



Reintroduction of the red-billed chough in Jersey, British Channel Islands

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Introduction

Red-billed choughs (*Pyrhocorax pyrrhocorax*) are specialist invertebrate feeders found in mountain or coastal regions of Europe, North and East Africa, and Asia. The species is listed as Least Concern by IUCN. However, in the British Isles, the population has become fragmented with less than 500 breeding pairs. Choughs died out on Jersey (117 km²), and the other British Channel Islands, at the turn of the 20th century. Changes in agricultural practices and, to a lesser extent, human persecution (egg collecting) led to their demise. *Birds On The Edge*, a multi-partner project, was established in 2010 to restore Jersey's depleted coastland bird populations through management of coastal farmland, and to reintroduce chough, which, as a very visible flagship, will help drive habitat restoration. Durrell Wildlife Conservation Trust manages the reintroduction with a captive-breeding program at Jersey Zoo. Paradise Park (Cornwall, UK) provided the donor stock for breeding (which were originally of wild UK origin) and most of the birds used in the release.

Goals

- Establish a free-ranging population of Red-billed choughs on Jersey, Channel Islands.
- Enhance the survival of the declining north-west European chough population, by re-establishing Jersey's population.
- Use the reintroduction to drive coastal farmland habitat restoration in Jersey.
- Develop the techniques of releasing and managing choughs and other social birds.
- Promote public awareness of coastal restoration and farmland ecology.



Red-billed chough © Elizabeth Corry



Success Indicators

- 30 - 50 chough released over five years.
- 33% survival from release to adulthood (two years).
- A population of at least 15 individuals, including at least one breeding pair, established by end of Year 5.
- In the medium-term (20 years), coastal farmland habitat is restored enough to support a free-living population of choughs with minimal need for supplemental feed.
- Chough ecology data disseminated to stakeholders and practitioners.
- Supportive landowners and residents actively engaged in the conservation of Jersey's coastal biodiversity.

Project Summary

Feasibility: Red-billed chough are sedentary, very poor dispersers and the likelihood of a natural recolonization on Jersey is remote. Historic population sizes in the Channel Islands are unknown. Their demise was in large part due to the removal of sheep in the 19th century which resulted in bracken invading coastal farmland making their main food, soil and dung invertebrates, inaccessible. Conservation grazing began on the north coast using Manx loaghtan sheep in 2009. Feasibility studies concluded this grazing site was the most suitable for the choughs. Durrell's conservation experience, and lessons from a chough reintroduction attempt in the UK, informed this restoration. This was the first licensed reintroduction in Jersey. Staff liaised with the States of Jersey and stakeholders. Perceived negative impacts to farmland crops were assuaged following staff consultation.

Implementation: Jersey Zoo started captive-breeding in 2010. Soft-releases were conducted between 2013 and 2018; where 43 choughs were reintroduced. Birds were released in eight cohorts of 3 - 8 (mean 5.4) replicating normal family group size. The intention was to release chicks shortly after fledging. Low productivity at Jersey Zoo resulted in Paradise Park having to provide sub-adults (1 - 2 year olds, and a four year old) for the initial release. Subsequent releases used juveniles (<6 months old) (60 - 159 days, mean 103 days). There were no releases in 2017. In 2018, three 1 year old males were released to address the sex ratio imbalance. Jersey Zoo developed artificial incubation and hand-rearing techniques, resulting in eight hand-reared chicks released (58 - 71 days old at release).

These birds were held in the release aviary for 15 - 150 days. The aviary was 18 x 8.5 x 3.6 m high, made of semi-circular poly-tunnel hoops covered with nylon netting. At one end a smaller covered area (3.6 x 8.5 x 3.6 m) served as a shelter and service area. The flight was divided in two, with interconnecting doors and hatches, so the birds could be separated if necessary. The birds left and entered the flight via hatches (0.6 x 0.4 m) high up at one end of the flight. They were trained to associate a whistle with food, enabling staff to call birds into the aviary if they need to be re-captured.



The birds first bred in the wild in 2015 in buildings within a working quarry <1 km from the release site. The year before, five nest boxes had been installed along the cliffs at the release site. The birds chose not to use them until 2019 when three were occupied; none fledged chicks. An additional two boxes were placed in quarry buildings in 2017 to discourage



Staff in field tracking chough © Elizabeth Corry

nesting on machinery. One was used and fledged five chicks from three breeding attempts. The other was not used until 2019 and fledged three chicks. Future efforts will focus on understanding feeding ecology, allowing supplemental feeding to be minimized, shifting the birds from a current mixed diet to a pellet diet, and protection of wild nests. Further release, of unrelated birds may be attempted to increase genetic diversity.

Post-release monitoring: Monitoring was undertaken by a Durrell staff member (EC) and volunteers. The public reported sightings to www.BirdsOnTheEdge.org, via social media, or direct to the team. Birds were fitted with colored leg rings and a permanent numbered metal ring. Tail-mounted VHF transmitters were attached for six months, or until first molt. Daily fixes were taken to determine survival, dispersal and foraging habits. Supplemental feed was given daily at the release site. Health, behavior, and life events were recorded into Species360 Zoological Information Management System (ZIMS). Pre-and post-release fecal screening monitored parasite load. Birds with high loads were treated by a veterinarian. In two cases of injuries requiring anesthesia (foot injury caused by ring and lameness), the individuals were transported to Jersey Zoo's Vet Centre for treatment and released that day. Cause of death where known has been starvation ($n = 3$), aspergillosis ($n = 2$), and predation/mortality by Peregrine falcon (*Falco peregrinus*) and Lesser black-backed gulls (*Larus fuscus*) ($n = 2$). In 63% of cases ($n = 19$) cause of disappearance was unknown.

Nesting attempts were monitored. Chicks were ringed at 3 weeks old for those nests that were accessible. Between 2015 and 2019, 18 different pairings, and 36 pair years, produced 36 nesting attempts where eggs are believed to have been laid; 19 (53%) fledged at least one young. In total, 36 young fledged. Excluding chicks hatched in 2019, 70% of the 20 chicks that fledged survived to one year. Clutch size was four ($n = 3$), and mean brood size at fledging of those fledging young 1.9. In 2019, a chick fledged from a natural nest site 5 km from the release aviary. Once the birds survived their first year at liberty survival is high. From 2015 to 2018, during 95 bird years, annual survival was 93.7%. By July 2019,



Jersey's chough population was 48, of which 24 were hatched and reared in the wild, including 13 fledged that year.

Major difficulties faced

- Limited success with captive breeding at Jersey Zoo meant sub-adults were used in the first year which relied on imported birds.
- The design of the aviary was not optimal for socializing birds imported from the UK, since it was difficult to adequately separate and mix birds. Planning laws and landowner prerequisites meant that the aviary had to be a temporary structure restricted in square footage. The operational design and materials used for the release hatches led to management problems. Salt air corrosion and exposure to adverse weather resulted in regular repairs. The choughs learnt how the hatches operated and avoided entering if staff were present.
- Health and Safety regulations at the working quarry created problems during initial releases. A bird refusing to leave the quarry might be in an inaccessible location for staff to provide supplemental food. In two cases this resulted in death by starvation.
- Birds imported from the UK have always tested positive for *Syngamus trachea* parasites. Stress levels due to aviary confinement pre-release elevate the problem. Treatment was successful in all cases pre-release. Once released, treatment depends on the ability to recapture an individual. One individual that tested positive, and evaded capture, was preyed by a Peregrine falcon. In 2017, all four wild-reared chicks tested positive at or soon after fledging. Two were trapped in the aviary, treated, and survived. Two evaded capture and died.

Major lessons learned

- Greater success is achieved by releasing choughs under six months of age. The one year post-release survival for birds released <1 year old was 25 out of 30 (83%) with the loss of three occurring after living free for more than six months. Survival of birds released at ≥1 year old was 8 out of 13 (63%) with four losses occurring less than three weeks post-release. The oldest bird released, a four year old male, flew away from the group upon release and was never seen again.
- Hand-reared birds, because they do not fear their manager, are easier to look after, are orientated to the release



Chough aviary © Elizabeth Corry



aviary, and act as anchor for the flock at the release site.

- Supplemental feeding supports the population during times of limited wild food availability. The three birds that died of starvation were recently released birds that became stranded in the quarry and could not access supplemental feed.
- Socialization with siblings or other young choughs is important prior to release for them to learn social and foraging skills; individuals reared alone without siblings are more likely to fail in the wild even if parent-reared in captivity.

Success of project

Highly Successful	Successful	Partially Successful	Failure

Reason(s) for success:

- A year-round hands-on approach to daily management taking adaptive measures when necessary.
- A mix of hand-reared and parent-reared birds in the release cohorts creates a more amenable flock. The hand-reared birds easier to train to return for supplemental food and the parent-reared birds are better socialized to other choughs.
- Supplemental feeding is crucial during the initial release phase and during periods when natural food availability is low and/or food competition is high, e.g. over winter.
- Veterinary support to monitor and treat choughs for Gapeworm (*Syngamus trachea*) and injuries, has increased survival.
- Without stakeholder support we would not have been able to rescue birds trapped in buildings, retrieve bodies for *post-mortem*, monitor roost and nest sites, and access nests to collect data and fit leg rings.

References

Signal, C. & Signal, E. (2011) Supplementary feeding of sub-adult choughs. *British Wildlife* 22: 315-319.

Burgess, M.D., Woolcock, D., Hales, R. & Hales, A.J. (2011) A pilot release of captive-bred red-billed choughs into Cornwall, UK, pp135-140. *In:* Pritpal S, editor. *Global Reintroduction Perspectives*: IUCN.

Burgess, M.D., Woolcock, D., Hales, R., Waite, R. & Hales, A. (2012) Captive husbandry and socialization of the red-billed chough (*Pyrrhonorax pyrrhonorax*). *Zoo Biology* 31(6): 725-735 <https://doi.org/10.1002/zoo.21031>.

Corry, E. (2012) Project plan for the reintroduction of red-billed chough *Pyrrhonorax pyrrhonorax* into Jersey, Channel Islands. Durrell Wildlife Conservation Trust.

Dobson, R. (1952) *The Birds of the Channel Islands*. Staples Press, London.