

Response to SNH's Scientific Advisory Committee (SAC) Review of the SNH Licence for 'Strathbraan: removal of ravens'

Summary

- 1. The SAC review of the Strathbraan Community Collaboration for Waders (SCCW) trial project involving the removal of ravens is acknowledged. The review is thorough, clear and helpful. The support for mitigation management to quantify the impacts of predators on wader populations; and advice given on improving the methodology, and wider adaptive management are noted. The SCCW has voluntarily opted to cease the removal of ravens by the end of July.**
- 2. SNH proposes to work with a group of SAC members, staff in the British Trust for Ornithology (BTO) and Game and Wildlife Conservation Trust (GWCT), to form a Scientific Advisory Group to advise the SCCW to ensure that further work can have as much scientific rigour as is appropriate. Any further removal of ravens would be licensed when a suitable methodology is in place.**

Background

- 3. In April 2018 SNH issued a licence for the control of northern ravens (*Corvus corax*) to the SCCW as a trial to look at the potential impacts of control on the conservation of wild birds, particularly curlew (*Numenius arquata*), lapwing (*Vanellus vanells*) and Eurasian golden plover (*Pluvialis apricaria*). The proposal was for the removal of around 40% of the non-breeding local raven population from an area of circa 290 sq.km. This equated to a maximum of 69 birds in 2018. The licence was granted on April 4 2018 and ran until 31 December 2018 and the applicant intended to seek renewal of the licence for a further two years.**
- 4. The study was termed an 'adaptive management' trial in keeping with the published [Understanding Predation Report](#) and work being taken forward under the collaborative 'Working for Waders' initiative <https://www.moorlandforum.org.uk/working-for-waders>. The licence was issued to a local community group of land managers and conservationists.**
- 5. The Board commissioned its SAC to undertake a review of the SCCW trial work, and to report within a month of its meeting (met on 28th May 2018). It requested the SAC to review how the licence to remove ravens at Strathbraan in spring 2018 'fits with the wider work on adaptive action to save waders and to report on whether the methods agreed for this trial fit with the wider body of work underway'.**

Terms of Reference

6. In line with the Board's commission, the following Terms of Reference were set and agreed, against which the SAC made its findings:
- i) How the proposed trial fits within the existing knowledge-base around wader conservation and factors affecting wader populations
 - ii) The rationale for selecting ravens for removal, noting other drivers of change in wader populations
 - iii) The proposals and monitoring methods to inform the impacts of raven removal on wader numbers and productivity, and the baseline data and information informing this
 - iv) Consideration given to the impacts of removal on the raven population locally, and nationally
 - v) How the information gathered can be used to best effect to inform future work on wader conservation through Working for Waders
 - vi) Whether, bearing in mind the community-led and adaptive nature of this proposal, there are any modifications that can be made to how the work is carried out in future in order to improve the value of any data collected, and the wider scientific impact of the work.

The SAC reported to the Board (Annex 1), drawing on the detail of the licence application and its consideration of this (drawn from papers provided, the wider literature and discussions with SNH staff at its meeting). It reported its findings under the six ToR headings.

Response to the SAC report

7. In Summary, the SAC concluded that existing trial methods are scientifically inadequate. However, they 'supported the concept that further work on quantifying the impact of predators on wader populations is desirable, with a view to possible mitigation management' in relation to ravens and the Strathbraan licence. The Committee made a number of recommendations to improve the trial methods associated with the licence.
- 8. The work undertaken by the SAC to address the ToR, and the ensuing advice, is acknowledged. Having discussed further work with the Strathbraan Community, it is proposed that the following course of action is put in place, noting that raven control by the SCCW ceased by the end of July:**
- a) Establish a Scientific Advisory Group of members of the SAC, BTO Scotland, GWCT and SNH to work with the SCCW to develop an amended study design and methodology, as appropriate.**

b) Future raven control under licence will be subject to adherence to an appropriately amended study design and methodology.

9. Summary responses are given to each of the six ToR heading below, with Table 1 summarising principal actions. This will form the basis for the first meeting of the Science Advisory Group to advise on further work by the SCCW. This recognises the value of the work carried out to date in terms of starting to gather data and experience on the ground, and in building collaborative and iterative approaches.

i) How the proposed trial fits within the existing knowledge-base around wader conservation and factors affecting wader populations

SNH acknowledges the support of the SAC for further work in this area in the context of the existing and emerging evidence base on factors driving change in wader populations. Predation is one such factor, and control of predation is an important mitigation. Noting the importance of variation in adult survival in driving changes in productivity and immigration/emigration careful advice needs to be given to the SCCW on the duration of the trial.

ii) The rationale for selecting ravens for removal, noting other drivers of change in wader populations

SNH notes the importance of assessing all factors driving changes in wader populations, including changes in habitat, the range of predators, and other factors potentially limiting populations (such as immigration from other areas). Careful consideration should be given to the location and timing of 'raven removal' and 'control' areas, and the possibility of switching treatments.

iii) The proposals and monitoring methods to inform the impacts of raven removal on wader numbers and productivity, and the baseline data and information informing this

Considerable detailed advice is given in the SAC report on the limitations of the existing methods. SNH sees the involvement of the BTO being key advisers on best practice methods, and supporting appropriate training. The use of nest cameras is likely to assist in providing further evidence on nest and chick mortality.

iv) Consideration given to the impacts of removal on the raven population locally, and nationally

SNH notes the SAC's conclusion that the removal of ravens would have no impact nationally on the raven population, but it could have local impacts. SNH will work with the SCCW to ensure that work is undertaken with the best available data to determine in detail the existing and potential demographics of the raven population. The assessment of the

impacts of the proposal used modelling of demographics in a BTO report (which drew on local RSG data).

v) How the information gathered can be used to best effect to inform future work on wader conservation through Working for Waders

Through the Scotland-wide ‘Working for Waders’ initiative, SNH considers that a fuller founded evidence base can be developed on which to form the basis for further research and management, and work is already in hand to address this (Table 1). As it develops, the partnership approach and further design and methodologies should importantly support the wider implementation of the Working for Waders programme.

vi) Whether, bearing in mind the community-led and adaptive nature of this proposal, there are any modifications that can be made to how the work is carried out in future in order to improve the value of any data collected, and the wider scientific impact of the work.

The SAC report provides detailed advice regarding modifications to the study methodology and monitoring, for example the size of study area, selection of any ‘treatment’ areas, and adoption of statistical power analyses. The Scientific Advisory Group can give careful consideration to each of the areas to ensure that in going forward the revised proposal is as scientifically robust as is appropriate and can effectively contribute to the wider evidence base.

Next steps

- 10. SNH staff have already begun working with the SCCW to discuss further work required. The SCCW, currently supported by the GWCT, has agreed to take forward this work. Through providing further scientific advice SNH anticipates a considerable amount of review work being undertaken over the autumn 2018.
- 11. Some of the immediate work staff have identified to take forward is given in Table 1. SNH will develop proposals on these aspects of work before forming the Scientific Advisory Group to consider and advise on the work in detail.

Table 1. Work already in progress by the SCCW and GWCT in response to the SAC review (with cross-reference to ToR).

<i>Issue</i>	SAC review	Potential mitigation and response	Already agreed with SCCW and GWCT
<i>Data management and survey design (ToR ii, iii)</i>	Lack of adequate control (where no cull)	Establishment of a representative control area. There could, be a raven removal area and a control area in 2019	Yes - agree that a well defined raven removal and ‘control’ area needed

		and 2020, and then switch in 2021 and 2022	
	Verification checks are required as basis for comparing field observations with a more robust baseline	Working for Waders (WfW) to consider the relationship between observation and survey techniques and field testing/validation	Yes, and this is a wider issue for such work, and will work with Working for Waders (WfW) partnership to help facilitate – and support – both within the Strathbraan area and more widely
<i>Counts of wader numbers and productivity (ToR iii, iv)</i>	The number of transects relative to the typical breeding densities of the birds is currently not adequate to achieve statistically meaningful comparisons Frequency of visit does not meet that proposed in application, and would need to be increased to measure productivity	Increase the number of transects and standardise frequency of visit to match observed densities	Yes – although the exact resource implications of this need to be further understood and agreed
	Methods for assessing productivity	Looking to combine the systematic process of assessing density with assessment of productivity i.e. focus on the transects	Yes – although this will be enhanced through the use of nest cameras (to determine the predators and impact) and assessment of fledging success
<i>Raven numbers and distribution, and selection of raven ‘cull’ areas (ToR ii, iii, iv, vi)</i>	No allowances for repeat counting of the same individuals or proximity to nest sites (potentially resulting in multiple	Clarify location of breeding pairs. Continue to work through how best to differentiate between breeders and non-	Yes – breeding pairs have already been mapped (and these data need to be confirmed in consultation with

	counting of some birds), seasonality of breeding season, and presence of non-breeding as distinct from breeding birds	breeders Monitor the impact of the cull on Raven population locally, through ensuring no change in occupancy of raven nests, but a reduction in numbers of non-breeding ravens (typically in small groups)	local Raptor Study Group). Standardised methods to reduce the potential for double counting are now in place. WfW and wider membership should be able to help further with this.
<i>Relative impacts of different predators (ToR i, ii)</i>	Relative impacts of ravens and other predators	Quantify the impacts of ravens and other predators (e.g. using nest cameras)	Yes - although the specific methods of how are yet to be worked up, but will involve nest cameras.

12. Other issues have still to be discussed with the SCCW, and will be discussed in detail with the Scientific Advisory Group.

- The Committee questioned the seasonality of the raven cull and questioned whether late winter control may be more beneficial from a scientific perspective (this is because ravens can nest in mid-winter, and therefore non-breeding ravens could be removed from then onwards).
- The Committee questioned the lack of inclusivity within the project, recognising the availability and value of other available data (e.g. Raptor Study Groups, (RSGs) which in their view would be helpful to build in to this approach (noting that RSG members have monitored ravens and other predatory birds over many years in the area, and will have knowledge of non-breeding ravens' habits and habitat use).

The Science Advisory Group working with the SCCW will comprise at least two SAC members, BTO, GWCT and SNH staff. It will meet in the summer to consider in detail the advice it can give the SCCW.