

Black swan (*Cygnus atratus*)



- Distinctive ornamental waterfowl species native to southern Australia, introduced to GB around 1791.
- A small but increasing breeding population has become established in GB in recent years.
- Impacts on other swan species through aggression and competition possible as are impacts on native aquatic vegetation through consumption; can cause water quality problems.

History in GB

Originally imported into GB for use in waterfowl collections around 1791, and first recorded breeding in the wild in 1902. More regular introductions have taken place since the 1930s, and in recent years a small but increasing breeding population has become established. A 2009/10 Wetland Bird Survey recorded birds at 75 sites across GB, while more recent surveys as part of the BTO's 2007-2011 Breeding Bird Atlas have revealed possible, probable or confirmed breeding in 109 10km squares and non-breeding birds in a further 151 squares.

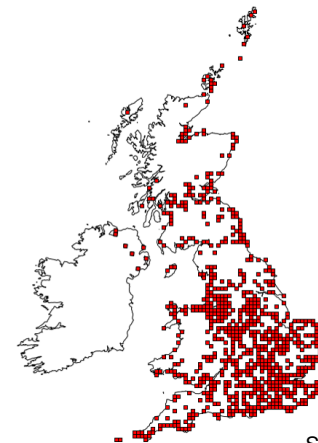
Native distribution

Native to southern Australia, including Tasmania.



Source: NNSIP 2017

Distribution in GB (map shows sightings)



Source: NBN 2017

Impacts

Environmental

- Very aggressive toward other native waterfowl species and may outcompete them for resources.
- Potential impacts on native aquatic plants through consumption.
- Flocks of swans can cause water quality problems.
- Hybridises with several swan and goose species in captivity, but little data on this happening in the wild.

Economic

- In Australia and New Zealand, damage to agricultural crops has been recorded.

Social

- Generally popular with people although can cause problems through aggressive food begging.
- Contribute to trampling and fouling of amenity grasslands.

Introduction pathways

Ornamental - introduced to GB for use in waterfowl collections around 1791, remains very popular in collections today. Individuals enter the wild as a result of escapes or deliberate release.

Spread pathways

Natural - can disperse long distances naturally from captive or feral populations. In GB the winter range of black swan increased from 30 10km squares reported in 1981-84 to 280 10km squares reported in 2007-11.

Summary

	Risk	Confidence
Entry	VERY LIKELY	VERY HIGH
Establishment	VERY LIKELY	VERY HIGH
Spread	INTERMEDIATE	HIGH
Impacts	MODERATE	MEDIUM
Conclusion	MEDIUM	HIGH

Information about GB Non-native Species Risk Assessments

The Convention on Biological Diversity (CBD) emphasises the need for a precautionary approach towards non-native species where there is often a lack of firm scientific evidence. It also strongly promotes the use of good quality risk assessment to help underpin this approach. The GB risk analysis mechanism has been developed to help facilitate such an approach in Great Britain. It complies with the CBD and reflects standards used by other schemes such as the Intergovernmental Panel on Climate Change, European Plant Protection Organisation and European Food Safety Authority to ensure good practice.

Risk assessments, along with other information, are used to help support decision making in Great Britain. They do not in themselves determine government policy.

The Non-native Species Secretariat (NNSS) manages the risk analysis process on behalf of the GB Programme Board for Non-native Species. Risk assessments are carried out by independent experts from a range of organisations. As part of the risk analysis process risk assessments are:

- Completed using a consistent risk assessment template to ensure that the full range of issues recognised in international standards are addressed.
- Drafted by an independent expert on the species and peer reviewed by a different expert.
- Approved by an independent risk analysis panel (known as the Non-native Species Risk Analysis Panel or NNRAP) only when they are satisfied the assessment is fit-for-purpose.
- Approved for publication by the GB Programme Board for Non-native Species.
- Placed on the GB Non-native Species Secretariat (NNSS) website for a three month period of public comment.
- Finalised by the risk assessor to the satisfaction of the NNRAP.

To find out more about the risk analysis mechanism go to: www.nonnativespecies.org

Common misconceptions about risk assessments

To address a number of common misconceptions about non-native species risk assessments, the following points should be noted:

- Risk assessments consider only the risks posed by a species. They do not consider the practicalities, impacts or other issues relating to the management of the species. They therefore cannot on their own be used to determine what, if any, management response should be undertaken.
- Risk assessments are about negative impacts and are not meant to consider positive impacts that may also occur. The positive impacts would be considered as part of an overall policy decision.
- Risk assessments are advisory and therefore part of the suite of information on which policy decisions are based.
- Completed risk assessments are not final and absolute. Substantive new scientific evidence may prompt a re-evaluation of the risks and/or a change of policy.

Period for comment

Draft risk assessments are available for a period of three months from the date of posting on the NNSS website*. During this time stakeholders are invited to comment on the scientific evidence which underpins the assessments or provide information on other relevant evidence or research that may be available. Relevant comments are collated by the NNSS and sent to the risk assessor. The assessor reviews the comments and, if necessary, amends the risk assessment. The final risk assessment is then checked and approved by the NNRAP.

*risk assessments are posted online at:

<https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=51>

comments should be emailed to nnss@apha.gsi.gov.uk

Rapid Assessment of: *Cygnus atratus* (Black Swan)

Author: Dr Dave Parrott

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GB Non-native species Rapid Risk Assessment (NRRA)

Introduction:

The rapid risk assessment is used to assess invasive non-native species more rapidly than the larger GB Non-native Risk Assessment. The principles remain the same, relying on scientific knowledge of the species, expert judgement and peer review. For some species the rapid assessment alone will be sufficient, others may go on to be assessed under the larger scheme if requested by the Non-native Species Programme Board.

Guidance notes:

- We recommend that you read all of the questions in this document before starting to complete the assessment.
- Short answers, including one word answers, are acceptable for the first 10 questions. More detailed information should be provided in the following section.
- References to scientific literature, grey literature and personal observations are required where possible throughout.

1 - What is the principal reason for performing the Risk Assessment? (Include any other reasons as comments)

The Black Swan is a very popular ornamental waterfowl species that has a history of escaping from captive collections and has established small but increasing feral breeding populations in a number of European countries.

2 - What is the Risk Assessment Area?

Great Britain

3 - What is the name of the organism (scientific and accepted common; include common synonyms and notes on taxonomic complexity if relevant)?

Cygnus atratus (Black Swan)

4 - Is the organism known to be invasive anywhere in the world?

An introduced population in New Zealand thrived and came to be regarded as an agricultural pest

(Blair *et al.* 2000). The New Zealand introductions probably started in the 18th century and by the 20th century the population was so numerous and reports of agricultural damage so frequent that the species was subject to a hunting open season.

5 - What is the current distribution status of the organism with respect to the Risk Assessment Area?

During 2004-07, the status was estimated to be a small dispersed feral breeding population (11-16 pairs) and more than 150 individuals UK-wide (Banks *et al.* 2008). During 2006-08, 16-25 breeding pairs were reported annually (Holling & RBBP 2011). In 2009/10 Wetland Bird Survey (WeBS) Black Swans were recorded at 75 sites across GB; the majority of records were of single birds. In Britain, recent surveys for the 2007-11 Breeding Bird Atlas (Balmer *et al.* 2013) reported that during the breeding season there was evidence of possible, probable or confirmed breeding in 109 10-km squares; non-breeding birds were recorded in a further 151 10-km squares (records were mainly in southern and central England). During winter Black Swans were recorded in 280 10-km squares.

6 - Are there conditions present in the Risk Assessment Area that would enable the organism to survive and reproduce? Comment on any special conditions required by the species?

Yes. Extensive waterbodies and wetlands, in which the species breeds (BirdLife International 2012), are numerous.

7 - Does the known geographical distribution of the organism include ecoclimatic zones comparable with those of the Risk Assessment Area or sufficiently similar for the organism to survive and thrive?

Yes. Widely introduced in western Europe largely as an ornamental species. Increasing feral breeding populations in Belgium, The Netherlands, France and Italy (Banks *et al.* 2008).

8 - Has the organism established viable (reproducing) populations anywhere outside of its native range (do not answer this question if you have answered 'yes' to question 4)?

See question 4

9 - Can the organism spread rapidly by natural means or by human assistance?

Yes. Can disperse long distances naturally from captive or feral populations.

10 - Could the organism itself, or acting as a vector, cause economic, environmental or social harm in the Risk Assessment Area?

Yes. Greatest harm is likely to come in the form of environmental/ecological damage. Black Swans are very aggressive towards other swan species and may out-compete them for resources; consumption of native aquatic plants; flocks can cause water quality problems; has hybridised in captivity with several swan and goose species – but few data on hybridisation in the wild (Blair *et al.* 2000).

Entry Summary

Estimate the overall likelihood of entry into the Risk Assessment Area for this organism (comment on key issues that lead to this conclusion).

Response: *very likely (present)*

Confidence: *very high*

Black Swans are present in GB. Ornamental birds discontinuously present in the UK since 1791, and were first recorded breeding in the wild in 1902. More regular introductions took place from the 1930s onwards, and in recent years a small but increasing breeding population has become established (Blair *et al.* 2000; Banks *et al.* 2008). Black Swans were originally introduced into GB for ornamental wildfowl collections from which a number of individuals escaped or were released. Further individuals enter the wild as a result of additional escapes and from feral birds breeding in the wild (remains a very popular collection species).

Establishment Summary

Estimate the overall likelihood of establishment (comment on key issues that lead to this conclusion).

Response: *very likely*

Confidence: *very high*

Black Swans are already established with what is considered to be a small but persistent population. In 2009/10 Wetland Bird Survey (WeBS) Black Swans were recorded at 75 sites across GB; the majority of records were of single birds or pairs; six sites held peak counts of six or more birds. Black Swans are able to breed successfully in the UK, with 16-25 breeding pairs in 2006-08 (Holling & RBBP 2011). WeBS counts suggest that, following a marked increase in the late 1990s, total numbers counted in Britain have since declined and stabilised. The GB population has not yet been considered self-sustaining and so has not yet been added to Category C of the British List (Dudley 2010).

More recently, however, surveys as part of the BTO's 2007-2011 Breeding Bird Atlas have revealed far greater numbers and distribution (Balmer *et al.* 2013). In Britain, the Atlas project has revealed possible, probable or confirmed breeding in 109 10-km squares and non-breeding birds in a further 151 10-km squares; wintering birds were recorded in 280 10-km squares. This compares with recent WeBS estimates of Black Swans present at 66 sites (2009/10: Holt *et al.* 2012).

Population increase has probably been depressed by escaped pairs often seeming to be dominated by the austral breeding cycle (the timing of which varies according to local conditions across Australia). In GB many breeding attempts have failed either with the onset of winter (Blair *et al.* 2000) or due to breeding commencing in winter (Owen *et al.* 2006).

Spread Summary

Estimate overall potential for spread (comment on key issues that lead to this conclusion).

Response: *moderate*

Confidence: *high*

Spread was thought to have been very slow. WeBS records show that since a marked increase in the late 1990s (37-59 occupied sites) the numbers of sites with Black Swans has stabilised and fluctuated between 73 and 90 occupied sites (WeBS reports).

The 2007-11 Breeding Bird Atlas (Balmer et al. 2013) reports, in Britain, an increase in the winter range between 1981-84 (30 10-km squares) and 2007-11 (280 10-km squares); and an increase in breeding range between 1988-91 (1 10-km square) and 2008-11 (260 10-km squares).

This disparity between WeBS and the recent Atlas surveys is consistent with the greater geographical coverage of the Atlas Surveys and the propensity for WeBS to under-record species that are dispersed widely over rivers, non-estuarine coast and small inland waters.

Elsewhere in Europe, the ability for numbers to increase rapidly has been shown in Belgium where numbers increased from around 8 individuals in 1999 to at least 40-45 breeding pairs in 2007 (Banks *et al.* 2008).

Impact Summary

Estimate overall severity of impact (comment on key issues that lead to this conclusion)

Response: *moderate*

Confidence: *moderate*

Black Swans may be aggressive towards Mute Swans or other swan species (Dubois 2007 cited in Banks *et al.* 2008), and this has been recorded in France, Italy and the UK. In France they are also a threat to Greater Flamingos, and have been recorded to disturb their breeding in the Camargue (Dubois 2007 cited in Banks *et al.* 2008). At one site in France where Black Swans had been introduced as an ornamental species they caused problems by being aggressive towards people (Dubois 2007 cited in Banks *et al.* 2008). In Austria Black Swans were controlled because they were causing problems with water quality. Black Swans have hybridised with Mute Swans in Germany and The Netherlands (Banks *et al.* 2008). The large non-native population in New Zealand is known to have negative impacts on biodiversity through grazing of macrophyte communities (Scott 1972). Owen *et al.* (2006) considered the Black Swan to represent a moderate risk to biodiversity if numbers increased.

Climate Change

What is the likelihood that the risk posed by this species will increase as a result of climate change?

Response: *moderate*

Confidence: *moderate*

Climate change (e.g. likely 3°C rise in average global temperature by the end of the 21st century – Huntley *et al.* 2011) is unlikely to be detrimental to Black Swans in GB as the species normally occurs in a climatic zone warmer than that of GB. The native range of the Black Swan is western, eastern and southeastern Australia, Tasmania and southern New Guinea. It was also introduced into New Zealand in 1864, and is now widespread throughout both islands. In GB, climate change has the

potential to enhance the breeding success of Black Swans by promoting increased growth of aquatic plants on which they feed and through advancing and extending the breeding season. In this event, the consequent increase in the rate of population growth and dispersion will increase the likelihood of detrimental impacts, such as aggressive disruption of breeding by neighbouring waterbirds, competition for resources and hybridisation.

Conclusion

Estimate the overall risk (comment on the key issues that lead to this conclusion).

Response: *moderate*

Confidence: *high*

The Black Swan has already entered and established a small but increasing feral breeding population in GB. Although the GB population has increased only relatively moderately (as in most other European countries) the species has shown the ability for more rapid population growth elsewhere in northern Europe (Belgium). Recent reports indicate that the GB population is larger and more widespread than previously thought. With increasing numbers of feral breeding pairs and wild-born birds population growth will gradually become less reliant on future escapes. Currently, there are very few reports of detrimental impacts in GB. If numbers increase more substantially through more successful and widespread breeding (wild-born birds may be less dominated by the austral breeding cycle) then environmental/ecological and agricultural impacts are highly likely to become more frequent and widespread.

Management options (brief summary):

1 - Has the species been managed elsewhere? If so, how effective has management been?

Control measures have been implemented in New Zealand, Austria and in some parts of France (Banks *et al.* 2008). In Austria a population of around 60 individuals had become established in Vienna in the early 1990s, but control measures implemented since the 1990s, including egg management, have removed this population. In Gironde (France) control measures successfully reduced the population from 12 to 4 individuals. These two examples suggest that control measures can be successful with small to medium sized populations of this species (Banks *et al.* 2008). Also, in New Zealand following the imposition of a hunting open season the population quickly crashed until protection was re-established (Blair *et al.* 2000).

2 - List the available control / eradication options for this organism and indicate their efficacy.

Egg control – shown effective (Austria)
Shooting adults – shown effective (New Zealand)

3 - List the available pathway management options (to reduce spread) for this organism and indicate their efficacy.

Egg control to limit natural spread.
Tighter controls on retaining birds in captivity to prevent escape.

4 - How quickly would management need to be implemented in order to work?

The population is currently small and increasing slowly. Populations up to medium-sized are considered to be easily controlled (Blair *et al.* 2000).

References

Provide here a list of the references cited in the course of completing assessment

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