and forthcoming events of interest to the swan community. Ideally, articles should be no longer than 500 words (excluding references) but may link to other websites with further information. Just a few sentences may be sufficient to convey news and to promote events. Please send photos/graphics where possible to make the website more dynamic and engaging - we all love a good photo! We would be grateful if you could minimise the size of files (especially for photos).

The website will only be as good as its content so we are looking forward to hearing from you!

P.S. Please send information to both of us – Julia and Nathan [**Julia.Newth@wwt.org.uk**; **Nathan.DCosta@wwt.org.uk**] by email for uploading to the website – and not to everyone on the SSG forum.

US Department of the Interior legal memorandum changes interpretation of “incidental take” in Migratory Bird Treaty Act

Carl Mitchell

The Migratory Bird Treaty Act (MBTA) of 1918, and subsequent amendments to the Act (including those to implement treaties with Mexico, Japan and Russia), has been one of the guiding documents for avian protection in North America since the early 20th century. Recently, a legal memorandum by the U.S, Department of the Interior has changed a long-held interpretation on what constitutes “incidental take”. The change has profound implications for many migratory birds, including swans, in North America.

For those not familiar with the Migratory Bird Treaty Act, you can find background here: **https://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php**.

The legal memorandum is too lengthy to include in the Newsletter, but can be found here:

https://www.doi.gov/sites/doi.gov/files/uploads/m-37050.pdf.

To get some sense of what this change in interpretation might mean for North America’s migratory birds, an open letter sent by former Department of the Interior and U.S. Fish and Wildlife Service professionals to Ryan Zinke (current Secretary of the Interior) in January 2018 is given over the page.

Editor’s note

The comment period has closed and the change has taken place. It awaits to be seen what the actual impacts are.

Trumpeter Swans (photo: National Park Service, Wrangell-St. Elias National Park and Preserve, Alaska, USA).

Open letter to:

The Honorable Ryan Zinke
Secretary of the Interior
1849 C St., NW
Washington, D.C. 20240

January 10, 2018

Dear Secretary Zinke:

We are all conservation professionals who have formerly served the Department of the Interior, from 1971 to 2017: Deputy Secretaries, Assistant Secretaries, U.S. Fish and Wildlife Service Directors, and Migratory Bird Conservation Chiefs. We are former Senate-confirmed political appointees, of Republican and Democratic Presidents, and we are former career civil servants. We are, each and all, very concerned by the Interior Department's December 22, 2017 announcement of a new legal memorandum (M-37050) reinterpreting the Migratory Bird Treaty Act.

This legal opinion is contrary to the long-standing interpretation by every administration (Republican and Democrat) since at least the 1970's, who held that the Migratory Bird Treaty Act strictly prohibits the unregulated killing of birds. This law was among the first U.S. environmental laws, setting this nation and continent on the enviable path to conserving our natural resources. It was passed to implement the first of four bilateral treaties with countries with which we share migratory bird populations (Canada, Mexico, Japan, and Russia). Its intent, and your obligation in enforcing it, is to conserve migratory bird populations. Therefore, we respectfully request that you suspend this ill-conceived opinion, and convene a bipartisan group of experts to recommend a consensus and sensible path forward. We would be pleased to work with you, involving the public, toward this end.

The Solicitor's opinion takes 41 pages to turn the MBTA's straightforward language — "it shall be unlawful to hunt, take, capture, kill ... by any means whatever ... at any time or in any manner, any migratory bird" (emphasis added) - into a conclusion that the killing of migratory birds violates the act only when "the actor [is] engaged in an activity the object of which was to render an animal subject to human control" (emphasis added).

This is a new, contrived legal standard that creates a huge loophole in the MBTA, allowing companies to engage in activities that routinely kill migratory birds so long as they were not intending that their operations would "render an animal subject to human control." Indeed, as your solicitor's opinion necessarily acknowledged, several district and circuit courts have soundly rejected the narrow reading of the law that your Department is now embracing.

We recognize that, at the margin, reasonable people can disagree about the extent to which prosecutions under the MBTA are appropriate for activities that are not intended to kill birds, but which are reasonably likely, and indeed, quite likely to kill them. That is why, over the course of our collective careers, significant progress has been made in defining the limits of this law through refined interpretations, court decisions, and common sense. Over the years, career professionals and political leadership in the U.S. Fish and Wildlife Service (FWS), the Department of the Interior and Department of Justice have adapted to ensure that the enforcement of this law fairly balances the goal of economic progress with the impact of that progress on bird populations.

Birds are, quite literally, the proverbial "canary in the coal mine." How birds fare in the world indicates how all wildlife and habitat, and by extension human populations, will fare. It is not just poetry that led Rachel Carson to title her seminal work, Silent Spring. All the past administrations for which we have worked have struck a balance and worked diligently and in good faith with industries that had significant impacts on birds, such as oil and gas, coal, electric utilities, commercial fishing, communications, transportation, national defense, and others to reasonably address unintended take. It can be done. In fact, it has been done.

Successes in applying this law to minimize the incidental killing of birds are numerous. For example, we worked with oil producers to ensure that exposed crude oil waste pits were covered with nets to keep birds from landing in them. We worked to improve the techniques of commercial fishing to reduce the drowning of seabirds in fishing lines and nets. Additionally, government has used the law to work with wind energy companies to improve the siting of turbines to avoid and minimize the killing of birds. It has never been the goal to entirely eliminate the

unintentional killing of birds, but when we find techniques and technologies that can be used at reasonable cost to protect bird populations, we had a responsibility to do so. Although the proximate reason for the passage of the MBTA may have been to protect migratory birds from unregulated market hunting (we note the absence of oil waste pits and wind farms at the time of bill passage), the ultimate reason was the protection of migratory birds.

The MBTA can and has been successfully used to reduce gross negligence by companies that simply do not recognize the value of birds to society or the practical means to minimize harm. Your new interpretation needlessly undermines a history of great progress, undermines the effectiveness of the migratory bird treaties, and diminishes U.S. leadership.

In a world where connections to nature are becoming ever more tenuous, birds are the wildlife that Americans encounter daily. Whether we are conservationists, birdwatchers, hunters, or just citizens who enjoy the natural world, conserving birds is a common interest. In addition, we must consider how our treaty partners in Canada, Mexico, Japan and Russia will view this new interpretation. Only a few years ago, the U.S. exchanged formal diplomatic notes with Canada reaffirming our countries' common interpretation that incidental killing of birds was prohibited by the treaty.

Just as Theodore Roosevelt declared and demonstrated, we, as Federal officials, endeavored to strike a balance between development and conservation. We recognized that strict liability must be tempered with common sense notions of reasonable foreseeability and readily available alternatives. We are anxious to explore this balance and provide you with an approach that we can all support, and one that will continue the proud record of U.S. leadership in conserving birds.

We await your response.
Sincerely,

Lynn Scarlett
Deputy Secretary of the Interior
President George W. Bush

David J. Hayes
Deputy Secretary of the Interior
Presidents William Clinton and Barack Obama

Nathaniel Reed
Assistant Secretary of the Interior for Fish and Wildlife and Parks
President Richard Nixon

Donald Barry
Assistant Secretary of the Interior for Fish and Wildlife and Parks
President William Clinton

Lyle Laverty
Assistant Secretary of the Interior for Fish and Wildlife and Parks
President George W. Bush

Lynn Greenwalt
U.S. Fish and Wildlife Service Director
Presidents Richard Nixon, Gerald Ford, and Jimmy Carter

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Chief, Migratory Bird Management (1993-99)
Assistant Director Migratory Birds (2003-11)

Jon Andrew
U.S. Fish and Wildlife Service
Chief, Migratory Bird Management (1999-2002)

Robert Blohm
U.S. Fish and Wildlife Service
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Brad Bortner
U.S. Fish and Wildlife Service
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Mute Swan (photo: from Weaver *et al.* 2015, included in “Recent literature”, used with the authors’ permission).

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