

# **Report on the Welfare of Beavers in Scotland Scottish Animal Welfare Commission**

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## **1. Introduction**

The Scottish Animal Welfare Commission (SAWC) was established by the Scottish Animal Welfare Commission Regulations 2020, made under section 36 of the Animal Health and Welfare (Scotland) Act 2006. The function of providing advice on the protection of wildlife under section 23 of the Wildlife and Countryside Act 1981 has been assigned by Ministerial declaration.

Further information on the Commission, including reports and minutes of previous meetings, is published when available on the [SAWC web page](#).

SAWC's terms of reference are to focus on the welfare of wild and companion animals in Scotland while also providing scientific and ethical advice to the Scottish Government. The Commission will only consider areas that are within the normal current remit of the UK Animal Welfare Committee and the UK Zoo Expert Committee where these relate to the overall responsibility to consider the welfare needs of sentient animals in all areas of Scottish Government policy or at the specific request of the Scottish Ministers. The Commission will not consider matters that are reserved to the UK Government, including the welfare of animals used in scientific procedures.

The Commission provides written reports and opinions to Scottish Ministers giving practical recommendations based on scientific evidence and ethical considerations on the welfare of sentient animals in Scotland, and the impact of policy on welfare.

## 2. Scope of a review of the welfare of beavers in Scotland

This review aims to investigate and make recommendations on welfare issues associated with the management and control of wild beavers, *Castor fiber*, in Scotland. In particular, it reviews welfare issues related to the licensing of the culling of beavers that are in conflict with landowners and anglers, and the translocation of beavers to other parts of Scotland and the rest of the UK.

The review involved an assessment of published evidence about the impact of beavers on anglers, farmers and other landowners and the numbers of beavers that are licensed for culling each year. Stakeholders were invited to respond to a questionnaire that sought to gain additional information and the points of view of those who work with beavers or who are impacted by their activities. Recommendations are made concerning the improvement of the welfare of beavers in Scotland.

## 3. Background to beavers in Scotland

In 2009 the Scottish Government issued a licence for the trial release (the Scottish Beaver Trial) for five years of beavers at Knapdale, Argyll by the Royal Zoological Society of Scotland (RZSS) and the Scottish Wildlife Trust (SWT) with Forestry Commission Scotland (FCS) acting as a host partner (Gaywood *et al.* 2015). Covert releases on Tayside in the 2000s resulted in the establishment of an unofficial population, which is now spreading and growing. In late 2020/early 2021 field surveys were used to estimate the beaver population on Tayside as approximately 954 individuals (range 602 - 1381), with beavers spreading south into the Forth catchment, Fife and Kinross including Perth city centre (Campbell-Palmer *et al.* 2021) and a much smaller population in Knapdale (Dowse *et al.* 2020). The beaver was recognised as a protected native species by the Scottish Government on 1 May 2019, including the unofficial Tayside population. As beaver populations continue to grow, they will require management to prevent economic loss to landholders and fisheries. Management of beaver populations may involve non-lethal and lethal methods, both of which have implications for beaver welfare. In 2020 87 beavers were culled under licence in the Tayside population (NatureScot 2021). There is no indication of attempts at non-lethal mitigation in any of these cases and none of the culled beavers was made available for post-mortem examination.

There are several welfare issues associated with the management and control of beavers including:

1. Inappropriate firearms or their usage may result in inexperienced killing of beavers, which may result in wounding of animals that do not die immediately.
2. Licences to cull beavers are supposed to avoid the kit dependency period from April to August, but may be issued in exceptional circumstances. There is a concern that dependent young may suffer, if their parents are killed in this period and social groups may be adversely disrupted by *ad hoc* killing of beavers from a colony.
3. It is unclear if landowners are attempting non-lethal control measures to prevent damage before resorting to culling that could increase the frequency of issues in 1. and 2.

4. Trapping, moving and releasing beavers into new areas can also affect the welfare of beavers, including any dependent young that might be left behind.

## Introduction

The Eurasian beaver, *Castor fiber*, is a native species that was once found in suitable habitats throughout mainland Britain. Destruction and fragmentation of habitat and hunting for fur, meat and castoreum (a secretion that may have medicinal properties similar to aspirin) resulted in the extinction of the beaver in Britain by around 400 years ago (Kitchener and Conroy 1997), although archive evidence suggests that it may have survived in Yorkshire until the late 18<sup>th</sup> century CE (Coles 2006).

Beaver populations in western Europe were also mostly eradicated through similar human impacts, but relict populations survived in Sweden, the Elbe River in Germany, and the Rhone River in France by the end of the 19<sup>th</sup> century. More than 100 translocations and reintroductions of beavers have taken place in continental Europe during the 20<sup>th</sup> and early 21<sup>st</sup> century so that populations have largely recovered (Halley *et al.* 2020; Wróbel 2020). There have been frequent calls for the reintroduction of beavers to Britain over the last 50 years with some dissenting from this view (Macdonald *et al.* 1995).

The Scottish Beaver Trial carried out intensive monitoring of the beaver population at Knapdale including their impact on the local ecology (Gaywood *et al.* 2015). Subsequent surveys revealed that the illegally introduced population in Tayside was much larger than expected (433 beavers (range 319- 547) in 2017/2018) (NatureScot 2020.), but the Scottish Government chose to tolerate this population and monitor its continuing growth and spread by establishing the Tayside Beaver Study Group, which also aimed to resolve conflicts with land uses in the area. The Beaver Salmonid Working Group was established in 2009 as a sub-group of the National Species Reintroduction Forum to review the existing evidence for potential positive and negative impacts on salmonid fishes and potential management issues and in particular the impact of beaver dams in preventing migration of salmonids at critical life stages (Beaver Salmonid Working Group 2015).

The Eurasian beaver is listed on some annexes of the *Council Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora* (the so-called *Habitats Directive*), which is given legal effect in Scotland in the *Conservation (Natural Habitats, &c.) Regulations 1994* (as amended), commonly referred to as the *Habitats Regulations* (Gaywood *et al.* 2015). The Habitats Directive gives strict legal protection to beavers, and their breeding and resting sites. Following the conclusion of the Scottish Beaver Trial and a report to the Scottish Government (Gaywood *et al.* 2015), beavers from both populations were recognised as a European Protected Species on 1 May 2019. However, derogations under Article 16 of the Habitats Directive are permissible to allow management of beaver populations where these conflict with human activities provided that (Pillai *et al.* 2012):

- there is no satisfactory alternative;
- they are not detrimental to the maintenance of the species at a favourable conservation status in their natural range; and

- the grounds for the derogation fall within the categories listed in Article 16(1). Reasons for issuing derogations for killing beavers include the need to protect wild fauna and flora and conserve natural habitats, prevent serious damage, e.g., to crops, livestock, forests, fisheries, water, and property, or in the interests of public health and safety or other imperative reasons of public interest, including social and economic, or impacts on the natural environment (Pillai *et al.* 2012, Gaywood *et al.* 2015).

The Knapdale population continues to develop slowly, probably given the limitations for its spread from there into adjacent areas, but it is supporting ecotourism for those wishing to see beavers in the wild, which is estimated to generate monetary benefits locally of £1.059 to 6.698 million during the Scottish Beaver Trial (Gaywood *et al.* 2015). However, the rapidly growing population on Tayside is causing continuing conflicts with landowners, including flooding of crops, damage to river banks and drainage infrastructure, and loss of trees. Anglers are also concerned at the loss of suitable breeding habitat for salmonid fishes and the impact of beaver dams on fish migration. This is especially important for the Atlantic salmon, which is declining due to a variety of factors.

Although both non-lethal and lethal methods for controlling beaver activities or their numbers are available, there is widespread public concern about the culling of beavers under licence. Conservation and welfare organisations have called for more use of non-lethal methods of control, including translocation to other sites in the UK, but these are not without welfare concerns.

As a result of these concerns, in June 2021 Trees for Life sought a Judicial Review, against NatureScot on five counts, including issuing too readily licences for beaver lethal control in apparent contravention of the beaver's status as a European Protected Species and without giving reasons for the issuing of those licences. In October 2021 Lady Carmichael, the judge who considered the review, upheld only one of these complaints, i.e. NatureScot did not publish the reasons for issuing of licences ([2021csoh108.pdf \(scotcourts.gov.uk\)](#)). NatureScot committed to revising their licensing approach in accordance with the Court's ruling. Following this ruling in November 2021 the Scottish Government announced a change in policy to allow for actively promoting translocation of beavers within Scotland to expand their population outside their current range. NatureScot issued interim guidelines ([Interim guidance on NatureScot support for and assessment of beaver translocation projects | NatureScot](#)) followed by full guidelines ([Guidance - Translocation of beavers in Scotland | NatureScot](#)) for beaver translocations. Since the change of policy a translocation of two beaver families to Argaty Red Kites near Doune, Perthshire, took place in November 2021 and February 2022 ([Argaty second beaver translocation | NatureScot](#)) and FLS is considering ten sites to select three for translocations ([Beavers to be relocated to three new sites in Scotland \(theferret.scot\)](#)).

#### **4. Welfare concerns for beavers in Scotland**

What is the evidence that non-lethal mitigation is tried before requests for licences for culling?

Is the culling method sufficient to minimise negative welfare through e.g., non-fatal wounding and are practitioners sufficiently trained to shoot beavers efficiently? Are other methods available to further minimise accidental injury and suffering?

Are sufficient safeguards in place to prevent dependent beaver kits from experiencing serious negative welfare, such as starvation, by limiting the period when culling is permitted?

One non-lethal method, which also allows for the controlled spread of the beaver population, is translocation of beavers to reduce local population densities. However, the live capture and release of beavers into new areas has several welfare concerns that need to be assessed.



## **5. Evidence gathered**

A literature review was carried out, including guidance and since 2019 annual Beaver Management Reports, provided by the NatureScot website

A questionnaire (Appendix I) was sent to ten stakeholders and replies were received from the following:

Atlantic Salmon Trust (AST; Simon Dryden)  
John Muir Trust (JMT; Mike Daniels)  
National Farmers' Union Scotland (NFUS; Penny Middleton)  
NatureScot (Donald Fraser, Dr Jenny Bryce)  
Roger J Wheeler (RJW; former Chair of the Beaver-Salmonid Working Group)  
Royal Zoological Society of Scotland (RZSS; Dr Helen Taylor and Dr Helen Senn)  
Scotland's Rural College (SRUC; Fiona Howie)  
Scottish Environmental Protection Agency (SEPA; Debbie Wands)  
Scottish Land and Estates (SLE; Karen Ramoo)  
Trees for Life (TFL; Alan McDonnell)

Owing to constraints on time because of the development of the National Beaver Strategy, an online meeting was held with NatureScot, followed by responses to the questionnaire.

## Results

Below is a synthesis of the responses from stakeholders and the literature review. Stakeholders are identified by their initials.

### Economic losses caused by beavers

NFUS and SLE referred to NatureScot as a source of data, TFL did not comment and RZSS sent a summary of published information, which is expanded below. AST indicated that management of dams that prevent upstream passage of adult salmon and sea trout, and downstream migration of smolts is an economic cost for District Salmon Fishery Boards, but did not quantify this cost.

Hamilton and Moran (2015) carried out a survey of the economic losses caused by beavers in the Tayside catchment. 46% of 111 landowners reported no beavers on their land and 17% had seen them, with the rest (43%) seeing signs of beavers or they were unsure if they were present. A minority of landowners (12%) had incurred quantifiable costs that ranged from £300 to £10,000/year (mean £2,653, median £1,000), with higher costs incurred for damaged flood defences and the felling of large trees in the lower (arable) part of the catchment (Hamilton and Moran 2015). They estimated that the total annual cost of damage by beavers in Scotland as ranging from £34,490 to £179,000 across the Tayside catchment, with future losses estimated as ranging between £48,800 to £1,360,000 per year but most probably towards the lower end of the range. However, there are no recent data from the Tay catchment, where beavers have become more widespread and abundant in recent years.

In 2021 Martin Kennedy (NFUS) reported that one farmer lost vegetables to the value of £25,000, owing to flooding of agricultural land on Tayside ([Beavers Re-emerge in Scotland, Drawing Ire of Farmers - The New York Times \(nytimes.com\)](#)), and a Perthshire farmer, Adrian Ivory, reported losses of £4,000/year and totalling £50,000 from flooding of crops caused by beavers and associated labour costs on his land ([Beavers could improve Scotland's water supply, says report \(thecourier.co.uk\)](#)). Hamilton and Moran (2015) recommended that a mechanism be set up for landowners to report damage caused by beavers and its cost, as well as an annual review of the costs and benefits of the presence of beavers, but this has not yet been implemented.

### Use of non-lethal mitigation

NFUS and SLE referred to NatureScot's annual Beaver Management Reports for information about mitigation. TFL also referred to NatureScot for information. Beaver Management Reports record the population development and licensing for lethal and non-lethal control of beavers. However, there are some inconsistencies between years in the reporting of mitigation, so that comparisons are sometimes difficult. Fifteen beavers were trapped under one licence in 2019 for translocation to other sites in the UK, increasing to 31 (2020) and 33 (2021) in subsequent years (NatureScot 2020,2021, 2022). In 2019 there were 20 mitigation projects supported by NatureScot, which aimed to prevent damage and obviate the need for licences to

control beavers (NatureScot 2020). This had increased to 68 projects in 2020 (NatureScot 2021), but no data were given for 2021. An operating budget of £91,000 was set for mitigation projects in 2020, but actual spend was £40,000 owing to COVID-19 restrictions. A budget of £90,000 was set for 2021-2022, but it is not clear whether this was used or not. In 2019 45 licences were issued by NatureScot, of which 39 were for lethal control and five allowed only removal or manipulation of dams without lethal control. All licences, except one, (97.5%) for lethal control were issued to prevent damage to prime agricultural land. Seventeen additional licences were issued in 2020, mostly for prime agricultural land, but also for public safety (5), forestry (1) and mitigation projects (flow devices and exclusions, using fences or grilles; 5). Six of these new licences were for lethal control. A total of 56 dams was removed in 2020. The combined effect of lethal control and trapping for translocation removed an estimated 14.3% and 15.3% of the population in 2019 and 2020 in comparison with an annual population growth rate of 30%.

### **Implementation of non-lethal mitigation**

NatureScot explained that each situation was assessed on a case-by-case basis. The use of flow devices to reduce water levels behind dams can only be used in watercourses with a gradient (or the beavers build dams elsewhere) and are largely ineffective in drainage channels. Damage caused by burrows in banks is hard to detect until significant harm is done, because burrow entrances are often below the water and hence licences for lethal control are more likely to be issued. A technical subgroup is looking at burrow issues, and NatureScot is exploring how increased buffer zones and river restoration approaches can be used in areas where farms are affected by burrowing. NFUS, SLE and RZSS indicated that it is important that mitigation is attempted as early as possible and, where appropriate, mitigation measures should be proactive i.e., should not wait for damage to happen before instigating measures. TFL and AST were unable to respond.

NatureScot stated that it is not always possible to use non-lethal mitigation and NFUS and SLE state that lethal control is only used a last resort when mitigation has been unsuccessful or is not possible. NFUS and SLE also stated that if a wider variety of fully funded non-lethal mitigation techniques were available, land managers would use these instead of lethal control. Both are of the view that if it is known that mitigation does not work in a particular situation, there is no point in delaying lethal control, which could result in increased damage and economic losses.

TFL believe that there should be a clear record of the rationale for licensing any mitigation activity, especially in the case of lethal control. This rationale should be written by a suitably trained and experienced person after they have visited the site at least once to assess the options. Where live trapping for translocation is licensed, this should be given a minimum time-period to be successful before lethal control is considered. RZSS believes that alternative mitigation to lethal control should be attempted first, but realise that each case is different and that any delays caused by attempted mitigation could result in massive financial losses in some cases.

## **Monitoring economic losses and effectiveness of mitigation**

NatureScot stated that licences are intended to prevent serious damage and therefore do not require prior evidence. NatureScot relies on accounts given by applicants for licences and in many cases these are followed up by a site visit by NatureScot staff or experienced contractors. NFUS and SLE indicated that land managers must adhere to several measures prior to licences being issued and both referred to the NatureScot website (<https://www.nature.scot/beavers-licence-forms-and-guidance>). [Guidance - Managing the impacts of beavers in Scotland.pdf \(nature.scot\)](#) TFL referred to evidence submitted to the Judicial Review, which showed that checks are not always made prior to the issuing of licences, nor that non-lethal control was attempted before lethal control was permitted. However, there is often insufficient time to attempt mitigation, where catastrophic damage to crops or infrastructure could occur due to flooding. RZSS stated that checks vary from telephone discussions to topographical GIS modelling, site visits, and issuing licenses for translocation, so that trapping can be attempted prior to culling. RZSS is concerned that this variation in procedure is problematic and raised this issue with NatureScot at a welfare meeting on 22 October 2021. AST was unaware and did not respond.

NatureScot stated that there is an equivalence of evidence with other licensing approaches for other species. Since the Judicial Review NatureScot has revised its licensing procedures and now states the reasons for the issuing of a licence for lethal control. NFUS stated that all existing licences were revoked by NatureScot following the Judicial Review, so that they could be revised with the new conditions and that a thorough investigation, including a site visit, or submitted evidence, is now required prior to issuing of licences. SLE submitted a similar response. Despite this RZSS is concerned that approaches seem to be inconsistent, especially with regard to prime agricultural land, and also transparency regarding what checks have been undertaken and on what grounds before a lethal control license has been issued.

### **Kit Dependency Period**

The kit dependency period runs from 1 April to 17 August each year. Prior to August 2021 licences for lethal and non-lethal control covered the kit dependency period, but existing licences were withdrawn and revised ones were issued to exclude this period. In 2020 there were no applications, and no licensed control or live trapping in the kit dependency period. It is unclear what the situation was in 2019, when the beaver gained legal protection. Since August 2021 it has been necessary to apply for an exceptional licence for beaver control in the kit dependency period, but the latest licensing returns do not mention if any exceptional licences were issued.

NatureScot indicated that there is no open season, but there is licensed control outside the kit dependency period. Licences would only now be issued in the kit dependency period in exceptional circumstances, where risk and welfare are considered. NFUS and SLE recognise the need for a kit dependency period, but also the need for exceptional licences for this period. TFL, RZSS, SRUC also support the

kit dependency period although RZSS is concerned about how this can be policed effectively.

### **Training for use of lethal control**

NatureScot has established an accreditation process that requires controllers to attend a free training course and have firearms certification. The Code of Practice is a condition of the licence and sets out what ammunition is appropriate and controllers must also declare this in their annual returns. The aim of the training and Code of Practice is to ensure that beavers are killed humanely, i.e., to prevent injuries and deaths where welfare is compromised. Training comprises a PowerPoint presentation, detailing various technical aspects of beaver culling, and health-and-safety issues, with a Q&A session. Following training, controllers are issued with a certificate and added to a NatureScot database. There is no test of the marksmanship of the controllers.

NFUS and SLE are confident that NatureScot's Beaver Management Framework has led to the development of a Code of Practice and a comprehensive training programme for accreditation of controllers for detailing how lethal control should be carried out and that welfare is paramount and welfare impacts are minimised. RZSS is concerned about the lack of recovery of culled beavers for post-mortem examination and the lack of regulation on shooting of beavers over water.

### **Lethal control of beavers**

Prior to 1 May 2019, when beavers gained legal protection as a European Protected Species, there was no licensing of the lethal control of beavers and no figures are available of how many were culled. However, the Royal Zoological Society of Scotland carried out post-mortem examinations on 32 Tayside beavers between 2013 and 2019, of which 23 had been shot (S. Girling, pers. comm. 9.11.22). Eighteen of the 23 shot animals were sufficiently fresh to assess the accuracy of the shot; 12 had been shot correctly, but six had been shot poorly such that the welfare of these individuals was probably affected negatively (S. Girling, pers. comm. 9.11.22). Therefore, one third of shot beavers were shot in a way that would not be recommended in current training, but these were shot before that training was available. In 2019, when licences were first issued, 87 beavers were culled. In 2020 this rose to 115 and dropped back to 87 in 2021.

The 2020 Beaver Management Report (NatureScot 2021) stated that five beavers were submitted for post-mortem examinations by SRUC Veterinary Services between June 2020 and March 2021. Three of these had been shot; the causes of death of the other two were not established, but could have been the result of territorial fighting. The placement of the bullet in one of the shot beavers was not in the recommended area for humane dispatch. However, the data are too few to draw any conclusions about welfare aspects related to the shooting of beavers.

RJW was concerned that a comprehensive management plan was not in place that recognised the need for lethal control of beavers, when other mitigations have failed,

and that the current demand for translocation would at best be a temporary respite from the need to have an effective population management plan. RJW stated that no further translocations should occur until a management plan was in place. Once available habitats are occupied in Scotland and the rest of the UK, there does not seem to be any longer-term plan for dealing with future conflicts. RJW also proposed that education, particularly of younger people, is required so that there is a greater understanding of the need for lethal control if other kinds of mitigation are ineffective or inappropriate.

### **Welfare of beavers subject to lethal control**

Welfare has been considered at the population level as well as for individuals. In 2020 NatureScot carried out an analysis of the impact of licensed removal of beavers on population viability and continues to work with the University of Newcastle to model the effects of different management scenarios and their impacts on population viability. The Codes of Practice issued by NatureScot are intended to safeguard beaver welfare, but the numbers of beavers submitted for post-mortem examination are too low to verify compliance. NFUS and SLE are satisfied that the current accreditation scheme with Codes of Practice are sufficient to safeguard beaver welfare, but TFL is concerned that there is no limit to how many beavers can be shot under a licence and RZSS is also concerned that there is a lack of regulation concerning the shooting of beavers “over water”, coupled with a lack of incentive to return culled carcasses for post-mortem examination, which mean that it is not possible to ensure good welfare outcomes in all cases, or ensure that poor welfare outcomes are detected. RZSS is also concerned that the continued culling of beavers at particular locations could act as population sinks that deplete the wider areas of beavers as they continue to recolonise empty territories, which could affect population viability and gene flow. Despite this concern, so far the beaver population has been growing strongly since 2012 with average annual increases of c.30% with culling affecting c.10% of the population since licensing began. Therefore, there is currently no evidence that derogations to kill or translocate beavers are affecting the Favourable Conservation Status of the beaver in Scotland.

NatureScot, NFUS and SLE do not believe that the recent Judicial Review will improve beaver welfare. However, TFL believes that now that NatureScot must provide the reasons behind the decision to issue a licence, the process will be much more transparent and that welfare will be considered more carefully, including the preferred use of non-lethal control. In particular, the change in Government policy since the review to allow translocations in Scotland is important in allowing beavers to become accepted as part of landscapes. TFL would like to see limits on numbers of beavers killed per licence and more beavers retrieved for post-mortem examination. RZSS concurred with these views and hoped that fewer licences would be issued, resulting in less lethal control, but reiterated its concerns about shooting over water and lack of retrieval of beaver carcasses.

## **Post-mortem examinations of beavers**

All respondents (NatureScot, NFUS, SLE, TFL, SRUC, RZSS, AST) support the need for post-mortem examinations on beavers for health and welfare assessments, but that health-and-safety concerns made it impossible to retrieve all dead beavers, although prior to legal protection beavers were readily submitted to RZSS for post-mortem examinations (see above). NFUS believes that it is important that the collection of beavers and post-mortem examinations are impartial, which is the case currently. SLE is concerned that these examinations should not be used to accuse controllers of “wrongdoing”. RZSS is concerned about the low number of beavers submitted for post-mortem examination and that this may be linked to allowing the shooting of beavers over water. RZSS carried out 32 post-mortem examinations on dead Tayside beavers before legal protection in 2019 (S. Girling pers. comm. 9.11.22), which indicated that recovery rates should be much higher than they are today given the much larger beaver population and greater number of beavers that are being culled under licence.

## **Advice on non-lethal mitigation**

NatureScot provides free advice to land managers through the mitigation scheme. There is only one resource currently on the NatureScot website (tree protection; [Protecting trees from beavers using wire mesh | NatureScot](#)), but NatureScot hopes to build up these resources as it develops casework examples. NatureScot has also published guidance on managing the impacts of beavers (“[Guidance - Managing the impacts of beavers in Scotland.pdf \(nature.scot\)](#)”), which outlines mitigation options for landowners, and states which do and do not require a licence. NFUS acknowledged the availability of a NatureScot team and dedicated advisor to assist land managers with mitigation, but feels that the scheme is limited and lacks successful measures to protect agricultural land. NFUS is concerned that in some cases there may not be a viable mitigation option, but its main concern is funding and it would like assurances from NatureScot and Scottish Government that they will provide sufficient funding for mitigation. NFUS and SLE would like to see more technical notes available for different kinds of mitigation on the NatureScot website (see above). SLE would welcome the prioritisation of this work as such guidance is an important tool in supporting land managers and will be helpful in demonstrating how impacts can be managed. SLE commented that the mitigation scheme has been slow to become established and to successfully support the delivery of tried and tested measures. There have also been delays in exploring innovative solutions and insufficient evaluation of implemented mitigations.

## **Translocations**

Led by NatureScot, a National Beaver Strategy (NBS) has been developed with a wide array of stakeholders in 2022, which will provide a framework for considering releases into new areas. NFUS and SLE pointed out that a separate beaver translocation strategy is not required because of the impending NBS, but there needs to be clear guidance for those submitting a translocation proposal and consultation of all those affected by it. However, NFUS does not support

translocation and would rather see the natural expansion of the species' range in Scotland. NFUS is not opposed to live-trapping of beavers, but points out that there are welfare risks associated with it. SLE believes that there should be a sufficiently resourced national mitigation scheme funded by Scottish Government to manage the inevitable conflicts with land managers and fisheries. As part of the NBS, SLE hopes that PAL and other important areas for agriculture, forestry and fisheries are avoided for future translocations. RZSS (and SRUC, TFL) also supports translocation through the NBS and AST would like to see more research on the impact on fisheries before future translocations are carried out.

NatureScot stated that there is now a lot of accumulated experience in carrying out live-trapping for translocation with good success rates. In the 2021 Beaver Management Report two out of 31 beavers died that were being translocated, but these individuals had injuries that may have contributed to their deaths. NatureScot points out that live-trapping provides opportunities for gathering information for use in research on welfare, animal and public health and genetics. NFUS and SLE deferred to those involved in live trapping, but TFL indicated that translocations are well practised in many countries and that welfare risks and safeguards are well researched, although it did not know if further research is required.

### **Welfare of beavers subject to translocation**

RZSS provided a very comprehensive response: "Trapping and translocation can have significant welfare implications and we believe these should be addressed in any translocation licence. We believe that there are significant issues around trapping and translocation of unaccompanied kits. In our view it can be practically very difficult to optimise composition of translocation groups when removing animals from a conflict zone. Seasonal timing of translocation, age of animals, group composition, presence of occupied territories at the release site, time and mode of holding & transportation of the animals and post -release follow-up should all be considered when conducting a translocation (in line with IUCN ([www.iucn.org/content/guidelines-reintroductions-and-other-conservation-translocations](http://www.iucn.org/content/guidelines-reintroductions-and-other-conservation-translocations)) and Scottish guidance ([www.nature.scot/doc/scottish-code-conservation-translocations](http://www.nature.scot/doc/scottish-code-conservation-translocations))). There are currently limited data on the long-term post-release survival of beavers after translocations due to the difficulty of monitoring individuals (i.e., because radio-tagging is very challenging) and this is a gap in our knowledge base. The most comprehensive datasets in the UK come from the Knapdale Beaver Trial and reinforcement, but these have acknowledged limitations. New reintroduction projects should demonstrate that they understand these challenges in advance of being licenced and that they have articulated an exit strategy in advance that clearly defines whether intervention will be conducted in the event of poor animal welfare following translocation. In order to do this properly, it is highly likely that they will require the involvement of a qualified wildlife veterinarian."

### **Further issues**

NFUS remains concerned that the illegal release of beavers on Tayside meant that NatureScot and the Scottish Government are developing policies after the releases



rather than before them. NFUS and SLE recognise that there are proven successful mitigation techniques being used across Europe, but that these are only being slowly developed in Scotland as part of mitigation schemes. Its main concern is more resources and funding for mitigation.

RZSS also supports the need for more mitigation to protect landowners' interests: "Further funding and support to the farming community to trial and install beaver mitigation measures should be provided. This is an issue that has been raised via the Scottish Beaver Forum with particular reference to the water-gate trials in areas such as the Meikle burn in Tayside, which have run into numerous unforeseen delays and are still not in place almost three years after first being promised. Areas such as the Meikle burn are home to a large portion of the landowners seeking lethal control licenses and NFUS contends that if the water gate situation was progressed and finished, the need for lethal control licenses would be reduced." RZSS is also concerned that expertise for translocations is limited in Scotland and that there is a need to build capacity to support the wider spread of beavers in Scotland and the rest of the UK.

AST is not against beaver translocations, but believes they must be licenced, monitored and managed in a way which ensures that the risks to free passage for migratory fish are minimised. Scotland's wild salmon populations are in crisis and AST is very supportive of efforts to increase and protect biodiversity, but does not wish beaver activity to further unnecessarily jeopardise the survival of wild salmon across Scotland's rivers. AST would like to see specific research into the loss of free upstream and/or downstream passage to adult and juvenile salmon and sea trout because of beaver dams, which would ideally be carried out on Tayside.

## **6. Ethical analysis and critical issues**

The main issue is the conflict between the activities of wild beavers in Scotland, which may have a negative impact on farmers, foresters and anglers, who all have legitimate uses of river (and lake) systems and adjacent riparian land. Because beavers are a European Protected Species, resolving these conflicts requires licences for specific actions issued by NatureScot and overall any removals of beavers whether by shooting or trapping, must not affect the Favourable Conservation Status of the species. The seven principles for ethical wildlife control (Dubois *et al.*, 2017) provide a good framework for considering these issues in order to set out a process and actions that can be followed to minimise negative welfare for beavers and provide effective solutions for landowners, foresters and anglers,

1. Can the problem be mitigated by changing human behaviour, design of infrastructure or use of advanced technology?

A variety of mitigation methods have been developed in Europe and North America in order to prevent or reduce flooding and to protect trees. These are detailed in Gaywood *et al.* (2015) with the possible welfare issues affecting beavers, if they are not implemented appropriately. For example, reducing water levels to less than 0.8 metres deep upstream of beaver dams through dam notching, flow devices and dam removal could affect beaver welfare and cause the abandonment of lodges. More

research may be needed as to effectiveness of different non-lethal mitigation techniques in Scotland and more guidance needs to be provided by NatureScot.

2. Are the harms serious enough to warrant wildlife control?

Beaver activities can cause significant economic harm through loss of crops and trees, if non-lethal mitigation is slow or ineffective. In the judicial review Lady Carmichael stated ‘that if serious damage tests are likely to be met it is not necessary to wait until damage has occurred before issuing a licence authorising derogation’. Impact on salmonid breeding and migration could cause significant economic loss to salmon fishery boards and anglers, and impact negatively on salmonid populations.

3. Is the desired outcome clear and achievable, and will it be monitored?

Lethal and non-lethal control of beavers could avert significant economic loss, such as flooding of prime agricultural land. However, waiting to see if non-lethal mitigation is effective or the use of live trapping for translocation might not be achievable before such damage was evident. Continued removal of beaver structures might be too big an economic cost to particular landowners, who are affected by high levels of beaver activity. However, if required, methods of lethal control should allow the welfare of the beavers to be assessed to ensure that control is being implemented appropriately.

Beavers are also of economic and environmental benefit, such as reducing flooding or removing silt from rivers, so that a balanced approach should be taken in assessing the costs and benefits on human activities.

4. Does the proposed method carry the least animal welfare cost and to the fewest animals?

Assuming in cases of lethal control that the licensing requirements are followed, the main concern is whether lethal control is carried out humanely and with checks possible on whether the welfare of affected individuals is not negatively affected. The number of animals killed could be minimised by ensuring that non-lethal methods should be tried first including trapping for translocation. However, live trapping and translocation also risk affecting the welfare of beavers.

The issuing of exceptional licences for lethal control and trapping to remove beavers causing local problems during the kit dependency period would still risk affecting the welfare of beaver kits within burrows and lodges. However, it would be difficult to assess accurately how many kits would be affected.

5. Is control socially acceptable?

It is unknown how socially acceptable lethal beaver control is in Scotland, but there is often significant opposition from the general public when lethal control of other wild species is considered.

6. Is the control part of a long-term systematic management and population monitoring?

NatureScot has published a Beaver Management Framework which sets out clear policy, guidance and actions to balance the needs of beaver conservation and associated ecological benefits with impacts on human land use. NatureScot published annual Beaver Management Reports that detail population censuses and controls on beavers. The National Beaver Strategy 2022-2045 was published on 21 September 2022 and provides a very detailed framework and programme for the development of the beaver population, including the need for population monitoring and lethal control, in Scotland.

7. Is control based on specifics and not on negative labels?

The beaver is a reintroduced native species and does not carry a negative label as a pest, except perhaps by landowners and river users who are most affected by their activities. The licensing system should ensure that lethal control is only used when necessary, such as when it threatens livelihoods and public safety.

## **7. Discussion**

The aim of this report is to address welfare concerns that have been raised with respect to the reintroduction of beavers to Scotland. There has been general concern that for a European Protected Species that perhaps too many beavers are being culled annually to protect economic and public-safety interests and that the act of culling may be compromising beaver welfare through poor use of firearms. Linked with this is the concern that non-lethal mitigation is not being attempted first despite the widespread use of a variety of methods that are used currently in mainland Europe and North America. The welfare of beaver kits may be compromised by the culling of adults during the kit dependency period and translocation may also compromise the welfare of beavers when being trapped, transported and released at new localities.

There were ten responses from stakeholders to a questionnaire that aimed to provide evidence and opinion about these welfare issues. Stakeholders included both landowners, such as NFUS and SLE, as well as conservation organisations, such as RZSS and TFL, as well as NatureScot, which is responsible for the protection of beavers and licensing of their control.

The Judicial Review brought by TFL clarified some aspects of the welfare of beavers and resulted in a change of policy with regard to the translocation of beavers in Scotland. For example, Lady Carmichael concluded that 'that if serious damage tests are likely to be met it is not necessary to wait until damage has occurred before issuing a licence authorising derogation.' This supports NatureScot's approach of issuing licences for some situations, e.g., potential damage to prime agricultural land, without the need to try non-lethal methods. However, following Judicial Review, NatureScot must now provide their reasons for issuing licences for control, which should ensure that welfare of beavers has been clearly considered. Change in Scottish Government policy to allow more widespread translocation of beavers which are causing local problems to other areas of Scotland will reduce the need for lethal

control, but this reduction will only be temporary until all available beaver habitat is occupied in the longer term.

The development of the National Beaver Strategy 2022-2045, published in September 2022, provides a comprehensive plan for the future development of the beaver population in Scotland including welfare issues as follows:

Goal 2 of the strategy covers the translocation of beavers to new areas. Under Objective C, which aims to ensure good practice in translocation population management to safeguard beaver welfare and maximise probability of successful establishment, Action i states: “Create and integrate Standard Operating Procedures to safeguard welfare into all translocation applications, with reference to the review of wild beaver welfare in Scotland being conducted by SAWC (the Scottish Animal Welfare Commission).” Action v states: “Ensure post-release monitoring included in translocation planning (immediately after release and follow-up, including data specifically to allow an audit of the impact of mitigation procedures on beaver health and welfare), in line with existing licensing procedures.”

Goal 5 of the strategy covers the establishment “of systems to support land managers in the development of naturalised riparian networks that can accommodate beavers.” Under Objective A, which aims to develop goal-related best-practice guidance and training support, built on prior experience, Action iv states: “Publish Scottish-relevant protocols covering agreed best practices, which incorporate assessed, practical guidance, with consideration of impacts on other species, habitats, land-use and animal welfare principles.”

Therefore, this report is important in reviewing welfare issues and making recommendations in relation to beaver translocations and management on riparian systems as a basis for further developing and refining translocation protocols, and best-practice guidelines and training related to beaver management for the National Beaver Strategy.

This report has identified some remaining concerns about beaver welfare which require more action, evidence, or future monitoring:

1. Published guidance for non-lethal mitigation is very limited and should be expanded to include all the methods listed in Gaywood *et al.* (2015). NFUS highlighted the need for this guidance, as farmers would prefer to use non-lethal methods, if possible.
2. The potential for exceptional licences for the lethal control of beavers in the kit dependency period means that kits could suffer poor welfare in the future. Although no licences have been issued so far since the new licenses were issued in 2019, it is important that Beaver Management Reports continue to report these data.
3. Lack of recovery of culled beaver carcasses for post-mortem examination means that it is not possible to assess whether beavers are experiencing negative welfare by wounding. Restrictions on when beavers can be shot (e.g., while not in the water) could overcome this problem as well as ensuring more humane killing, e.g., shooting after live trapping. RZSS and TFL were

greatly concerned that current guidance and impacts on beavers could not ensure that welfare is not being affected adversely.

4. While translocations may be preferable to killing of beavers to overcome conflicts, monitoring of the outcomes of translocation are required to ensure that protocols are adequate and are being followed, and to assess outcomes in terms of injuries, mortalities, survival and population development. Careful assessment of reintroduction sites, to ensure that they can support a reintroduced population and its development, spread and connectivity to adjacent populations, will be essential.

## **8. Conclusions and recommendations**

In relation to the further development and implementation of the National Beaver Strategy 2022-2045, SAWC makes the following recommendations based on current evidence:

1. There is an urgent need for comprehensive guidance for landowners and fishery organisations for non-lethal mitigation which does not require licensing, Funding from Scottish Government to support the cost of these measures is required to encourage the use of mitigations.
2. No licences should be issued in the kit dependency period. The lethal control or live trapping of beavers during the period when kits are dependent on parents will inevitably compromise the welfare of those kits. The opportunity to implement licensed control of beavers in anticipation of likely damage to economic interests and public safety should in any case obviate the need for exceptional licensing. However, compensation should be offered to those landowners and river users who might in rare cases be affected.
3. Banning the shooting of beavers in the water would eliminate the problem of poor or difficult marksmanship, which can significantly affect the welfare of beavers. There is a high risk of bullets ricocheting or being slowed down by hitting water, which can result in non-fatal injuries. There may be similar risks when shooting unconstrained beavers on land at distance. Instead, beavers should be trapped alive and released into small transportable enclosures, in which they can be shot safely and humanely. This approach is carried out in Bavaria. Lethal control in this way would allow for recovery of all animals for post-mortem examinations and archiving of samples for research. The data generated from these animals would inform future management strategies and help in monitoring health and welfare in all beaver populations, where lethal control is required.
4. While translocations are welcome as an alternative to lethal control, where possible, it is important that robust protocols are followed by trained operators, release areas are assessed properly, and translocated individuals are monitored effectively to ensure that high standards of welfare are maintained during and after the translocations of individuals.

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## Appendix I – Questionnaire sent to stakeholders

### SAWC – Beaver subgroup

**Overall aim:** To investigate and make recommendations on welfare issues associated with the management and control of wild beavers in Scotland.

**Background:** Since 2009 beavers have been reintroduced to Scotland under licence in a trial at Knapdale, Argyll by RZSS and SWT. Covert releases on Tayside resulted in the establishment of an unofficial population which is now spreading and growing. The beaver was recognised as a protected native species by the Scottish Government in May 2019, including the unofficial Tayside population. As beaver populations continue to grow, they will require management to prevent economic loss to landholders and fisheries. Management of beaver populations may involve non-lethal and lethal methods, which both have implications for beaver welfare. In 2020 87 beavers were culled in the Tayside population. There is no indication of attempts at non-lethal mitigation in any of these cases and none of the culled beavers was made available for post mortem examination.

There are several welfare issues associated with the management and control of beavers including:

1. Previous studies on culled beavers have shown that inappropriate firearms have been used inexpertly to kill beavers, which may result in wounding of animals that die after long periods of suffering prior to death.
2. There is no close season on culling of beavers that are causing damage to livelihoods, although licences to cull beavers are supposed to avoid the kit dependency period from April to August. There is a concern that dependent young may suffer if their parents are killed in this period and social groups may be adversely disrupted by *ad hoc* killing of beavers from a colony.
3. It is unclear if landowners are attempting non-lethal control measures to prevent damage before resorting to culling that could increase the frequency of issues in 1. and 2.
4. Shooting appears to be the preferred method of lethal control, but are other more humane methods available?

The aim of the SAWC Beaver subgroup is to contact all relevant stakeholders in order to:

1. To review the evidence for the kinds of economic damage caused by beavers in Scotland
2. To review the mitigations that are available to address these problems and to see if any are currently implemented
3. To review and gather further evidence on the shooting of beavers in Scotland and its impact on welfare including the training for use of firearms
4. To review evidence on the breeding cycle of beavers in Scotland that could inform the kit dependency period

**Timescale:** 1<sup>st</sup> March to 1<sup>st</sup> June 2021

Evidence:

1. What is the evidence for the type, frequency and scale of economic losses caused by beavers in Scotland in the past five years? Are there any trends in these losses?
2. What is the evidence for the type and frequency of use of non-lethal mitigation to prevent damage caused by beavers in Scotland in the past five years?
3. At what point after damage has been caused by beavers and/or mitigations are attempted are requests for licences to cull beavers made?
4. When licences are issued for culling beavers, are any checks made or evidence supplied to demonstrate damage and economic loss by beavers and failed attempts at mitigation?
5. Are licences issued in the kit dependency period (April-August) for culling beavers?
6. Is training a requirement for all users of firearms who cull beavers? What checks are made to ensure that training has been undertaken and that the firearms used are appropriate?
7. How many beavers have been culled each year in the last five years? How many were submitted for post-mortem examination? How many were killed using an inappropriate firearm or suffered significantly if not killed immediately?

Opinion/recommendation:

8. Do you think the current legislation is sufficient to protect the welfare of beavers in Scotland both individually and at a population viability level?
9. Do you think there is clear advice available for non-lethal control of beavers? Would you welcome clear advice and use it?
10. Do you think the training offered to users of firearms for culling beavers is adequate and licence conditions sufficient to ensure that the welfare of beavers is not compromised?
11. Do you think proof of use of non-lethal mitigations for a specific period should be a condition of issuing licences to cull beavers?
12. Do you think the level of evidence or checks required for the issuing of licences to cull beavers is appropriate?
13. Should all beavers be collected for post-mortem examination to provide evidence on welfare aspects of shooting?

14. Do you support a clear closed season corresponding to the kit dependency period?
15. Do you think Scotland needs a beaver translocation strategy to allow for the reduction of local populations by non-lethal means, which would identify future areas for release within Scotland and the rest of the UK?
16. Do you think welfare issues related to the live trapping and translocation of beavers are sufficiently addressed currently? Is further research required?
17. Do you have any further comments and suggestions concerning the welfare, management and control of beavers in Scotland? Is further research required?
18. Following the judgement from the recent judicial review, do you believe the welfare of wild beavers has been improved in Scotland and if so, how?

## **Appendix II – Membership of the Scottish Animal Welfare Commission**

The Scottish Animal Welfare Commission Members are:

- Professor Cathy Dwyer from Scotland's Rural College and the University of Edinburgh (Chair)
- Dr Harvey Carruthers, veterinary surgeon
- Mike Radford, lawyer specialising in Animal Welfare
- Paula Boyden, Veterinary Director at Dogs Trust
- Professor Marie Haskell, Professor in Animal Welfare Science at Scotland's Rural College
- Dr James Yeates, Chief Executive Officer of World Federation for Animals
- Libby Anderson, policy advisor to OneKind
- Professor Simon Girling, Head of Veterinary Services, Royal Zoological Society of Scotland
- Mike Flynn, Chief Superintendent at the Scottish SPCA
- Dr Pete Goddard, veterinary surgeon
- Dr Andrew Kitchener, Principal Curator of Vertebrates at the National Museum of Scotland
- Dr Ellie Wigham, Lecturer in Veterinary Public Health, University of Glasgow

Full biographies can be found [here](#).

### **Appendix III – Acknowledgements**

The following organisations and individuals provided written submissions to the Commission.

#### Statutory and professional bodies

John Muir Trust

National Farmers Union of Scotland (NFUS)

Royal Zoological Society of Scotland (RZSS)

Scottish Environment Protection Agency (SEPA)

Scottish Land & Estates (SLE)

Scotland's Rural College (SRUC)

Trees for Life

#### Animal welfare

Atlantic Salmon Trust

#### Individuals

Professor Roger Wheater, OBE, FRSE



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