

Reintroduction of *Grus grus* to the UK

A critique of habitat feasibility studies in relation to the reintroduction of the Eurasian/Common Crane (Grus grus) in the UK carried out by The Great Crane Project

01. Introduction

A feasibility assessment details all relevant biological and non-biological factors relating to the proposed reintroduction (IUCN, 2013). Whilst clear and specific guidelines are rare, broader guides are available, such as the IUCN's Guidelines for reintroductions and other conservation translocations (IUCN, 2013). These provide a basic rundown of areas that should be investigated to determine the validity of the project.

It was from these criteria that the feasibility of the reintroduction of the Eurasian Crane to the UK was determined by a partnership known as The Great Crane Project: set up between the RSPB, the Wildfowl and Wetlands Trust (WWT), Pensthorpe Conservation Trust, and Viridor Credits (The Great Crane Project, nd)



02. Objective

'...to raise and release the chicks in south- west England, boosting the UK crane population by enough that they might one day be a permanent feature of our landscape (RSPB, nd).

03. Background

Eurasian or Common Crane (*Grus grus*) was extinct in the UK for 400 years due to human predation, wetlands being drained to grow crops (WWT, nd), and a negative view towards 'crane-ploughing' on farmland (Valkó, et al., 2022). Previous reintroduction projects were unsuccessful as cranes breed slowly so the group sizes remained small. TGCP was set up with the vision to boost the UK crane population by enough remain and sustain themselves (RSPB, nd). The aim also carried the scope of using the common crane to help both conserve remaining wetlands and possibly enhance or produce more across the UK (WWT, nd). This would be to both support their development and also to increase biodiversity in the country.

04. Feasibility

A feasibility assessment should detail all relevant biological and non-biological factors relating to the proposed species reintroduction (IUCN, 2013). Whilst clear and specific guidelines for all feasibility studies are rare, broader guides are available, such as the IUCN's Guidelines for reintroductions and other conservation translocations (IUCN, 2013), utilised and outlined below.

Basic Biologic Knowledge: Necessary knowledge of any translocation candidate species should include its basic biology (IUCN, 2013). Observation carried out in the UK and Europe showed the dietary requirements, along with seasonal behaviours and vulnerabilities (The Great Crane Project, 2022). They also documented them as forming monogamous breeding pairs, producing small clutches of 2-3 eggs (of which only 1 chick would usually reach maturity), and pairs would breed a maximum of twice per year (UK Crane Working Group, 2012).

Founder Source: Where the original species is extinct the closest genetic alternative must be used. Similarly, translocated species can carry pathogens not present in the designated site. To circumvent this, eggs were chosen rather than birds, and were selected from approved nests in Germany with no genetic difference (Blahy, 2021).

Climate Requirements: Historical records were scarce, though evidence showed cranes were present year-round in the UK (Redondo, 2017). This was confirmed by a small number recorded around the Norfolk area (Norfolk Cranes, 2021). As cranes in the UK don't migrate for the winter, it became apparent that winter roosts would be required to support them during the colder months (The Great Crane Project , 2022). These were installed at the Somerset site and later near the wild population in Norfolk.

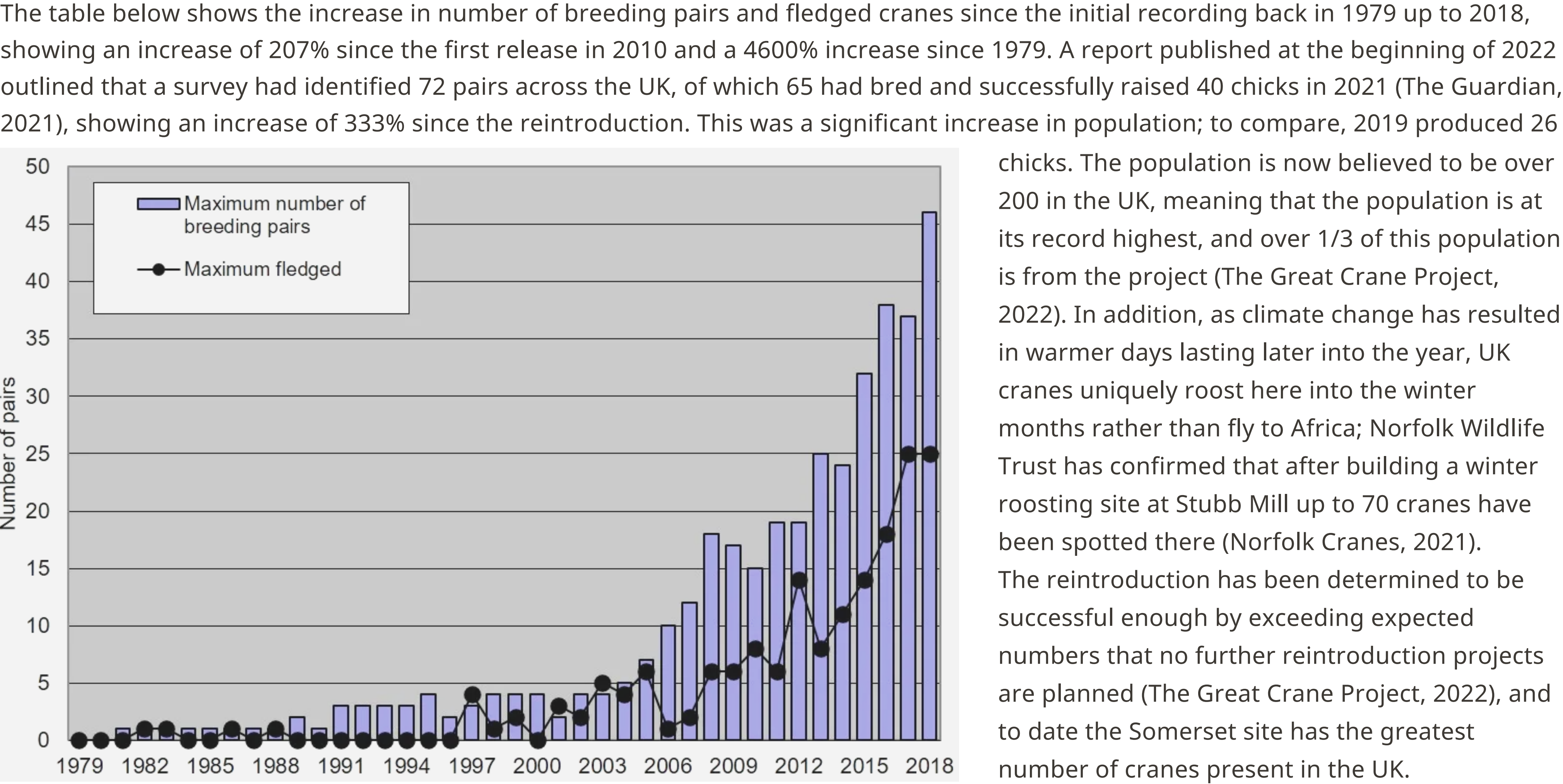
Habitat Requirements: The primary habitat is wetlands, though they are quite adaptable within this environment (RSPB, nd). Studies have shown that they require roughly 100-150ha per breeding pair where multiple pairs are in closer proximity, whereas single pairs have been shown to use up to 900ha (Stanbury & Sills, 2012). To limit conflict with farmers from 'crane-ploughing', a requirement for habitat was to be at least 500ha from farmland (Blahy, 2021). It was decided that land owned at the Somerset Levels & Moors would be most suitable as a site as it made up over 60,000ha of wetland and other suitable environments (WWT, nd). The Somerset Levels were also chosen because of their diversity in invertebrates; they have extensive habitats suitable for nesting, of which there is regular control and maintenance; there is a large amount of land owners under environment agreements, and the area is approximately 250 km away from the existing crane populations with surrounding areas where colonisation could occur (Redondo, 2017).

Animal Welfare: An issue was chick behaviour; dur to aggression they needed to be raised separately. To ensure maximum survival rate, a purpose-built facility was built so they could be reared individually before being introduced at 10 weeks of age (RSPB, nd).

Social Feasibility: Another challenge to the project was the need to reduce interaction with humans; it was vital for the chicks to have the same instincts as wild birds. As the selected location was remote, the possibility of human disturbance was low. However, cranes are intelligent and social birds (outside breeding season), so to counter the possibility of imprinting during development, the rearing team would wear long grey costumes to disguise themselves (RSPB, nd).



05. Results



06. Conclusion

With over 200 confirmed individuals in the UK since the project's pilot ending in 2015 it can be concluded that the reintroduction has been successful. This was in large part due to the feasibility study correctly determining what would be the most suitable area and habitat to start the project and how probably it would be for cranes to survive in the UK. Similarly with sightings of nesting sites recorded all across the UK it can be confirmed that cranes have adapted well enough to the changing environment in the country to establish in a variety of habitats, and the results of the feasibility study were accurate.



Introduction

The information on this poster highlights the function of a feasibility study in relation to the reintroduction of the Eurasian or Common Crane (*Grus grus*) into the UK. It outlines both the challenges and the efficacy of the study as well as the project as a whole.

The Eurasian Crane

The Eurasian or Common Crane (*Grus grus*) had been extinct in the UK for around 400 years due to a combination of predation by humans (UK Crane Working Group, 2011) and wetlands being drained to grow crops (WWT, nd). They also experienced persecution from farmers- as opportunistic foragers in grasslands, agricultural practices provide a huge expanse of land for them to forage from. The issue then comes from their feeding style, known as 'crane-ploughing', where they remove the vegetation and disturb the soil surface in the search of invertebrates (Valkó, et al., 2022).

Despite these issues, research has found that cranes serve as ecosystem engineers; their feeding practices create open-successional vegetation patches that have been shown to increase biodiversity (Valkó, et al., 2022). These patches are also somewhat easy to map as once established they prefer to use the same areas.

A handful of reintroduction projects were set up from the 70's up until the 90's, but as cranes breed slowly the group sizes remained small. A partnership known as The Great Crane Project (TGCP) was later set up between the RSPB, the Wildfowl and Wetlands Trust (WWT), Pensthorpe Conservation Trust, and Viridor Credits (The Great Crane Project, nd).

The Great Crane Project

TGCP was set up with the vision to '...to raise and release the chicks in south- west England, boosting the UK crane population by enough that they might one day be a permanent feature of our landscape' (RSPB, nd). This was established after a study estimated that the mean time to population extinction based on the existing Norfolk population was 16.7 years (Redondo, 2017). The aim also carried the scope of using the common crane to help both conserve remaining wetlands and possibly enhance or produce more across the UK (WWT, nd). This would be to both support their development and also to increase biodiversity in the country.

Habitat Feasibility

What exactly is a feasibility study? In short, a feasibility assessment should detail all relevant biological and non-biological factors relating to the proposed species reintroduction (IUCN, 2013). Clear guidelines for one are rare and so differ they greatly depending on the scope of the project. As such, they frequently resemble project plans rather than valid assessments of feasibility (AEWA, 2012).

Whilst clear and specific guidelines for all feasibility studies are rare, broader guides are available, such as the IUCN's Guidelines for reintroductions and other conservation translocations (IUCN, 2013). These provide a basic rundown of areas that should be investigated to determine the validity of the project. It was from these criteria that the feasibility of the reintroduction of the Eurasian Crane to the UK was determined.

Basic Biologic Knowledge

Necessary knowledge of any translocation candidate species should include its basic biology (IUCN, 2013). Observation carried out in the UK and Europe showed the dietary requirements, along with seasonal behaviours and vulnerabilities (The Great Crane Project, 2022). They also documented them as forming monogamous breeding pairs, producing small clutches of 2-3 eggs (of which only 1 chick would usually reach maturity), and pairs would breed a maximum of twice per year (UK Crane Working Group, 2012).

Founder Source

In some instances, the original species is extinct, and the closest genetic alternative must be used. Similarly, translocated species can carry pathogens not present in the designated site. To circumvent this, eggs were chosen rather than birds, and were selected from approved nests in Germany with no known genetic difference (Blahy, 2021).

Climate Requirements

As the crane disappeared from the UK 400 years ago, historical records were scarce, though evidence showed they were present year-round in the UK (Redondo, 2017). This was confirmed by a small number recorded around the Norfolk area (Norfolk Cranes, 2021). Cranes in the UK are unique in that they don't migrate for the winter, so it became apparent that winter roosts would be required to support them during the colder months (The Great Crane Project, 2022). These were installed at the Somerset site and later near the wild population in Norfolk.

Habitat Requirements

The primary habitat for the Common Crane is wetlands, though they are quite adaptable within this environment and have been found in bogs, mires, pools within farmland, and alder carrs; as long as there's an inaccessible and secluded nest site, they will fair reasonably well (RSPB, nd). In terms of the size of area required, studies have shown that they require roughly 100-150ha per breeding pair where multiple pairs are in closer proximity, whereas single pairs have been shown to use up to 900ha (Stanbury & Sills, 2012). This variation in range area is not surprising given that they're a migratory species and over time have adapted to live in smaller areas along their flight paths (UK Crane Working Group, 2012).

Due to the potential conflict with farmers from 'crane-ploughing', one of the first requirements for habitat was to be at least 500ha from farmland (Blahy, 2021). This resulted in TGCP assessing existing reserve land possessed by both RSPB and WWT. It was decided that land owned at the Somerset Levels & Moors would be most suitable as a site as it made up over 60,000ha of wetland and other suitable environments (WWT, nd) as opposed to continuing in the Norfolk area, which had a much higher risk of human disturbance and increased mortality rates from power lines.

The Somerset Levels were also chosen because of their diversity in invertebrates; they have extensive habitats suitable for nesting, of which there is regular control and maintenance; there is a large amount of land owners under environment agreements, and the area is approximately 250 km away from the existing crane populations with surrounding areas where colonisation could occur (Redondo, 2017).

Animal Welfare

An issue to the project was the basic behaviour of crane chicks; as they're aggressive with each other, they would need to be raised separately. This resulted in a purpose-built facility being created so that they could be reared individually before being introduced to each other at around 10 weeks of age (RSPB, nd). This ensured that as many chicks as possible would survive.

Social Feasibility

A particular challenge to the project was the need to reduce interaction with humans; it was vital for the chicks to have the same instincts as wild birds, and so not becoming used to human presence was imperative. As the selected location was remote, the possibility of human disturbance was low. However, cranes are intelligent and social birds (outside breeding season), so to counter the possibility of imprinting during development, the rearing team would wear long grey costumes to disguise themselves (RSPB, nd).

Results

A report published at the beginning of 2022 outlined that a survey had identified 72 pairs across the UK, of which 65 had bred and successfully raised 40 chicks in 2021 (The Guardian, 2021). This was a significant increase in population; to compare, 2019 produced 26 chicks. The population is now believed to be over 200 in the UK, meaning that the population is at its record highest, and over 1/3 of this population is from the project (The Great Crane Project, 2022). In addition, Norfolk Wildlife Trust has confirmed that after building improved winter roosting sites at Stubb Mill up to 70 cranes have been spotted there (Norfolk Cranes, 2021). With a target of releasing 100 cranes across 2010-2015 and hitting 93, the reintroduction has been determined to be successful; the huge increase in wild breeding has also exceeded expectations enough that no further reintroduction projects are planned between now and the final review set for 2025 (The Great Crane Project, 2022).

Conclusion

With over 200 confirmed individuals in the UK since the project's pilot ending in 2015 it can be concluded that the reintroduction has been successful. This was in large part due to the feasibility study correctly determining what would be the most suitable area and habitat to start the project and how probable it would be for cranes to survive in the UK. Similarly with sightings of nesting sites recorded all across the UK it can be confirmed that cranes have adapted well enough to the changing environment in the country to establish in a variety of habitats, and the results of the feasibility study were accurate.

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